



# GREAT SOUTHERN LAND

THE MARITIME  
EXPLORATION OF  
TERRA AUSTRALIS

*Michael Pearson*



*On the cover*

photo: Port Campbell, Vic.

photograph by John Baker

Department of the Environment  
and Heritage

*The anchors are from the wreck of the 'Marie Gabrielle', a French built three-masted barque of 250 tons built in Nantes in 1864. She was driven ashore during a gale, on Wreck Beach near Moonlight Head on the Victorian Coast at 1.00 am on the morning of 25 November 1869, while carrying a cargo of tea from Foochow in China to Melbourne.*

map: detail, *Chart of Tasman's discoveries in Tasmania.*

From 'Original Chart of the Discovery of Tasmania' by Isaac Gilsemans, Plate 97, volume 4, from 'Monumenta cartographica: Reproductions of unique and rare maps, plans and views in the actual size of the originals: accompanied by cartographical monographs edited by Frederick Casper Wieder, published by Martinus Nijhoff, the Hague, 1925-1933.

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## FOREWORD

Although Indigenous Australians had lived here for thousands of years, for the Europeans it was ‘Terra Australis Incognita’, the great unknown land. Early maps of the world showed a single land mass at the bottom of the world to balance, as one would with a set of scales, the land masses of the northern hemisphere.

Surrounded by an ocean barrier, the voyage from Europe to the world’s only island continent was long and often perilous.

By the 16th century, however, European navigators were risking their lives and their ships to find new maritime routes to the spices and silks of Asia. At the beginning of the 17<sup>th</sup> century Dutch explorers began to uncover the secrets of the Australian continent. Willem Jansz and his crew of the *Duyfken* made history in 1606 by being the first recorded Europeans to set foot on Australian soil at the Pennefather River on Cape York Peninsula. Ten years later, Dirk Hartog discovered and mapped a stretch of the Western Australian coast. By 1618 the first accurate depictions of the coast of the Great Southern Land began appearing on European maps.

From that point on, for more than 250 years, Dutch, French and English navigators continued to discover, chart and expand the world’s understanding of the Australian coastline. The legacy of these intrepid explorers remains with us today, through place names such as van Diemen, d’Entrecasteaux, Cook, La Perouse, Freycinet and Bougainville, reminding us of this great age of exploration, adventure and the race to find new worlds.

*Great Southern Land: The maritime exploration of Terra Australis* was originally written to provide a context for the Australian Heritage Council’s assessment of coastal heritage sites. It is published as part of the Australian Government’s celebration of the 400th anniversary of Willem Jansz’s historic journey in the *Duyfken*. It is an absorbing story of an exciting period of discovery, and I encourage everyone to take a journey back in time, and through this book experience the exploration of our nation.

A handwritten signature in black ink, appearing to read 'Ian Campbell'.

Senator the Hon. Ian Campbell  
Minister for the Environment and Heritage



# INTRODUCTION

The central theme of *Great Southern Land: The maritime exploration of Terra Australis* is the definition and understanding of Australia as a continent through the exploration, study and charting of its coasts. In this study the theme is sometimes summarised as ‘mapping the coastline’. The story includes the separation of an Australian continent from the ill-defined ‘Terra Australis Incognita’, the slow unfolding of the geography of the continental edge, and the conceptual change from ‘the Great Southland’ to ‘Australia’. It also covers the addition to European science of the new genera and species of plants and animals found during coastal scientific survey, which so defined the strangeness of the place in the popular mind; and the process of European settlement and making the coast safe for the vessels carrying out trade between the new settlements and the rest of the world. In more recent times the pursuit of knowledge has expanded outwards to the edges of the continental shelf, for purposes of resource conservation and exploitation, and national control of them.

For the purposes of this study, the information gathered by explorers and surveyors had to be made more widely known and accessible to have had a real influence on the definition and understanding of the continent. Knowledge was of no use unless it was shared and fed into a broader understanding of geography or science. ‘Mapping’ was an act that transferred observed fact to documented record, be it chart or text, and it was a pointless and ineffectual act if others could not access and use the record.

In terms of their traditional cosmology, Aboriginal people believe that they have always been here, so to them the idea of ‘discovery’ is meaningless. The more generally held interpretation is that the ‘discovery’ of Australia occurred tens of thousands of years ago, when Aboriginal people crossed the then narrower straits from Asia and spread southwards to eventually occupy most parts of the continent.<sup>1</sup> So in this study, if the term ‘discovery’ is used at all, it is in the context of the discovery of geographical or scientific facts for European science and commerce, not in the sense of the discovery of previously unknown land (though ‘discovery’ is appropriate for Antarctica and many distant islands).



The Indigenous settlement of Australia and the Torres Strait Islands resulted in detailed knowledge of the geography, plant and animal species on a regional basis within Indigenous communities. However, it is unlikely that this knowledge was conceived of on a continental basis, and it was not transmitted in a form that was readily accessible to Europeans when they arrived. So, except in those cases where Aboriginal people or Torres Strait Islanders informed European explorers, scientists or surveyors about the environment being studied by them, direct Indigenous input into the maritime investigation of the Australian coastline in the context of this study is very limited. Undoubtedly the individual Aboriginals taken on exploration and survey voyages obtained a broader view of Aboriginal people in other regions, and would have conveyed that broader view to their own people on their return, but the expansion of this theme is beyond the scope of this essay. However, the growth and ‘mapping’ of European knowledge of the extent of Indigenous occupation of the continent, of Indigenous lifestyle and resources, and the nature and events of contact between the surveyors and Indigenous people, are all very much part of the story.

The charting and investigation of the geography of the coast is only one, albeit important, aspect of the story of conceiving Australia as a continental entity. In addition to the cartographic and scientific understanding of Australia as a continent, there was also an evolving vision of Australia as a political entity—first as a series of colonies and settlements, then as a unified nation. Similarly there was an evolving commercial perception of Australia—initially as the residual Great South Land that might have wealth worth exploiting, then as a series of British colonies with sea-links between them, and finally as a nation with responsibility for defining and maintaining sea-lanes for growing international and domestic commercial traffic.

Frank Broeze’s proposition that the European settlements around the Australian coast should be seen as ‘an archipelago of “islands” of settlement rather than as a continent’ is an important concept in focusing on the peculiarly maritime nature of the nation’s early history.<sup>2</sup> As Campbell Macknight has clearly demonstrated, the Australian coast can also be thought of in relation to its particular geographic and climatic characteristics, and its particular history of ‘outside’ contact.<sup>3</sup> Macknight’s coastal regions, which seem appropriate in the context of the present study, are:-

1. south-east Australia—the NSW-Queensland border clockwise round to the Eyre Peninsula in South Australia, including Tasmania—the most populous region after European settlement, but with no confirmed external contact, except for two Dutch expeditions in the 17<sup>th</sup> century to the Nuyts Archipelago and Tasmania, until the late 18<sup>th</sup> century;
2. the south coast and west coast, from the Eyre Peninsula clockwise to Broome—a region with extensive arid areas, visited by the Dutch and English from the 17<sup>th</sup> century;
3. the north coast from Broome to Cape York, taking in the Kimberley, Arnhem Land and Gulf of Carpentaria coasts and offshore islands—a region largely characterised by its tropical monsoonal climate, and visited by Macassan trepangers and by the Dutch since the early 17<sup>th</sup> century;
4. the east coast of Queensland, from Cape York to the NSW border, and the Torres Strait Islands, taking in the whole of the Great Barrier Reef and Torres Strait—a region of very hazardous navigation, and with no confirmed external contact until the late 18<sup>th</sup> century.



As the history of coastal navigation shows, Broeze's 'islands' of settlement might be envisaged not just as one 'archipelago', but as a cluster of four, based on Macknight's coastal sectors. Navigation between settlements within each coastal sector was, on the whole, easier and more frequent than navigation between different coastal sectors.

In the modern age we expect maps to be accurate representations of the surface of the earth, based on validated survey. If we use them correctly we won't get lost. But this has not always been the case. The history of cartography is long and complex, crossing back and forth between science, empirical observation, religious belief, conjecture and superstition. Up until about 200 years ago, maps might combine reliable survey with fanciful coastlines based on particular cosmological views, on vague and misinterpreted travellers' tales, or on the simple desire to fill up the map area with something, anything. Few cartographers acknowledged an area of their maps as 'unknown' if there was even the faintest rumour or belief suggesting land existed there. Isolated sections of verified coast many thousands of miles apart would be connected with a confident, but totally fictitious, coastline on the basis that if no-one had been there it could well be land.

The Great South Land, or *Terra Australis Incognita*, was fervently believed to exist, even by otherwise learned and enlightened cartographers, from Ptolemy in the 2<sup>nd</sup> century AD through to Alexander Dalrymple in the 18<sup>th</sup> century. Early cartographers assumed its existence on the basis of the need for 'balance' in the globe, as if the land areas were heavy and the sea and sea floor weighed nothing. Later cartographers assumed its existence partly because earlier cartographers had shown it on their maps, and partly because cartographers seem to have abhorred a vacuum—land was positive, sea was negative, so assume land exists unless it has been proven to be sea. The belief in the Great South Land was slowly eroded by the explorations of the Portuguese, Spanish, Dutch, French and British. Diaz proved that sea existed south of Africa in 1488; Magellan proved that the Atlantic was connected to the Pacific Ocean in 1520, which extended from Patagonia to the Far East. The Dutch, especially Tasman, delineated the north and west coasts of Australia and New Zealand, and established Australia's true 'envelope' by 1642. Finally, in the late 18<sup>th</sup> century, Cook and his British and French contemporaries criss-crossed the South Pacific and Southern Ocean, and finding only sea and a few scattered islands, and finally detailing the outline of Australia, demonstrated the frigid insularity of Antarctica. The believers in the Great South Land, however, were slow to convince, so it was not until the late 18<sup>th</sup> century that the idea of *Terra Australis Incognita* was finally, and reluctantly by some, abandoned.

The maritime investigation and mapping of the coastline of Australia fits into this broader story of the slow understanding of the geography of the southern hemisphere. From its representation as an ill-defined blob in Renaissance charts, Australia was gradually given form by the Dutch voyagers, until, after the explorations of Abel Tasman from 1642-44, more than half of the coastline of Australia had been defined. James Cook filled in the east coast, and largely established Australia's relationship with the Pacific and Antarctica. The later marine surveyors, Flinders, King, Stokes and many others, filled in the missing bits and refined the overall surveys, converting the rough running-survey outline into a refined and accurate chart of the continent's coasts. The coast of the Australian Antarctic Territory across the Southern Ocean to the south was not finally given reliable form until the middle part of the 20<sup>th</sup>



century by the work of Douglas Mawson and others, and more particularly by the combined air and sea surveys of the USA's *Operation Highjump* in 1946-47, and even later, satellite imagery. From the late 20<sup>th</sup> century, more detailed survey has been necessitated by new needs and facilitated by new technologies, revolutionising the definition of the coast and the sea bed. The story of the maritime investigation of the Australian coastline therefore extends across 400 years, from the 16<sup>th</sup> century to the present day.

One focus in this study is on the places that were associated with the story of Australia's maritime investigation. Throughout the text specific places are identified, a number of which may merit further study in the context of heritage lists and conservation action. However, the analysis of these places is a separate process beyond the scope of this publication.

*Michael Pearson*

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# 1

## THE HISTORY OF CARTOGRAPHY AND NAVIGATION

### CARTOGRAPHY AND THE REPRESENTATION OF THE WORLD

**C**artography, the art and science of drawing maps that represent the surface of the earth, has a very long history. It went together with the widening investigation of their world by the geographers and philosophers of the early civilisations—the act of mapping was a way of turning the unknown into the known, of giving concrete form to the complex web of information that indicated that more existed out there than had been previously thought, and ensuring the places found could be visited again.

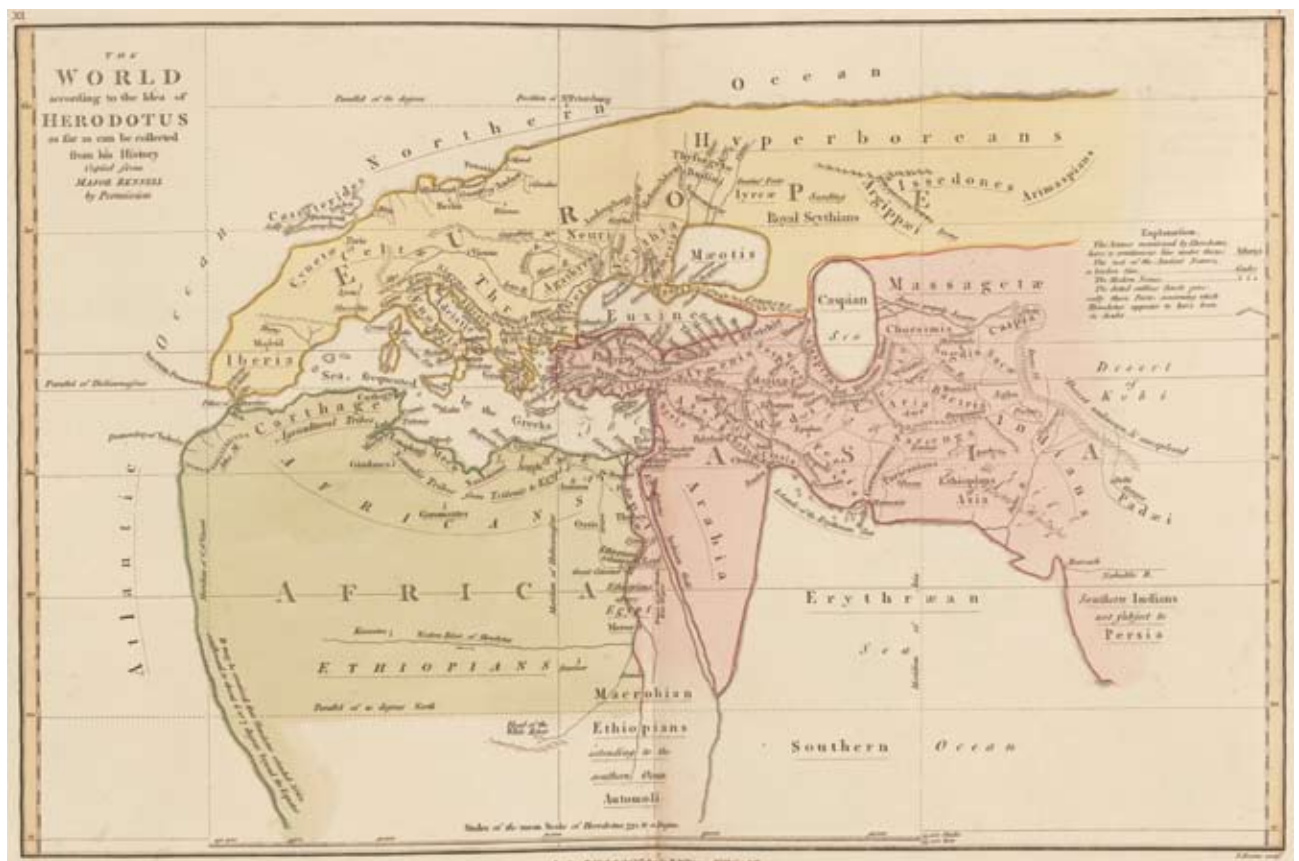
At the time of Homer, the world was conceived as a disc with a mighty river flowing around it, and the earliest surviving map, moulded in clay in the 7<sup>th</sup> or 6<sup>th</sup> century BC, shows this concept, with Babylon at the centre of the world disc. However, by as early as 580 BC, Pythagoras had realised that the earth was a sphere, and from that time onwards there were two different goals of cartography – both difficult to reconcile. One was to represent the experienced world, flat and bounded by terrestrial features, in a form useful to travellers and merchants. The other was to represent the true shape of the earth on paper in a way that dealt with the distortions inherent in drawing a spherical body on a flat map. The tension between these two objectives was not to be resolved for a thousand years.

By the 3<sup>rd</sup> century BC, mapmakers such as Dicaearchus of Messana concluded that the known world (that is, the experienced world rather than the hypothetical spherical planet) was longer east-to-west than north-to-south, with the Middle East, and subsequently the Far East, becoming established parts of the European mental map. In about 200 BC Eratosthenes of Cyrene, keeper of the Library of Alexandria, calculated the circumference of the earth to within 4 per cent accuracy, and drew a map of the world with a grid of parallels and meridians based on Rhodes. Eratosthenes's map extended from western Europe and Britain to India and Ceylon (see Eratosthenes' map below).<sup>4</sup>



The first known charts for seamen—that is maps concentrating on representing the coasts, ports and features useful for navigation—were drawn by Marinus of Tyre in the 1<sup>st</sup> century AD, who, like Dicaearchus, added parallels and meridians based on Rhodes. Marinus was followed closely by Claudius Ptolemy, a mathematician and astronomer born in about 90 AD. Ptolemy, the greatest of the early geographers and cartographers, was the first to devise a projection that allowed a portion of the spherical earth to be systematically represented on a plane surface. His first projection was conical, with the straight meridians converging on the North Pole, and had curved parallels, while his second projection had curved meridians as well as curved parallels. His world map extended from Britain and north-west Africa in the west to India and the Malay peninsula in the east (see Ptolemy's world map below), but was of little interest to the Romans, whose focus was on the Mediterranean and western Europe. As a result Ptolemy's maps were forgotten for 1 000 years. Accompanying his great text on cartography, *Geographica*, were a world map and 26 maps on projections with straight parallels and meridians, extending in sequence from western Europe and northern Africa, east to India, forming in effect the first atlas. There is some debate about whether these maps were original to Ptolemy's work or were drawn much later, based on his book, but whichever is the case, his work, and its rediscovery in 1400, had a profound influence on geographers of the 15<sup>th</sup> and 16<sup>th</sup> centuries.<sup>5</sup>

*A version of Erostrhenes' map. From "The World according to the ideas of Herodotus", from "Atlas Classica, being a collection of maps of the countries mentioned by ancient authors, both sacred and profane: with their various subdivisions at different periods". published by Robert Wilkinson, London 1808 and showing the ancient world across to the borders of India.*  
National Library of Australia



Ptolemy, for the sake of balance or counterpoise to the northern continents, hypothesised a landmass that extended south and east of Africa, enclosing the Indian Ocean before sweeping northwards to join with the landmass of eastern Asia. Thus began the belief in a southern continent, a concept that is a central theme in the conceptualising and then the validating of the Australian continent by European science.



In the centuries following Ptolemy, most maps were related to land travel and geography, or to specific areas of the world in which the coastal detail was coincidental. Navigation was almost entirely limited to coastal voyages, where the ship was seldom out of sight of land, and navigation was based on the personal local knowledge of the pilot. However, by the 12<sup>th</sup> and 15<sup>th</sup> centuries the combination of expanding commercial interests and technological innovation led to major changes in the nature of navigation, changes that had the potential for more extensive voyages.



A Ptolemy map, "*Universalis tabula iuxta Ptolemaeum*" from an edition published in 1625. National Library of Australia

The wind rose, which identified the prevailing winds in the Mediterranean and thereby helped navigators orient their charts, and then the magnetic compass that provided a more reliable method of orientation at sea, were known in the Mediterranean by the 13<sup>th</sup> century (see Glossary). The portolano, or manuscript pilot book giving guidance to sections of the Mediterranean coast, was also introduced at this time, and by the end of the century had been augmented by the portolan chart, which added compass roses and rhumb (direction) lines to the charts to allow courses to be easily marked and bearings to be taken using the magnetic compass. The portolan, developed originally in Venice and Genoa, remained the basic chart form for several hundred years, being progressively adopted by maritime states and improved as they vied for commercial supremacy at sea, reaching its highest form in Portugal and Spain in the 16<sup>th</sup> century.<sup>6</sup>

During the 15<sup>th</sup> century Portugal became a major maritime state and took the lead in chart making, particularly under the guidance of Prince Henry the Navigator, who between 1415 and his death in 1460 devoted his life to the exploration of the west coast of Africa and India. Building on the tradition of exploration established



by Prince Henry, Bartholomew Diaz rounded the Cape of Good Hope in 1488, Columbus discovered the West Indies for Spain in 1492, and Vasco da Gama reached India in 1498.<sup>7</sup>

During this period the tools of the navigator also began to develop. The magnetic compass, which was initially just a magnetised needle mounted on a pivot, was improved by the 15<sup>th</sup> century by mounting the needle in a card that sat on the pivot. This enhanced both its balance and readability, though the idea of dampening its movement by suspending the card in liquid was not hit upon until the mid-19<sup>th</sup> century.<sup>8</sup>

While the exploration of the world was expanding rapidly, there was still an absence of certainty about many aspects of navigation and mapping what had been found, and there were no established standards for cartographers. This is shown by the fact that Columbus was able to adopt an estimate of the circumference of the world considerably smaller than it really was, and hence was able to interpret the West Indies as the East Indies and Japan, thinking he had sailed sufficient distance west of Europe to reach that longitude. Instead of taking Eratosthenes' nearly accurate measurement, which gave a degree of 59.5 nautical miles (instead of the actual 60), Columbus adopted the calculation by the Muslim geographer Alfragan, of 66.2 miles. Columbus, however, assumed that Alfragan used the short Roman mile, and so applying this figure converted Alfragan's degree to just 45 nautical miles. As a result, Columbus was certain in his belief that he had sailed much further around the world than was actually the case, in fact to the Far East.<sup>9</sup>

A stultifying factor in the advancement of cartography was in fact the rediscovery of Ptolemy's work in 1400 and its general distribution throughout Europe during the 15<sup>th</sup> and 16<sup>th</sup> centuries. With the reverence of the age for received knowledge, cartographers tried to fit the new discoveries into the Ptolemaic world view, rather than accepting it as a developmental stage now a thousand years old. Until the late 18<sup>th</sup> century cartographers continued to treat charts as much as speculative treatises as records of known geographic facts, and in this context the acceptance of ancient 'knowledge' was taken as a valid basis for chart making. Speculation about cartographic talismans such as the North-West Passage and the Great South Land was, in this tradition, readily translated onto a chart as 'fact'.

Around the year 1500 both Portugal and Spain established offices for controlling trade and exploration, the Casa da India in Lisbon and the Casa de Contratación in Seville. Up-to-date charts were kept at these offices on a 'commercial-in-confidence basis'. In 1530 the King of Portugal appointed Pedro Nuñez as hydrographer in the Casa da India, and Nuñez again set about finding the solution to accurately projecting the spherical surface of the earth onto a flat parchment chart. He realised that as meridians converged on the pole, their representation as straight lines on charts meant that a vessel crossing meridians at a constant angle on the chart, and thought to be running a straight course, was in fact describing a slow spiral towards the nearest pole.<sup>10</sup> But he did not find the solution to charting the sphere—that was achieved by the Flemish geographer Gerardus Mercator 40 years later.

Mercator published a world map in 18 sheets in 1569. His projection used a rectangular latitude and longitude grid, with a proportional misplacement introduced into the spacing between the parallels of latitude as they move away from the equator. This enabled rhumb lines (the direct magnetic bearings followed by ships) to cut each



meridian at the same angle and be shown as straight lines.<sup>11</sup> However, the benefits offered by his projection to seamen, did not begin to be widely understood until the end of the century. The tables required to construct his new projection were not published until the year of his death, 1594. Richard Hakluyt published a world map on the projection in 1599, but acceptance among seamen came only after the middle of the 17<sup>th</sup> century, when Sir Robert Dudley published his sea atlas using Mercator's projection, *Arcano del mare* (1646), with its familiarity being reinforced by Edmund Halley using the projection for his first meteorological chart in 1686.<sup>12</sup>

During the 16<sup>th</sup> century the focus of chart making had moved to the Netherlands, where in 1570 Abraham Ortelius published his atlas *Theatrum orbis terrarum*, the first true atlas in the modern sense (see Ortelius' World Map below).<sup>13</sup> Ortelius' lozenge-shaped world map is based on Ptolemy's projection. It shows a full 180° extension of the world east and west of a prime meridian passing through the Canary Islands, and a huge 'Terra Australis Nondum Cognita' occupies the entire southern ocean, extending to include Tierra del Fuego and a coast south of Java named 'Beach', 'Lucach' and 'Maletur'. The form of the Southern Continent on Ortelius' map is taken from Mercator's 1569 world map.<sup>14</sup> The place names were taken from Marco Polo's *Travels*, where he refers to a mainland south of Java named Locach (later corrupted to 'Beach'), which had a king and was rich in Brazil wood, gold, elephants and other wonders including the 'porcelain shells' used by other countries as money. Ninety miles south of Lochac was the island of Malaiur.<sup>15</sup>

Richardson has pointed out that Marco Polo had in fact been referring to places south of Champa, or central Vietnam, and that this had been replaced with 'Java' in later editions, including that used by Mercator. Polo called Sumatra 'Java Minor', and his 'Locach' ('Beach') seems to have been part of Thailand.<sup>16</sup>

In 1584-85 the Dutch seaman Lucas Janszoon Waghenaeer published his first sea atlas, inspired by the Portuguese portulans and Ortelius's atlas. The charts included soundings, and standardised symbols for navigation aids and hazards, though it did not use Mercator's projection. The English translation, *The mariner's mirrour*, was published in 1588, and became an immediate success, leading to subsequent collections of charts being known by seamen as 'Waggoners' for over a century to come.<sup>17</sup>





British navigators relied on Dutch charts for the next century, until Samuel Pepys, as Secretary of the Admiralty, in 1681 ordered the survey of the British coast by Captain Grenville Collins. This was published in 1693 as 48 charts within *Great Britain's coasting pilot*. In the same year France published *Le neptune françois*, judged a superior collection to the British one, being based on a triangulation survey and using Mercator's projection.<sup>18</sup> The French maintained their ascendancy in cartography throughout the 18<sup>th</sup> century, establishing the *Depôt des Cartes et Plans de la Marine* in 1720, to produce charts for the navy and merchant seamen. The British equivalent, the Admiralty's Hydrographic Office, was established in 1795 (see more on 18<sup>th</sup> and 19<sup>th</sup> century French and British cartography below).

Ortelius' world map "Typus orbis terrarum" from an edition published in Antwerp in 1570. Detail showing 'Beach'. National Library of Australia



## NAVIGATION—FROM COAST-HOPPING TO CIRCUMNAVIGATION

The evolution of cartography was paralleled by the developments in navigation, though some of the most critical problems were not solved until the 18<sup>th</sup> and 19<sup>th</sup> centuries. The increasing accuracy of navigation had a major role to play in the charting of the Australian coast, as will be seen, so the major aspects of the development of navigation techniques are described briefly here.

The problem of variation in the magnetic compass, the difference in angle between the direction of true north and magnetic north, which varies from place to place and over time, was long recognised, but no solution to it was available until the nature and pattern of the earth's magnetic field were understood.<sup>19</sup> Magnetic deviation, the influence on a compass caused by iron in the ship itself, was not seriously addressed until Matthew Flinders experimented with compensation by placing soft iron bars close to the compass in 1801. These bars, common to magnetic compass binnacles today, are still called 'Flinders bars'. A variation, using soft iron balls fitted to brackets on the binnacle, was introduced as the Thompson Compass in 1876.<sup>20</sup>

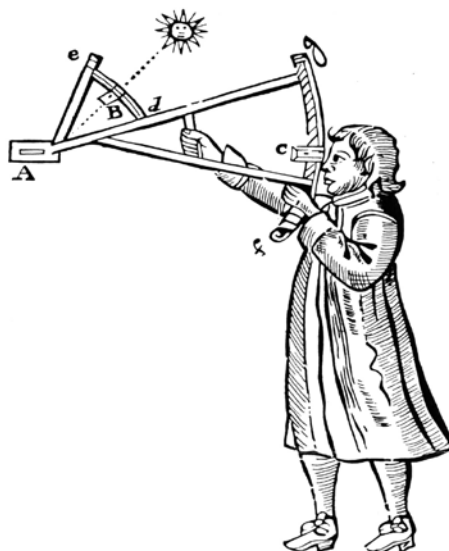
The determination of latitude had been solved by the 15<sup>th</sup> century, by which time readily available astronomical tables listing the sun's declination allowed navigators to determine latitude to within 1 or 2 degrees.<sup>21</sup> This, however, depended on the accuracy of the instruments used to measure the angle of the sun or stars. The astrolabe and the Gunter quadrant allowed angles to be read at sea to within about 5° accuracy, and this was greatly improved by the introduction of the cross-staff in the early 16<sup>th</sup> century, and in 1595, the back-staff or Davis quadrant. The final development was the Hadley's octant, invented in 1731, which allowed an accuracy down to one minute of arc.

The Hadley's octant led directly to the development in 1757 of the sextant, which allowed a wider field of angle taking, enabling the instrument to be used effectively to take both vertical and horizontal angles, used in both celestial and terrestrial navigation and cartography. The sextant has remained, with some refinements, the standard navigation tool until the present day, though it is now largely replaced by satellite position finding technology.<sup>22</sup>

While the determination of latitude had been solved, and made easier as the instruments improved, no means existed to determine longitude. So while the north-south navigation of the coast of Africa was charted reasonably accurately, once the voyagers started travelling west to east across the Indian Ocean, location became difficult to fix and the position of features on charts became less trustworthy.

Longitude was only meaningful in establishing a position on the globe if some particular longitude was selected as the starting point from which one travelled east or west. This was the 'prime meridian'. Longitude was much more difficult to determine than latitude, as the sun did not provide a reference point against which to measure the east-west position. The longitude chosen to be the prime meridian has, since the time of Eratosthenes, been variously that of Alexandria, Rhodes, the Canary Islands, the Cape Verde Islands, the Azores, the Lizard, Paris, London and many other places. The confusion this caused seamen led to the adoption, by international agreement in 1884, of Greenwich as the prime meridian for maritime charts.<sup>23</sup>





above: *The Hadley octant, designed by John Hadley in 1731. This mahogany model was made by the famed London instrument maker, George Adams, in 1760.*

left: *The Davis quadrant of 1559. An illustration from John Seller's 1669 book "Practical Navigation; or an Introduction to that whole art", printed by J Darby at Wapping.*

far left: *The use of the cross staff. An illustration from John Seller's 1669 book "Practical Navigation; or an Introduction to that whole art", printed by J Darby at Wapping.*

In the absence of another technique, longitude was estimated by judging how far the ship had travelled east or west over a particular length of time, an approach known as 'dead reckoning'. This was done by keeping records of the direction of travel and the speed of the ship. Speed was judged using the 'log-line', a 150 fathom line marked at intervals with knots attached to a wooden board, which was thrown overboard and, through drag, stayed relatively motionless in the ship's wake while the line was let out from a cylindrical reel. As the line spun out, the time was recorded by turning a sand-glass measuring 7 to 14 second intervals, and the number of knots counted, giving the speed in knots, or miles in an hour. This was repeated, normally, every half hour.

The system was full of sources of error: the coordination of release of the log-line and turning of the glass; variations in the flow of sand through the glass at sea; the coordination of the call of time-up and stopping the log-line; the fluctuations in speed between the recording sessions; and the fact that the spacing of knots, supposedly placed proportionally to equate with nautical miles (or minutes of a degree) travelled, varied from ship to ship, so that as late as the time of James Cook's voyages, lines were knotted at 42, 45, 45.5, 48, 49, 50 and 51 feet intervals, when the correct distance to give an accurate result was 50 feet.<sup>24</sup> Mechanical 'patent logs', which gave constant readouts, were invented in the late 18<sup>th</sup> century, but did not come into common use until well into the 1800s. In addition, speed and direction were both influenced by the deep-sea currents, which were difficult to detect and even harder to measure at sea, and leeway, the degree to which a ship 'slipped' off its course due to the pressure of the wind. The direction and speed of major ocean currents were progressively marked on charts, and tables to help calculate leeway began to be published in the 18<sup>th</sup> century.<sup>25</sup>

A common method of avoiding the complications of navigation was to sail north or south to the latitude of the destination, then sail along the parallel until the destination was reached. The distance travelled was estimated by dead reckoning, but the known in-built errors in this method meant that a careful lookout was kept when the end of the trip was thought to be near. Many of the shipwrecks on Australia's coasts occurred because the Dutch had adopted this practice in running eastward along a latitude through the southern Indian Ocean, then turning north when the estimated longitude of Java was reached. A miscalculation of distance covered sometimes meant



an abrupt meeting with the Western Australian coast, as witnessed by the Dutch and other shipwrecks along that coast.

Accurate determination of longitude remained the key navigational challenge until the invention of the chronometer in the 18<sup>th</sup> century, though ‘technology lag’ meant that the average seaman didn’t benefit until chronometers became more affordable in the mid-19<sup>th</sup> century. The key to determining longitude was the realisation that, as the earth rotated, the position of the sun moved westward at the rate of 15° per hour (i.e. 360° in 24 hours), so to calculate longitude meant finding a means of comparing the time at the prime meridian with the local time on the ship, multiplying the difference in hours by 15, which gave the number of degrees east or west of the prime meridian. The obvious answer was to use a good clock, but the accuracy of clocks was poor and they could not be relied upon over the long periods of time needed for ocean navigation, nor could they cope with the rigours of the marine environment, variations in temperature met in the tropics or polar seas, and the constant movement of the ship.

The best method that could be devised was based on the relationship between the position of the moon and adjacent stars, which changes constantly over time. If the relationship of moon and stars at a particular time at the prime meridian was known, then it could be determined on the ship by astronomical observation, and the difference in prime and local time calculated. Lunar events that could be measured, apart from the distance between a given star and the moon (the lunar distance), were the beginning and end of solar and lunar eclipses, and the occultation of stars and planets by the moon. Edmund Halley experimented with this approach in the late 17<sup>th</sup> century, and prepared tables that proved to be insufficiently accurate for navigation.<sup>26</sup>

The importance to navigation of improving knowledge of the movement of heavenly bodies is reflected in the establishment in Britain of the Royal Observatory at Greenwich in 1675, founded with the stated aim of creating tables for navigational purposes, and of the Board of Longitude in 1714, to encourage and test approaches to the problem, with a substantial reward attached for the successful solution. A major handicap in using the system of lunar observations was the relative inadequacy of the navigational instruments available at the time. The powerful telescopes needed to observe lunar occultation could not be used aboard ship, and, until the invention of Hadley’s octant in 1731, no instrument could measure lunar distances with the required accuracy. This accuracy was improved even further with the invention of the sextant in 1757 and the reflecting circle in 1758.

More accurate astronomical tables began to be developed in the mid-1700s, and the first British *Nautical almanac*, giving tables of astronomical locations over the coming year, was published in 1767. The French had published similar tables as early as 1679 (*Connaissance de temps*), but for practical purposes these were only of use in properly equipped land-based observatories. While the problem of longitude would appear to have thus been solved, all was not quite as straightforward as it looked. The process of observation was difficult and time-consuming, a series of observations involving several observers and recorders having to be averaged to reduce errors. Then the effect of atmospheric refraction and parallax error on the observed position of the star or planet and moon had to be calculated and the positions corrected. Finally, a complicated piece of mathematical computation was needed to ascertain



the correct local time and compare it with that of the prime meridian. This was beyond the skills of many ships' officers, and inaccuracy in longitude calculation remained common.<sup>27</sup>

The difficulty is illustrated by James Cook's own experience. Cook's astronomer, Charles Green, who was given the responsibility of taking Cook's longitude positions by lunar distance calculations, and one occultation observation at Endeavour River, produced progressively inaccurate longitude estimates in the course of the voyage up the east coast. Green's health was failing, and even the expert astronomer was less able to take accurate observations and make the required difficult computations as a result.<sup>28</sup>

Other methods of calculating longitude based on astronomical observation, magnetic variation and magnetic dip were proposed, but none was really practical for use at sea.<sup>29</sup> It came back to the most obvious solution, reputedly proposed by Gemma Frisius in 1530 the use of an accurate clock set to the time at the prime meridian, compared with observed local time. Many attempted to refine the clock, but it was John Harrison who produced and tested the first reasonably accurate clock for use at sea in 1735. His second version was produced in 1741 and his third in 1759, with a miniature version (H.4) ready by 1760. It was this last model that became the pattern for subsequent marine chronometers. Harrison eventually won the Board of Longitude £20 000 reward, finally paid in 1772 following prolonged testing and delays.<sup>30</sup>

Kendall's copy of Harrison's H.4 was used by Cook on his second and third voyages, and by Vancouver on his 1791-95 voyage via south-west Australia to the North American coast. However, the considerable cost of purchasing chronometers was initially the responsibility of the ships' officers, and they were not officially issued to ships of the Royal Navy until 1825. By 1880 the use of chronometers had become so widespread that lunars were rarely used, and the tables required for lunars were omitted from the Nautical Almanac from 1906.<sup>31</sup>

The charting of the Australian coast, it can be seen, straddles the period of major changes in the science of navigation. The methods used and the instruments carried by particular mariners determined, to a considerable degree, the confidence with which they approached and navigated the coast, and the accuracy of their surveys.



# 2

## THE PORTUGUESE DEBATE: THE DIEPPE MAPS

Is there evidence of mid-16<sup>th</sup> century mapping of Australia, embedded in French maps based on Portuguese sources? Such a possibility has been argued for over 200 years, based on the so-called Dieppe maps.

The Dieppe maps date between 1542 and 1587 and were made by a group of French cartographers who became known as the Dieppe school, based in the major port in Normandy. However, from place names used and other evidence on the maps themselves, the maps are clearly based on a common source or sources, identified as being Portuguese. The maps, which are held by a number of different institutions, include a number of world and regional maps that portray 'Java-la-Grande', which has been interpreted by some as being the Australian continent. No maps made in Portugal itself have been found portraying Java-la-Grande, so the original source or sources remain obscure.<sup>32</sup>

The Dieppe maps showing Java-la-Grande are:<sup>33</sup>

1. World map of Jean Mallard in *Le premier livre de la Cosmographie* (c.1540)
2. Jean Rotz' map in *Booke of idrography* (1542)
3. World map of Guillaume Brouscon (1543)
4. Cartographic sketches and cosmographical treatise by Jean Alphonse (1544)
5. Pierre Desceliers' world chart (1546)
6. Harleian or Dauphin world chart (c.1547)
7. Nicolas Vallard, portolan atlas (1547)
8. Pierre Desceliers' world chart (1550)
9. Anonymous portolan atlas (Bibliothèque de la Ville de Lyon) (c. 1550)
10. Pierre Desceliers' world chart (1553, now destroyed)
11. *Cosmographie universelle selon les navigateurs* (1555).



12. World chart by Nicholas Desliens (1562?, now destroyed)
13. World chart by Nicholas Desliens, Bibliothèque Nationale, Paris (1566)
14. World chart by Nicholas Desliens (1567)
15. World chart by or after Nicholas Desliens (1568?)
16. *Livre da la marine [du] Pilote Past Map*, after Le Testu? (1587?).

(uncertain dates are marked with ?)

Speculation about what might have been the possible sources of information about the purported continent south of Java includes the French voyage of Jean Parmentiers in 1529-30, recorded by Pierre Crignon in his now-lost *La perle de cosmographie* (1534), and possibly plagiarised in Jean Alfonse's *Voyages aventureux* (c. 1536).<sup>34</sup>

## IS JAVA LA GRANDE AUSTRALIA?

As early as 1786, Alexander Dalrymple, later to become the British Admiralty's first hydrographer, suggested that the Harleian or Dauphin map, which had been lent to him by Sir Joseph Banks, in its representation of Java-la-Grande was evidence of the Portuguese 'discovery' of Australia.<sup>35</sup> Richard Henry Majors, Keeper of Maps at the British Museum between 1867 and 1880, argued the case first for Portuguese discovery, then for French, based on the maps. In Australia the proposition of Portuguese priority was championed by George Collingridge, in his book *The discovery of Australia* in 1895.<sup>36</sup>

The best known recent interpretation of the Dieppe maps in Australia is Kenneth McIntyre's elaborate interpretation of them as representing the east coast of Australia. McIntyre's argument is directly tied to his contention that the coast was charted by Cristovao de Mendona in the 1520s.<sup>37</sup>

McIntyre claims a number of physical 'proofs' of the Portuguese reaching the coast in the 1500s. Given that this project has as its objective the identification of places of significance on the coast, this evidence is worth discussing.

***The Carronade Island guns***—McIntyre's identification of two guns, found on Carronade Island in Napier Broome Bay on the Kimberley coast in 1916, as Portuguese guns cast in Seville in the 15<sup>th</sup> or early 16<sup>th</sup> century has been thoroughly debunked by Jeremy Green. Green has shown by physical, chemical and x-ray examination that the guns are in fact of South-East Asian manufacture, date after the late 18<sup>th</sup> century, and were probably used by Macassan trepangers.<sup>38</sup>

***The 'Geelong keys'***—A set of keys recorded by La Trobe (later Victorian Governor) in 1847 as being found at Limeburners Point, Geelong, were lost soon after and their origin and antiquity cannot now be tested. La Trobe himself records that the keys were 'very little, if in any way corroded with rust, very similar to those of the present day, except that they were a little longer in the shank, and the wards were smaller than is now usual.' He estimated them to be at most 100 or 150 years old.<sup>39</sup> There is no evidence to suggest that they were Portuguese.

***The Warnambool wreck***—The Warnambool wreck remains the classic popular 'mystery' for which no evidence has ever been found to demonstrate antiquity.



McIntyre claims they are the remains of Cristovao de Mendona's caravel of the 1520s. Even if the remains of a ship are eventually found, the location of this section of coast in relation to ocean currents means that vessels waterlogged and abandoned in the Southern Ocean or Indian Ocean west of Australia could well end up ashore there. Ship remains need not be evidence of deliberate landing or an in-situ wreck.<sup>40</sup> Amphora found west of Warnambool have been found to be of north African origin, perhaps resulting from the same drift patterns.<sup>41</sup>

***The Bittangabee ruins***— McIntyre claims that a ruined building at Bittangabee Bay, near Twofold Bay on the New South Wales coast, was a fortress built by the Portuguese expedition. The ruins have been shown to have been built as a store house by the Imlay brothers, who had whaling and pastoral interests in the area. The commencement of the construction was witnessed by Protector of Aborigines G.A. Robinson in July 1844. The building was left uncompleted after the collapse of Imlay interest following the death of two of the three brothers in 1846-47. There is absolutely no evidence to suggest that the ruins are anything other than the remains of the Imlay venture.<sup>42</sup>

McIntyre's primary argument is built on an elaborate series of explanations based on navigational and cartographic anomalies, claimed to have been responsible for the substantial distortions seen in the Dieppe map representations of the coastline. This aspect of McIntyre's thesis has also been seriously questioned.

McIntyre's navigational and related cartographic arguments have been assessed by Ariel, himself a master mariner, who argues that they cannot be sustained.<sup>43</sup> In particular, Ariel shows that McIntyre's argument, that the south-east trending coastline of 'Australia' is due to combined use of magnetic north and ignoring of erration, is 'totally invalid'. McIntyre implied a constant rate and direction of magnetic variation over time, which is not correct, and the actual change in variation provides a very different result to the one McIntyre calculates. McIntyre also substantially overestimates the impact of erration (the error in plotting of position due to the fact that in sailing in some directions, what appears to be to the navigator a straight line becomes in fact a spiral towards the pole—a 'loxodromic curve'). The result is that these two 'errors' of navigation and plotting cannot be used to make the Dieppe maps' east coast match that of Australia. The argument about the distortion due to gores is also argued by Ariel to be wrong—firstly it is based on an unproven assumption that the maps originated as a globe, and secondly the representation of a coast on two sides of a gore should reflect the same latitude and direction of coastline at each point where the gore separates the coast, yet in the Dieppe maps there is no evidence of this.

An equally elaborate variation on the McIntyre theory was developed by Lawrence Fitzgerald, who argued that the Dieppe maps were the result of distant cartographers putting together various original charts, and getting the 'jigsaw' pieces in the wrong places.<sup>44</sup> Fitzgerald rearranged the pieces, and arrived at a coastline that more closely resembled Australia's. Such an approach, unless based on very sound historical or contextual material, which this one is not, could be used to create the likeness of any coast previously selected.

Another variation on the McIntyre thesis, and subject to many of the same objections, is that of Roger Hervé. Hervé believes the Dieppe maps were mainly based on the single voyage of João Afonso in 1525-27, in the *San Lesmes*.<sup>45</sup> Hervé claims that Afonso was driven south from west of the Straits of Magellan, and that he was driven



by extremely unusual winds west to the coast of New Zealand, then on to the coast of Australia, where the *San Lesmes* was wrecked (becoming the Warnambool wreck). Afonso and the crew then travelled by land or boat up the east coast to the latitude of Rockhampton, where he met up with the crew of the Portuguese Gomes de Sequeira, who had been exploring the Moluccas. In Hervé's version, Cap de Fremose, which appears on many of the Dieppe maps as an easterly projection of the coast, is identified as New Zealand's East Cape—McIntyre identified it as Cape Howe, and Fitzgerald as the north-east corner of Tasmania!<sup>46</sup>

## DOES JAVA LA GRANDE REPRESENT SOMEWHERE ELSE?

There are a number of other interpretations of the Dieppe maps, which differ enormously from the McIntyre model. These are generally based on the idea that small-scale maps of particular coastlines were often combined to create maps covering much larger areas. At a time when latitude and longitude were often not marked on maps, and when scales were sometimes not included, it is argued that mistakes in scale by the 'armchair' cartographers making the compilations were frequent. In this context it has been argued that Java la Grande is based on maps of other coastlines transposed at the wrong scale and joined together where they made most sense to the cartographer. It is somewhat similar to Fitzgerald's jigsaw approach, but the pieces of the picture are not in fact parts of Australia.

WAR Richardson provides the most extensively argued version of this approach. He bases his interpretation on place name analysis, to show that the west coast of the Dieppe Java la Grande is a mis-scaled map of western Java, and the east coast is a displaced and mis-scaled version of Vietnam.<sup>47</sup> Campbell Macknight made a similar connection with the west coast of Java in a 1983 article, though his equating of the coast of Sumba with the east coast on the Dieppe maps is less well argued.<sup>48</sup> Sharp, in a similar way, interpreted the Dieppe maps as showing the coasts of the Indonesian islands of Sumatra and Java, or of Java and Sumba<sup>49</sup>.

## THE DIEPPE MAPS—A CONCLUSION

The various interpretations of the Dieppe Maps are all based on passionately held belief and elaborate interpretation that holds some elements of a convincing argument. But, as the eminent geographer and historian Oskar Spate pointed out, they can't all be correct!<sup>50</sup>

Setting aside the intricate arguments of the pro- and anti-Portuguese writers, what can we say about the Dieppe maps in the context of this project? In relation to the central theme of 'mapping of the coastline', a key element is the role of mapping and scientific investigation in expanding knowledge about Australia—it is about 'knowing' Australia more than simply 'mapping' it. If the Portuguese did in fact map the northern, western and eastern coasts, this information was hidden from general knowledge, and did not expand European knowledge of the continent. The Dieppe maps had no claimed sources, no 'discoverer' of the land shown and hence no journals to back them up, and the iconography on the various maps is based on Sumatran animals and ethnography<sup>51</sup>, not on the reality of Australia. In this sense, the



maps did not really expand knowledge of Australia, the portrayal of Java la Grande having no greater status than any other conjectural portrayal of Terra Incognita. The various claims for physical evidence of Portuguese presence on the Australian coast have either been disproved by subsequent research, or the evidence is unable to be investigated, as in the case of the Geelong keys, and, in the case of the Warnambool wreck, remains so despite extensive research.

If the Dieppe maps are, instead, the result of combining mis-scaled and wrongly located maps of other places to create a new large-scale map of a bogus continent, they become meaningless to the Australian story. The ‘cartographic bungle’ interpretation, as Duncan has pointed out, has the benefit of being simpler and might appeal to those wishing to apply Ockham’s razor.<sup>52</sup> It also appeals, for much the same reason, in so much that in a choice between a conspiracy (the ‘secret discovery of Australia’), and a mistake or accident (the ‘cartographic bungle’), the latter is, more often than not, the likely explanation.

While British geographers of the early 19<sup>th</sup> century, including Matthew Flinders, believed that the maps indicated early knowledge of the northern and western coasts of Australia, probably by the Portuguese or Spanish, they had no proof that they were right. Their patriotic veneration of Cook precluded any such admission for the east coast, though the evidence they gave credence to was just as strong for that coast as the others. While there is certainly a strong possibility that South-East Asian or European voyagers might have reached the northern or north western coasts of Australia, given the proximity of those coasts, it is much less likely that they ventured, west to east, through the highly dangerous Torres Strait and down the equally dangerous inner Great Barrier Reef route north to south.<sup>53</sup>

Whether the Dieppe maps demonstrate a detailed mapping of the coastline by the Portuguese remains an unproven, and on the balance of probability, an unlikely proposition, though it will no doubt continue to be an intriguing possibility argued about forever. Even if the Dieppe maps did result from a Portuguese voyage, the absence of any expansion of knowledge of the continent arising from that event, or in the 80 year interval between the purported Portuguese mapping and the documented sighting by Willem Jansz, would make the ‘discovery’ somewhat irrelevant in the context of the study’s theme. As none of the places named on the Dieppe maps can be demonstrably identified with places on the Australian coast, nor with any specific Portuguese activities on the coast, the maps are not a basis for identifying places of heritage significance.



**TABLE 1**      **TIMELINE OF EXPLORATION AND SURVEY**  
**OF THE AUSTRALIAN COASTLINE**

DATE	EXPLORER	SHIP	REGION	NOTES /SOURCE
1606	Willem Jansz (Janszoon)	<i>Duyfken</i>	Cape York, Gulf of Carpentaria	March. First authenticated European sighting of the Australian coast. Landed at Port Musgrave (Batavia River —from 1939 renamed Wenlock River), where one of his crew was killed by Aborigines. Herres 1899. Sigmond & Zuiderbaan 1995; Kenny 1995; Feeken & Feeken 1970; Howgego 2003.
1606	Luis Váez de Torres	<i>San Pedrico, Los Tres Reyes</i>	Torres Strait	July/August. Determined that Quiros's assumption that Espiritu Santo Island in Vanuatu was the coast of Terra Australis was wrong, by sailing west through Torres Strait possibly sighting Australia. Sighted Long Reef off Cape York. Torres's report remained in archives till discovered in 1762 by Alexander Dalrymple. Howgego 2003; Hilder 1980.
1616	Dirck Hartog	<i>Eendracht</i>	Shark Bay to North West Cape	October. Sailing too far east enroute to Bantam, and reached the Australian coast. Hartog's plate left on Dirk Hartog Island is the oldest relic associated with Europeans yet located in Australia. Kenny 1995, Sigmond & Zuiderbaan 1995; Feeken & Feeken 1970; Howgego 2003.
1618	Haevick Claesoon	<i>Zeewolf</i>	North West Cape and coast	11 May. Second sighting of the west coast of Australia at 21°20'S unable to land and proceeded to Java. Howgego 2003; Heeres 1899.
1618	Lenaert Jacobszoon (Jacobs[z])	<i>Mauritius</i>	Area near North West Cape, WA (22° S)	31 July. Accompanied by Willem Jansz. Landed on an island on the WA coast. Howgego 2003; Heeres 1899.
1619	Frederick de Houtmann	<i>Dordrecht and Amsterdam</i>	Rottnest Island, Houtman Abrolhos Islands to 26° 20' S	July. Rottnest Island sighted but not landed on. Sighted and charted the 'Abri voll olos' ('beware; keep your eyes open') or Abrolhos Islands. Sigmond & Zuiderbaan 1995; Kenny 1995; Howgego 2003; Heeres 1899.
1622	Name unknown	<i>Leeuwin</i>	Cape Leeuwin area	The discovery of Cape Leeuwin was noted on a map by Hessel Gerritsz in 1627. Nothing else is known of the voyage or the master. Named by Flinders. Feekin & Feekin 1970; Kenny 1995.
1622	Name unknown	<i>Wapen van Hoorn</i>	Shark Bay area	VOC ship ran aground on reef, June 1622, but got off undamaged. Heeres 1899.
1622	John Brooke	<i>Trial (Tryall)</i>	Montebello Islands, Point Cloates	First English sighting of Australia. Survivors sailed boats north to Batavia. Howgego 2003; Heeres 1899.
1623	Jan Carstensz (Carstenszoon)	<i>Pera and Arnhem</i>	Cape York, Gulf of Carpentaria	January. Jan Carstensz left a marker at Staten River to name the place and 'Carpentaria' (also sighted Cape York). Heeres 1899; Sigmond & Zuiderbaan 1995; Kenny 1995; Feeken & Feeken 1970.
1623	Willem van Coolsterdt (Colster)	<i>Arnhem</i>	Gulf of Carpentaria, Arnhem Land	January. Van Colsterdt in <i>Arnhem</i> , after deserting Carstensz in <i>Pera</i> , sights what became Arnhem Land, and charted Cape Arnhem (as De Caep Hollandie). Sigmond & Zuiderbaan 1995; Kenny 1995; Feeken & Feeken 1970; Howgego 2003; Heeres 1899.
1623	Klaas Hermanszoon	<i>Leiden</i>	Lands south of Shark Bay	Australia's first known European birth took place. Sigmond & Zuiderbaan 1995; Schilder 1985.



DATE	EXPLORER	SHIP	REGION	NOTES /SOURCE
1624	Unknown	<i>Tortelduyff</i>	Turtledove Shoal, south of Houtman Abrolhos, WA	Sighting of the shoal was mapped by Hessel Gerritz in 1628. Howgego 2003; Sigmond & Zuiderbaan 1995.
1626	Daniel Janssen Cock	<i>Leiden</i>	Followed coast from Zuytdorp Cliffs to Dirk Hartog Island	Second sighting by <i>Leiden</i> , but no landing. Heeres 1899.
1627	Pieter Nuyts and Francois Thijssen	<i>Gulden Zeepaard (Gulden Zeepaert)</i>	King George Sound to Ceduna	Coasted along the Great Australian Bight and charted St Peter and St Francis Islands of the Nuyts Archipelago in the eastern Great Australian Bight, and sighted the adjacent continent. Purry proposed a Dutch colony here in 1717. Sigmond & Zuiderbaan 1995; Feeken & Feeken 1970; Kenny 1995; Howgego 2003; Heeres 1899; Schilder 1976.
1627	David Pieterszoon de Vries and J. van Roosenbergh (Supercargo)	<i>Wapen van Hoorn</i>	Shark Bay area	Touched at Shark Bay en-route to Batavia. Revision of Hartog's chart of the area. Howgego 2003; Sigmond & Zuiderbaan 1995; Heeres 1899.
1627	Jan Coen	<i>Galias, Utrecht and Texel</i>	Houtman Abrolhos	Damage in storm to the <i>Galias</i> off the WA coast, and reef sighted but no land. Ships were carrying Governor-General Jan Coen to Batavia, and incident prompts call for more accurate charting of the coast by VOC. Sigmond & Zuiderbaan 1995; Heeres 1899.
1628	Gerrit Frederikszoon De Witt	<i>Vianen</i>	Pilbara Coast/ North West Cape	Ship enroute on return from Batavia to Netherlands, nearly wrecked in 21°S. The area was subsequently known as G.F. de Witts Landt. Feeken & Feeken 1970; Howgego 2003; Heeres 1899; Sigmond & Zuiderbaan 1995.
1629	Adriaen Jacobszoon and Francois Pelsaert	<i>Batavia (&amp; ship's boat), and Sardam</i>	Houtman Abrolhos to North West Cape	4 June. Ship wrecked on the Houtman Abrolhos, and Pelsaert went in a boat north along the coast to Batavia, and returned in ship <i>Sardam</i> . Two men were marooned on the mainland at the mouth of the Murchison or Hutt River. Many killed on the islands by mutineers, and the base of a stone fort survives on High Island. Aborigines sighted. Feeken & Feeken 1970; Howgego 2003; Sigmond & Zuiderbaan 1995.
1635	Wijbrandt (Woolebrand) Geleynnszoon De Jongh	<i>Amsterdam</i>	Shark Bay	Sighted coast in vicinity of Shark Bay, but did not land. Heeres 1899.
1636	Pieter Piertszoon	<i>Klein Amsterdam and Wessel</i>	Melville Island, north coast and Gulf of Carpentaria	Commander Gerrit Thomas Pool killed in New Guinea and Piertszoon took over exploration of Southland coast. Feeken & Feeken 1970; Kenny 1995; Howgego 2003; Heeres 1899; Sigmond & Zuiderbaan 1995.
1636	Antonie Caen	<i>Banda</i>	South-west coast, Bernier Island	Off the coast, apparently near Bernier Island, Caen made what has been interpreted as the first sighting of black swans. Kenny 1995.



DATE	EXPLORER	SHIP	REGION	NOTES /SOURCE
1642	Abel Janszoon Tasman	<i>Heemskerck</i> and <i>Zeehaen</i>	Tasmania, New Zealand	Named and charted Maatsuyker, Maria, Schouten and a number of other islands. Landed at Frederick Hendrix (Hendrik) Bay (now North Bay, Tasmania), and raised a flag to take possession. First circumnavigation of Australian continent. Duyker 1992; Sigmond & Zuiderbaan 1995; Kenny 1995; Howgego 2003; Heeres 1899.
1644	Abel Janszoon Tasman	<i>Limmen</i> , <i>Zeemeeuw</i> and <i>Bracq</i>	Gulf of Carpentaria to North West Cape	Charted long section of WA coast. Feeken & Feeken 1970; Howgego 2003; Heeres 1899.
1648	Jan Janszoon Zeeuw	<i>Leeuwerik</i>	West Coast	Sent to coast northwards towards Batavia from 25°-26°S, but no voyage details are available. Heeres 1899.
1656	Pieter Albertsz (Albertszoon)	<i>Vergulde Draeck</i> (and ship's boat)	Cape Leschenault to North West Cape	28 April. Seven survivors of the wrecked <i>Vergulde Draeck</i> sailed a ship's boat north from near Cape Lechenault (north of Perth) to Batavia. 68 other survivors, including Albertsz, were left ashore, but never found again. Howgego 2003; Heeres 1899; Playford 1996; Sigmond & Zuiderbaan 1995; Green 1984.
1656	unknown	<i>Witte Valck</i> and <i>Goede Hoop</i>	West coast north of Swan River	Ships sent by the Governor of Batavia to search for survivors of the <i>Vergulde Draeck</i> . Three crewmen of <i>Goede Hoop</i> disappeared ashore, and eight were lost when their boat was smashed on rocks. Howgego 2003; Heeres 1899; Sigmond & Zuiderbaan 1995.
1657	unknown	<i>De Vinq</i> and <i>Veenenburgh</i>	West coast north of Shark Bay	Vessels diverted from Cape of Good Hope to Batavia route to search for survivors of the <i>Vergulde Draeck</i> . Storms prevented landing and the coast was quit after four days. Howgego 2003; Sigmond & Zuiderbaan 1995; Heeres 1899.
1658	Samuel Volckerts and Aucke Pieterszoon Jonck	<i>Waeckende Boey</i> and <i>Emerloort</i>	Rottneest Island to Houtman Abrolhos and north to Shark Bay	Rottneest Island explored by men from the <i>Waeckende Boey</i> searching for survivors of the <i>Vergulde Draeck</i> wreck of 1656. First known coastal views drawn. Wreckage found, but no survivors. 14 men from <i>Waeckende Boey</i> were abandoned after their boat was thought to have been lost, four of whom made their way back to Batavia under Abraham Leeman. Sigmond & Zuiderbaan 1995; Howgego 2003; Heeres 1899.
1658	Jacob Pieterszoon Pereboom	<i>Elburg</i>	Cape Lechenault to Geographe Bay	Dutch ship diverted from route between the Cape and Batavia to search for survivors of the <i>Vergulde Draeck</i> wreck. Took refuge from weather in 33°14'S. Sighted Aborigines. Howgego 2003; Heeres 1899; Sigmond & Zuiderbaan 1995.
1678	Jan van der Wall	<i>Vliegende Zwaan</i>	North West Cape to Roebuck Bay	Charted coast enroute from Ternate to Batavia. Howgego 2003; Heeres 1899.
1681	John Daniel	<i>London</i>	Houtman Abrolhos	First descriptions and charting in English of Australia, published by Dalrymple 100 years later. Chisholm 1958.



DATE	EXPLORER	SHIP	REGION	NOTES /SOURCE
1687	Abraham Duquesne-Guitton	<i>L'oiseau</i> ( <i>L'Oiseau</i> )	South West Coast	4 August 1687. Capt Duquesne Guitton in command of <i>L'oiseau</i> noted he was in sight of Eendracht Land. The ship was conveying a French Ambassador Claude Ceberet to the Kingdom of Siam, where he was to establish an embassy. Godard, Aust. Assoc. Maritime Hist. Newsletter 79 (2000).
1687	Nicolas Gedeon de Voutron	unknown	Swan River	Reported visit by unknown ship to latitude as Swan River. Voutron urged the Minister of the Navy to establish a settlement at the mouth of the river. Godard, Aust. Assoc. Maritime Hist. Newsletter 79 (2000).
1688	Captain Read, William Dampier	<i>Cygnat</i>	King Sound, WA, and 100 km eastward	Careened ship. Met with 40 Aborigines. George 1999; Howgego 2003; Heeres 1899; Dampier 1697 [1998].
1697	Willem de Vlamingh	<i>Geelvinck</i> , <i>Nijptangh</i> and <i>Weseltje</i>	Swan River to North West Cape	Searching for remains of missing VOC ship <i>Ridderschap van Holland</i> . Landed at Cottesloe north of the Swan River mouth with 86 soldiers and explored inland, and Rottnest Island. Both ships inspected the coast northwards with several shore explorations. Vlamingh removed Hartog's plate from Dirk Hartog Island, and replaced it with a new one. Schilder 1985; Heeres 1899; Sigmond & Zuiderbaan 1995; Kenny 1995, Feeken & Feeken 1970.
1699	William Dampier	<i>HMS Roebuck</i>	Houtman Abrolhos to Broome, Dampier Archipelago	Named Shark Bay. Kenny 1995, Feeken & Feeken 1970; Dampier 1703.
1705	Maarten Van Delft	<i>Vossenbosch</i> , <i>Waijer</i> , and <i>Nieuw-Holland</i>	Northern Australia	Sent to pre-empt possible English exploration after Dampier. Skirted the north coasts of Bathurst and Melville Islands, and the Coburg Peninsula. Schilder 1989; Kenny 1995; Heeres 1899; Howgego 2003.
1712	Marinus Wysvliet (Wijsvliet)	<i>Zuytdorp</i>	Zuytdorp Cliffs, north of Geraldton	VOC ship wrecked, survivors reached shore and set up camps, and probably helped to find water by Aborigines, and possibly lived with and intermarried Aboriginal community. Wreck site discovered 1927. Playford 1996; Howgego 2003; Sigmond & Zuiderbaan 1979.
1727	Jan Steyns	<i>Zeewijk</i> (and <i>Sloepie</i> )	Houtman Abrolhos to North West Cape	<i>Zeewijk</i> was wrecked 9 June on Half Moon Reef in the Houtman Abrolhos after captain disobeyed sailing instructions and tried to anchor off Eendracht's Land. The survivors built a boat (the first known European boat built in Australia) named the <i>Sloepie</i> , and sailed it up coast and to Batavia. Howgego 2003; Heeres 1899; Sigmond & Zuiderbaan 1995; Kenny 1995.
1756	Jean Etienne Gonzal & Lavienne Judithwijk van Asschen	<i>Rijder</i> and <i>Buijs</i>	Gulf of Carpentaria and Arnhem Land	The last of the Dutch East India Company exploration of Australia. There are no surviving maps of the voyage, and though a favourable report was made, the Company abandoned any further interest in Australia. Kidnapped Aborigines. Schilder 1989; Howgego 2003, Heeres 1899, Macknight 1969; Sigmond & Zuiderbaan 1995.



DATE	EXPLORER	SHIP	REGION	NOTES /SOURCE
1768	Louis-Antoine de Bougainville	<i>La Boudeuse</i> and <i>Etoile</i>	Bougainville Reef, Great Barrier Reef	Crossed the Pacific then west from the New Hebrides towards the east coast of Australia, but turned away at Bougainville Reef, about 200 km east of Cooktown. The first European encounter with outliers of the Great Barrier Reef. Bougainville 2002.
1770	James Cook	<i>HM Bark Endeavour</i>	East coast, Cape Howe to Cape York	Beaglehole 1955; Parkin 1997.
1772	Marc-Joseph Marion Dufresne	<i>Le Mascarin</i>	Tasmania	First European to establish contact with Tasmanian Aborigines (though one was killed). Charted section of east coast of Tasmania, including Maria Island. Howgego 2003; Duyker 1992.
1772	Louis François Alléno de Saint-Allouarn	<i>Gros Ventre</i>	Cape Leeuwin to Shark Bay and Melville Island	Separated from Kerguelen-Tremarec at Kerguelen Island, Saint-Allouarn sailed east to Cape Leeuwin area, then coasted north to Shark Bay, where he claimed possession for France and buried a proclamation on Dirk Hartog Island, then coasted north to about Melville Island. Howgego 2003.
1773	Tobias Furneaux	<i>HMS Adventure</i>	Tasmania, Bass Strait (Furneaux Islands)	Part of Cook's 2 <sup>nd</sup> voyage. Charted the east coast of Tasmania and the Furneaux Islands. Furneaux 1969; Howgego 2003.
1788	Arthur Phillip	<i>HMS Sirius</i> , <i>HMS Supply</i> , 9 merchant vessels	Botany Bay, Port Jackson	First fleet, first intentional European habitation and settlement in Australia. <i>History of NSW</i> vol. 1, etc.
1788	Jean-Francois de Galaup Comte de Lapérouse	<i>L' Astrolabe</i> and <i>Bussole</i>	Botany Bay	Arrived at Botany Bay soon after the First Fleet. Sailed off not to be found until 1828 in the New Hebrides. His discoveries north of Sydney are unknown. Feeken & Feeken 1970; Howgego 2003.
1788-89	William Bligh	<i>HMS Bounty</i> , <i>Bounty</i> launch	Tasmania, Barrier Reef, Torres Strait	Visited Tasmania en route to Tahiti. After <i>Bounty</i> Mutiny, sailed boat west and crossed the Barrier Reef at 12°46'S and passed up the coast and by a new passage through Torres Strait, north of Thursday Island. Feeken & Feeken 1970; Howgego 2003.
1789	John Henry Cox	<i>Mercury</i> (aka <i>Gustaf III</i> )	Tasmania	A nominally Swedish expedition to exploit NW coast of America, called at and charted small part of southern Tasmania /Maria Island. Mortimer 1791; d'Entrecasteaux 2001.
1791	Edward Edwards	<i>HMS Pandora</i> , <i>Pandora's</i> boat	Barrier Reef, Torres Strait	Returning with some of the <i>Bounty</i> mutineers from Tahiti, <i>Pandora</i> charted a northerly stretch of the Barrier Reef east of Torres Strait, then was wrecked on the Reef. The survivors sailed to Timor in the boats. Feeken & Feeken 1970; Howgego 2003.
1791	George Vancouver	<i>HMS Discovery</i> and <i>HMS Chatham</i>	King George Sound, Recherche Archipelago	Claimed possession of the south coast for Britain at King George Sound. Feeken & Feeken 1970; Howgego 2003.
1791-92	John McCluer	<i>Panther</i> and <i>Endeavour</i>	Arnhem Land coast	East India Company captain and hydrographer, McCluer surveyed in Palau and New Guinea before returning west to Benkulen via northern Australian coast. Howgego 2003.



DATE	EXPLORER	SHIP	REGION	NOTES /SOURCE
1792-93	Joseph-Antoine Bruni D'Entrecasteaux	<i>Recherche and Esperance</i>	Cape Leeuwin to Head of the Bight, Tasmania	Named Recherché Archipelago and Esperance Bay. Observation and garden set up at Recherché Bay, Tasmania. Feeken & Feeken 1970; Howgego 2003; Horner1995; Duyker & Duyker 2001.
1792	William Bligh	<i>HMS Providence and Assistant</i>	Tasmania and Torres Strait	Visited Tasmania en route to Tahiti on second breadfruit voyage. Passed through Torres Strait by a new route on his return voyage. Feeken & Feeken 1970; Howgego 2003.
1795-96	George Bass and Matthew Flinders	<i>Tom Thumb</i> (x2)	NSW Illawarra coast	Two voyages south of Sydney in small boats, both called <i>Tom Thumb</i> . Howgego 2003.
1797	Guy Hamilton	<i>Sydney Cove</i>	Preservation Island, Bass Strait	Wrecked on Preservation Island, and three men survived trip to near Wollongong, where picked up by boat. Major impetus for charting of Bass Strait.
1797-98	George Bass	whaleboat	Bass Strait	Discovers Western Port. Howgego 2003.
1798-99	Matthew Flinders and George Bass	<i>Norfolk</i>	Bass Strait, Tasmania, southern Queensland	Circumnavigated Tasmania. Without Bass, but with Sydney Aboriginal man Bungaree, Flinders then surveyed the southern Queensland coast in <i>Norfolk</i> . Feeken & Feeken 1970; Howgego 2003; Flinders 1966.
1800-01	John Grant	<i>Lady Nelson</i>	Bass Strait, NSW coast	The first ship to have passed through Bass Strait from the west, naming Mount Schanck (after the designer of the ship), Mount Gambier and Cape Otway among others. On arrival in Sydney, Grant was sent again to Bass Strait to refine his rough survey. During this trip Ensign Barallier made the first detailed charts of the area, surveying Western Port Bay to Wilson Promontory. Grant also surveyed many sections of the NSW coast, including the mouth of the Hunter River. Feeken & Feeken 1970; Lee 1915.
1801	Peter Heywood	HM Bomb Vessel <i>Vulcan</i>	Vulcan Point (later Vulcan Island by King), Kimberley	Midshipman of Bligh's <i>Bounty</i> mutiny, became naval surveyor, visited Kimberley coast from Amboina. Hordern 1997.
1802	John Murray	<i>Lady Nelson</i>	Bass Strait	Murray succeeded Grant, and was sent yet again to survey the Bass Strait and Victorian coast. He discovered Port Phillip, and encountered Aborigines there. He claimed possession there on 8 March 1802. Feeken & Feeken 1970.
1801-02	Thomas Nicholas Baudin	<i>Geographe and Naturaliste</i>	WA coast, Geographe Bay to Bonaparte Archipelago; south coast, Bass Strait to Cape Leeuwin, SE Tasmania	Ships separated at Geographe Bay, and undertook independent surveys of the WA coast (especially Shark Bay) before final rendezvous at Timor. After survey work in Tasmania, Baudin surveyed the south coast westward as Flinders sailed east, and they met at Encounter Bay. The two ships re-united in Sydney. <i>Naturaliste</i> returned to France, while Baudin in <i>Geographe</i> surveyed along the south coast. Feeken & Feeken 1970.
1801	Louis-Claude de Freycinet	<i>Naturaliste</i>	Shark Bay, Tasmania, South coast	Undertook surveys as cartographer and surveyor in Baudin's expedition, and later commander of the tender <i>Casuarina</i> , purchased in Sydney in 1802. Feeken & Feeken 1970.



DATE	EXPLORER	SHIP	REGION	NOTES /SOURCE
1801	Jacques Felix Emmanuel Hamelin	<i>Naturaliste</i>	Shark Bay, Tasmania	Undertook surveys as captain of <i>Naturaliste</i> in Baudin's expedition. Feeken & Feeken 1970.
1801-03	Matthew Flinders	<i>HMS Investigator</i>	NSW, Qld, Gulf of Carpentaria, Bight, SA Gulfs, Bass Strait	The most extensive detailed coastal surveys undertaken to that time. Flinders 1966; Feeken & Feeken 1970.
1810	Frederick Hasselburg	<i>Perseverance</i>	Macquarie Island	Discovered Macquarie Island while on a sealing voyage to the sub-Antarctic for Sydney merchant Robert Campbell. Discovered Campbell Island soon after.
1816	João Joaquim de Freitas	<i>Correio da Azia</i>	South of Point Cloates, WA	Portuguese dispatch ship, wrecked south of Point Cloates on journey from Lisbon to Macau. Survivors sailed boat to Macau, and <i>Emillia</i> brigantine sent to search for wreck. Wreck site located 2004. WA Museum information.
1818	Louis-Claude de Freycinet	<i>L'Uranie</i>	Shark Bay	Sent to continue Baudin's exploration work. Freycinet removed Vlamingh's 1697 plate and took it to France. Feeken & Feeken 1970.
1818-22	Phillip Parker King	<i>Mermaid, Bathurst</i>	Hervey Bay around the north coast to Cape Leeuwin, Tasmania	King undertook four years of survey work filling in gaps left by Flinders' surveys. Hordern 1997; Feeken & Feeken 1970.
1820	Thaddeus Bellinghausen	<i>Vostok and Mirnyi</i>	Macquarie Island	Charted a running survey of the island and produced a map. Cumpston 1968.
1822	William Langdon	<i>Lusitania</i>	Macquarie Island	Charted east coast and named Lusitania Bay, Buckles Bay, North Head and other locations. Cumpston 1968.
1831-32	John Biscoe	<i>Tula and Lively</i>	AAT, Cape Ann and Enderby Land	First to clearly demonstrate that Antarctica was a substantial land mass. Martin 1996.
1833	Peter Kemp	<i>Magnet</i>	Heard Island? AAT	Possible sighting of Heard Island, and sighting of mainland at Kemp land.
1837-43	John Clements Wickham and John Lort Stokes	<i>HMS Beagle</i>	North-west Australia, Bass Strait	Carried out detailed survey of many gaps in coastal surveys by earlier expeditions, refining surveys for commercial shipping, and discovered some of the major northern Australian rivers. Hordern 1989.
1839	John Balleny	<i>Eliza Scott and Sabrina</i>	Balleny Islands (not AAT) and Sabrina Coast	Sighted the islands and mainland Antarctica. Swan 1961. Swan 1961; Martin 1996.
1840	Dumont d'Urville	<i>Astrolabe and Zelee</i>	Terra Adelie	Landed on Terra Adelie, between sectors of the AAT. Martin 1996.
1840	Charles Wilkes	<i>Vincenne, Porpoise, Peacock, Flying Fish</i>	Wilkes Land	Disputed sighting of the Antarctic continent. Swan 1961; Martin 1996.
1842-45	Francis Price Blackwood and Charles Yule	<i>HMS Fly and HMS Bramble</i>	Coral Sea, Great Barrier Reef and Torres Strait	Blackwood undertook, with Charles Yule in <i>Bramble</i> , detailed survey of the Queensland coast, and the islands and reefs of the Barrier Reef and Torres Strait, and New Guinea (e.g. Fly River). Blackwood erected the surviving stone beacon on Raine Island in 1844. Feeken & Feeken 1970.



DATE	EXPLORER	SHIP	REGION	NOTES /SOURCE
1846-50	Owen Stanley and Charles Yule	<i>HMS Rattlesnake</i> and <i>HMS Bramble</i>	Torres Strait and New Guinea	Continued the survey work of Blackwood and Yule. Yule retained command of <i>Bramble</i> as <i>Rattlesnake's</i> tender. Company members included T. L. Huxley and Oswald Brierly. Surveys were in part to make navigation safer for the increasing steamship operations in the Inner Passage, a triangulation survey of the area between the coast and the reef being undertaken. Lubbock 1968; MacGillivray 1852.
1852-1861	Henry Mangles Denham	<i>HMS Herald</i> and <i>HMS Torch</i>	Australia and the SW Pacific	While the main emphasis of the <i>Herald's</i> work was in the south-west Pacific, detailed survey was also undertaken in Bass Strait, Shark Bay, Lord Howe Island, Sydney Harbour, King George Sound, the Great Barrier Reef, and the outer route through the Coral Sea. David 1995.
1853	John Heard	<i>Oriental</i>	Heard Island	Re-discovered Heard Island, and published its location.
1881	various	<i>HMS Lark</i> and <i>HMS Alert</i>	Queensland and New Guinea	Admiralty surveys.
1883-1904	Many commanders	<i>HMS Dart</i>	Barrier Reef, Tasmania, New Guinea and SW Pacific	The <i>Dart</i> had some distinguished commanders, including three future hydrographers of the Royal Navy: A. M. Field, C. Purey-Cust, and J. F. Parry, hydrographer during WWI and grandson of W. E. Parry, the Arctic explorer, hydrographer and Commissioner of the Australian Agricultural Company. She operated in concert with <i>HMS Alert</i> , <i>HMS Lark</i> and Queensland Colonial gunboat <i>Paluma</i> . Bastock 1988.
1890-1907	Many commanders	<i>HMS Penguin</i>	Australian coast, Great Barrier Reef, Solomons, New Hebrides, Fiji and New Zealand	Continued the Admiralty survey program in Australia and the south west Pacific. Bastock 1975.
1906-24	Many commanders	<i>HMS Fantome</i> (HMAS <i>Fantome</i> from 1915)	Queensland, Torres Strait, Northern Territory, New South Wales, Tasmania, New Guinea, and the Great Barrier Reef	The <i>Fantome</i> operated for the Admiralty in WA and Tasmania, with a period as an Australian warship during WWI. Bastock 1975. Her survey partner was <i>HMS Sealark</i> from 1910 to 1914.
1911-14	Douglas Mawson	<i>Aurora</i>	Commonwealth Bay and Queen Mary Land, AAT	Sledge surveys from two winter bases, covering over 1,100 km of coast. Mawson 1934.
1921-1927	K. MacKenzie & H.T. Bennett	HMAS <i>Geranium</i>	Australian coast	First vessel of the RAN Surveying Service.
1925-46	Many commanders	HMAS <i>Moresby</i>	Barrier Reef, northern Australia and Western Australia, New Guinea	Surveyed in conjunction with other survey ships including HMAS <i>Geranium</i> . Gillett 1983; Bastock 1975.
1929-31	Douglas Mawson	<i>Discovery</i>	AAT	BANZARE charted between 45° E and 108° E in two seasons. Jacka & Jacka 1988.



DATE	EXPLORER	SHIP	REGION	NOTES /SOURCE
1934	Lars Christensen	<i>Thorshavn</i>	Princess Astrid Land, AAT	Norwegians Christensen and later Mikkleson made claims to have charted Astrid Coast and Vestfold hill area, already charted by Mawson in BANZARE. Swan 1961.
1946-47	Operation Highjump	Various	AAT	Charted by air and ship-based survey and air photographed 60% of Antarctic continent, 25% of it previously unseen.

Table 1 gives a timeline of exploration and survey of the coastline.





# 3

## TERRA AUSTRALIS INCOGNITA BECOMES NEW HOLLAND: 1606-1767

### EUROPEANS TO AUSTRALIA'S NORTH

The lure drawing the Portuguese, Spanish and Dutch seafarers to the South-East Asian region was spices. In an age before refrigeration, spices were eagerly sought in Europe because they provided flavour that added zest to often bland ingredients, and in some cases aided in food preservation and masked tainted food. The Spice Islands, first reported by Arab traders who transhipped nutmeg and cloves from there to European traders further to the west, were centred on the Moluccas, and exploration in the region was primarily for the purpose of finding new sources of spice.

The Portuguese secured their direct access to the Moluccas spice trade through the voyage to Malacca, the key transshipment port for the trade, by Diogo Lopes de Sequeira in 1509, the capture of Malacca by Afonso de Albuquerque in 1511, and the exploration of the islands themselves by Antonio de Abreu in 1512.<sup>54</sup> The Portuguese then settled down to exploitation of the new-found wealth of the East Indies.

The Spanish were diverted in their exploration of the East by the discovery of America and did not reach the Spice Islands until Magellan's ships crossed the Pacific and landed there in 1521. After the return of Magellan's surviving ship laden with spices, Spain sent Juan Sebastián del Cano and García Jofre de Loaisa back to the Moluccas in 1525.<sup>55</sup> The Spanish and Portuguese clashed over control of the islands, the rival claims being resolved by the Treaty of Saragossa in 1529, whereby the Portuguese gained the Moluccas and Spain the Philippines.

Magellan's voyage across the central Pacific to the Philippines and Moluccas (1519-21) left the question of the existence of Terra Australis Incognita in the South Pacific unanswered. The Spaniard Álvaro de Mendaña sailed from Callao in Peru to the Solomon Islands in 1567, and returned in 1595 with Pedro Fernández de Quirós to discover for Europe the Marquesas and the Santa Cruz Islands, south-east of the



Solomons. Quirós returned to the western Pacific in 1605 with Luiz de Váez de Torres, and believed he had reached the southern continent (his ‘Austrailia del Espirito Santo’) when he located the islands of Vanuatu (New Hebrides). Torres, however, having split from Quirós, continued north-west, demonstrating the absence of land there, and passed through the strait named after him between Australia and New Guinea, demonstrating that New Guinea was an island. However, information about the existence of the strait was not released by Spain, and was not finally confirmed until Cook’s voyage through it in 1770.

## THE DUTCH

The Republic of the United Netherlands was formed in 1579 when the seven northern provinces of the Low Countries—Gelderland, Holland, Zeeland, Utrecht, Friesland, Overijssel and Groningen—joined together in the Union of Utrecht. The provinces had been in revolt against Spain since 1568, and two years after its formation the republic renounced its allegiance to the Spanish Crown, which, under Phillip II, who also became king of Portugal in 1580, had closed the port of Lisbon to Dutch ships, thereby excluding Dutch merchants from the spice trade. The new republic waged commercial and colonial war on Portugal’s (and Spain’s) overseas empire during the late 16<sup>th</sup> century. The chief targets were Portugal’s settlements in Asia, Africa and Brazil, and sporadic attacks continued until the Treaty of Munster in 1648 ended the Eighty Year War between the rival states. In simplified terms, the Dutch won in Asia, the Portuguese in Brazil, and in West Africa there was a draw.<sup>56</sup>

The Dutch ‘United East India Company’ (Verenigde Oostindische Compagnie, or VOC) was founded in 1602 to pursue Dutch interests in the East in a united way—cloves, mace and nutmeg from the Moluccas, cinnamon from Ceylon, and pepper from Malabar. In the course of the war, the Dutch imposed a nutmeg monopoly on the Banda Islands in 1602, established a factory in Bantam in 1603, and a protectorate over Amboina in 1605, thereby capturing the chief Spice Islands, though the Spanish re-occupied Tidore and part of Ternate from 1606 to 1662, and the Portuguese withdrew to Macassar, from where they continued to export spices under the protection of the local Muslim rulers until finally expelled by a Dutch expedition in 1667. The VOC established its headquarters in Batavia in 1619. Portugal retained its last vestiges of influence on Timor, Solor and Flores, where sandalwood was the main export, and at Macao and Goa.<sup>57</sup>

As soon as the VOC had established its foothold in the East Indies, it undertook the exploration of New Guinea, the north coast of which had been seen by the Spanish as early as 1526, ‘and other east and south-east lands’. The first Dutch exploration of Australia in 1606 took place in the context of the Dutch domination of the Spice Islands, and within half a century the Dutch had explored the entire north and west Australian coasts, and a large proportion of the southern coast.<sup>58</sup>

### *Jansz and the Duyfken*

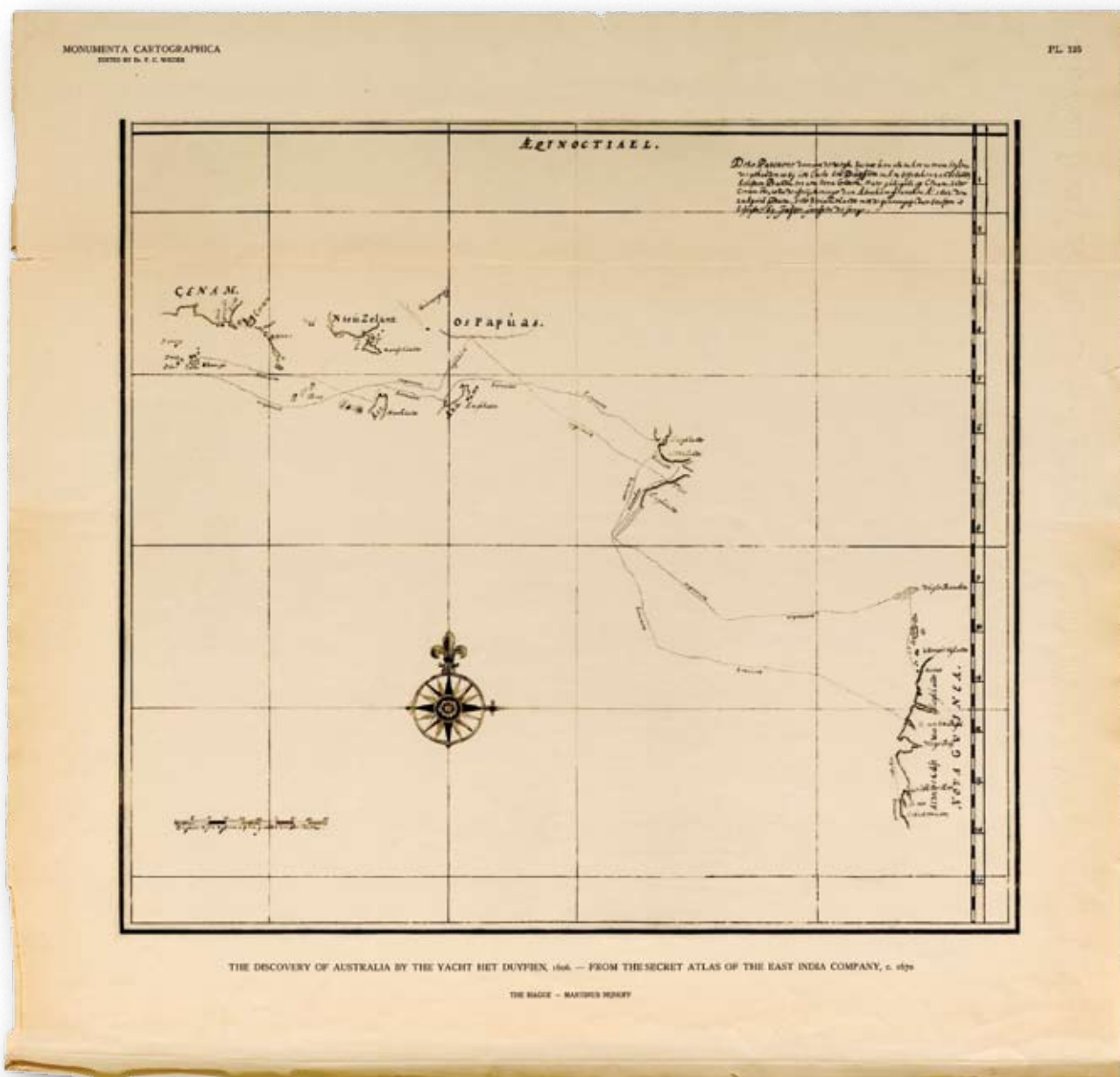
The head of the Bantam factory in Java, Jan Willemsz Verschoor, sent Willem Jansz in the yacht *Duyfken* on the first exploration venture. Though Jansz’s journal is lost, his voyage can be reconstructed from his chart and information recorded by others



The Jansz chart. "Discovery of Australia by the yacht Het Duyfken 1606" – from the Secret Atlas of the East India Company, c.1670, Plate 125, volume 5, from "Monumenta Cartographica: Reproductions of unique and rare maps, plans and views in the actual size of the originals: accompanied by cartographical monographs" edited by Frederick Casper Wieder, published by Martinus Nijhoff, the Hague, 1925-1933.

National Library of Australia

(see the map of the *Duyfken's* route below). Jansz followed the southern coast of New Guinea, looking for places of commercial possibility, until he was diverted to the south by the shoals of Torres Strait, in the early months of 1606. Thinking the shoals lay off low-lying land, but indicating they could mask a passage, Jansz continued south until he met visible land again on the west coast of Cape York Peninsula, probably in the vicinity of the Pennefather River. The *Duyfken* continued 380 km down the east coast of the Gulf of Carpentaria to Cape Keerweer (Turnagain), from where he retraced his route north. At Port Musgrave, at the mouth of the Wenlock River (named by the Dutch Carpentier or Batavia River), one of the *Duyfken's* crew was fatally speared by an Aboriginal, the first fateful recorded contact between Aborigines and Europeans.<sup>59</sup>





About six months after Jansz's voyage, sometime between August and October 1606 (accounts vary), the Spaniard Luis Váez de Torres passed through the strait that now has his name, in the *San Pedrico* (formally *San Pedro*) and the smaller tender *Los Tres Reyes*.

Torres, who had accompanied Quirós through the Solomon Islands (described above), probably also had violent contact with Indigenous people, this time the Torres Strait Islanders. Along his route through the western Pacific, Torres kidnapped 'twenty persons of different peoples, in order with them to give a better account to ...[the Spanish King]... although up to now they do not make themselves understood well'. It is probable that this human collection included Torres Strait Islanders.<sup>60</sup> Torres probably sighted Cape York, but did not recognise it as a continent, and his account remained generally unknown to seamen for over 150 years.<sup>61</sup>

Jansz's account of the Cape York Peninsula coast did not promise commercial gains, so his voyage was not followed up. The next series of Dutch contacts with the continent occurred on the Western Australian coast. The Dutch initially followed a route from Cape of Good Hope to the East Indies that swung through the northern Indian Ocean, but in 1611 Henrick Brouwer established another route, following the reliable winds along latitude 35°S eastward to the estimated longitude of Java, then heading north. Brouwer's route became the standard one from 1617.<sup>62</sup> As we have already seen, there was no reliable method of determining longitude, which meant that the use of this route inevitably led to ships sighting, and being wrecked on, the Western Australian coast. Brouwer's route was also used by mariners who intentionally approached the coast.

### ***Dirck Hartog and early accidental visitors***

Dirck Hartog (or Dirck Hartochsz, Dirk Hartogszoon— 'Dirk' is used below where that form is adopted by modern place names) was the first to encounter the west coast, in October 1616, when he followed the Brouwer route too far east and made three landfalls at about 22°, 23° and 25°S, a section of the coast later called Eendrachtslandt after Hartog's ship the *Eendracht*. Hartog landed on Dirk Hartog Island at Shark Bay, and erected a record of his visit in the form of a pewter plate, recovered by de Vlamingh in 1696 and now in the Rijksmuseum in Amsterdam. This is the earliest known relic of European mariners known to exist. De Vlamingh replaced the plate with a copy, adding the record of his own visit.<sup>63</sup>

Others were to inadvertently follow Hartog's lead over the subsequent years, fetching up against the Western Australian coast by accident. In May 1618 Haevick Claessoon in the *Zeewolf* hit the coast in latitude 21°20'S, but did not land. In July of the same year, Lenaert Jacobszoon (or Jacobsz) in the *Mauritius*, with Willem Jansz as supercargo, struck the coast near North West Cape, and named it the Willems River. Frederick de Houtmann in the *Dordrecht* and *Amsterdam* in 1619 sighted but did not land on Rottnest Island, and sighted and charted the 'Abri voll olos' ('beware; keep your eyes open') or Abrolhos Islands. The ship *Leeuwin* (master unknown) in 1622 sighted what was later named Cape Leeuwin by Matthew Flinders, the south western point of the mainland being recorded in Dutch charts in 1627.<sup>64</sup> Also in 1622, the crew of the *Trial* became the first Englishmen to be lost on the Australian coast. This is described in the following section (see Hessel Gerritsz' 1618 chart showing Dutch discoveries, below).



right: *Cape Inscription,  
Dirk Hartog Island*  
Photo: Patrick Baker, Dept of  
Maritime Archaeology, Western  
Australian Museum

below: *The inscribed pewter plate  
left at Cape Inscription by Dirk  
Hartog in 1616.*  
Photo: Patrick Baker, Western  
Australian Maritime Museum



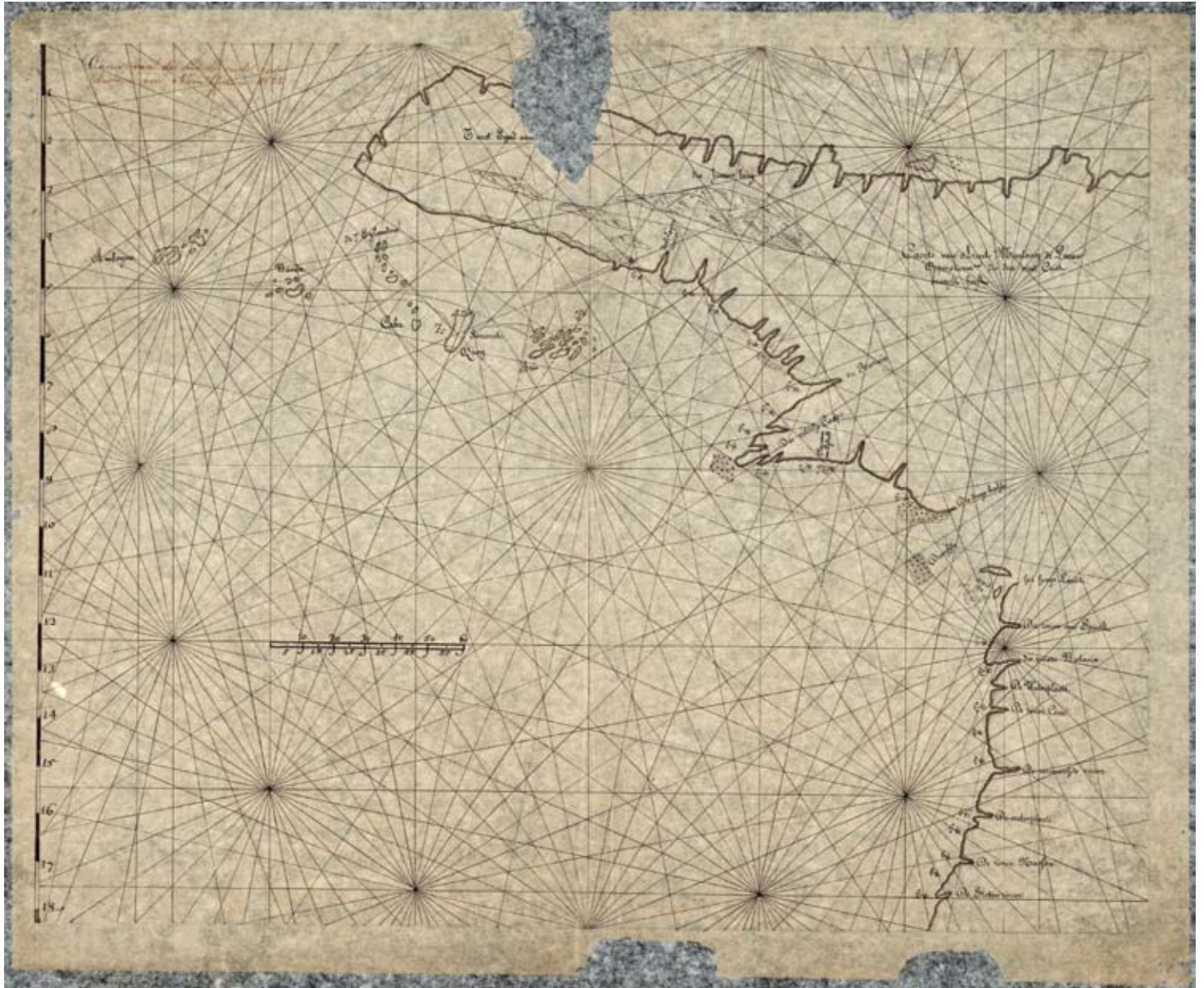
These early accidental sightings helped establish the form of the west coast of New Holland, but they did not accurately chart it, and added little to the sum of knowledge about the continent. In the wake of the loss of the *Tryall*, and the series of near misses by VOC ships, the VOC equipped the *Hazewind* and *Haring* in 1622 to chart the west coast, under the command of Jan Vos. However, the ships were diverted to help two VOC ships in distress in the Sunda Strait, and lost the favourable sailing season.<sup>65</sup>

### ***The Pera and Arnhem***

The voyage of Jan Carstensz and Willem Joosten van Colsterdt (or Colster) in the *Arnhem* and *Pera* in April and May 1623 was to try to advance knowledge of the coast, mainly for commercial advantage. Carstensz was sent by the Governor of Ambon to explore further the coasts of New Guinea and the Southland. The master of the *Arnhem*, Dirk Melisz, and nine crew were killed by Papuans, and Colsterdt took over as master of the ship. The ships repeated Jansz's 1606 route across the western entrances to the Torres Strait, considered exploring the shoals and reefs of the area of what he called 'Dry bight' too dangerous to be worthwhile, and entered the Gulf of



Carpentaria. Carstensz named the eastern coast of Cape York Peninsula 'Carpentier' after the Governor-General of the VOC, the name afterwards being applied to the gulf rather than the coast (see the following map).



The ships continued a close observation of the coast south past Cape Keerweer, to the Staaten River (probably the Gilbert River).

Carstensz's journal of the *Pera* survives, detailing seventeen landings or attempted landings on the coast to take on water or assess the local resources.<sup>66</sup> On nine of the landings Aborigines were encountered, in groups of up to 200 people, and Carstensz made the earliest European observations of Aboriginal technology and economy. He concluded they had nothing to offer for trade, and described them thus:

'These people are pitch-black, lean of body and totally naked, with a little knitted basket of net around their head, and further in their hair-style and appearance like the blacks from the Coast of Coromandel, but, as it seems, not as cunning, bold and ill-natured as the blacks on the west coast of Nova Guinea...'<sup>67</sup>

*A manuscript copy of a map of the discoveries made by the 'Pera', made by Arent de Leeuw on the 1623 Carstensz's expedition to New Guinea and the Gulf of Carpentaria.*

National Library of Australia



However, Carstensz had been instructed to bring home some native people, and efforts to achieve this soon demonstrated that the Aborigines were not as compliant as he first thought. The day after the crew seized a man and dragged him off, a party landing for wood were confronted by ‘...a crowd of blacks, surely more than 200 men arrived, having prepared themselves down to the smallest detail to surprise our men and to beat them up, so that necessity forced us to fire twice, after which they ran and fled because one was hurt and had fallen down...’

The expedition was running short of water and wood, and near the Staaten River (probably the Gilbert River), Carstensz decided to turn around. He nailed to a tree a board inscribed to mark their arrival, and ventured some distance inland to inspect the country. At this point Colsteerdt, whose *Arnhem* was in poor condition, decided that the intended long return route back up the coast was not in his best interests, and deserted the expedition, heading north-west across the Gulf, making two sightings on the western side, which he named the Arnhem (De Caep Hollandie, now Cape Arnhem) and van Speult Islands.

Carstensz continued back along the coast, stopping each day to try to find water, and named the Nassau River, the Coen River (now the Archer River), and the Carpentier River (Jansz’s Batavia River), before returning to Ambon via the New Guinea coast. He persisted in trying to kidnap an Aboriginal, and when he seized one, an Aboriginal man was shot dead in the ensuing confrontation. At Carpentier River (Wenlock River), where Jansz had lost a crew member to an Aboriginal spear, Carstensz was again met by ‘200 men’ and again his musketeers were ‘forced’ to open fire, killing one man who had on him a piece of metal Carstensz assumed had come from the *Duyfken*. The *Pera* sailed on and reached Amboina without further incident.

### ***Other Dutch visits in the 1620s***

The ship *Leiden* visited Australia’s shores twice, in 1623 and 1626. On the first of these visits (with Klaas Hermanszoon as master) the first birth of a European baby in Australian waters was recorded, near Shark Bay, named Seebaer van Niewlant (‘Seabirth of Newland’) Jansz. On its second visit under the command of Daniel Cock, the *Leiden* followed the coast from the vicinity of Zuytdorp Cliffs north to Dirk Hartog Island.<sup>68</sup>

Other ships to reach this area of the west coast were the *Torteldoyff*, which gave its name to the Turtledove Shoal south of the Houtman Abrolhos in 1624, and the *Wapen van Hoorn*, which touched at Shark Bay en route to Batavia in 1627, and whose commander, David Pieterszoon de Vries, revised Hartog’s chart of that area. Another to reach this destination was the *Galias*, which, carrying Governor-General Coen to Batavia in 1627, was with its companions the *Utrecht* and *Texel* nearly wrecked on the Houtman Abrolhos Islands due to a collision of the ships. This near-disaster prompted a call for the charting of the coast by the VOC.<sup>69</sup>

Of more lasting fame, because his name was applied to a section of the coast, was Gerrit Frederikszoon de Witt, who in 1627 reached and followed the coastline between about the vicinity of Port Headland and the Montebello Islands in the *Vyanen*, nearly being wrecked in the process.<sup>70</sup>



### ***The Gulden Zeepaard and the Batavia***

The most famous and influential Dutch visits of the 1620s, however, were the exploration of the south coast by the *Gulden Zeepaard* in 1627, and the loss of the *Batavia* in 1629.

The *Gulden Zeepaard*, under the command of Francois Thijssen, sailed east from the Cape of Good Hope, and sighted the Australian coast at Point Nuyts, near the present town of Walpole in WA. Thijssen then sailed eastward, past the Recherche Archipelago and along the cliffs of the Nullabor Plain, and charted 1500 km of coastline as far as the Nuyts Archipelago, off Ceduna in South Australia (see the following map). Nuyts' name was applied to the archipelago and the adjacent land because of his position as the senior Dutch official aboard (he was on his way to take up the position of governor of Formosa and Ambassador to Japan). This voyage defined the majority of the southern coast of Australia, and dispelled any theory that it was directly linked to Antarctica. Its discovery stimulated political and literary imaginations: Jean Pierre Purry proposing a Dutch colony on the mainland there in 1717-18, and Jonathon Swift placing his Lilliput and Blufescu near the Nuyts Archipelago in his *Gulliver's Travels* in 1727.<sup>71</sup>



*Hessel Gerritsz's chart of the Malay archipelago and the Dutch discoveries in Australia, dated 1618, but believed to have been published after 1628 as discoveries after 1618 were only added to the engraving plate after 1628.*

National Library of Australia





above: The Houtman Abrolhos Islands off the coast of Western Australia. The *Batavia* was wrecked on Morning Reef where waves are breaking on the left side of the photo. Beacon Island, where the massacre of survivors took place, is to the right centre of the photo.

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above, right: Divers from the Western Australian Maritime Museum on the *Batavia* wreck.

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Perhaps the Dutch voyage best known to most Australian's is that of the *Batavia*, due to the bloody and dramatic events that followed the wrecking of the ship on the Houtman Abrolhos Islands in 1629. Passing through Cape of Good Hope en route for Batavia, the Master, Adriaen Jacobszoon, who had a long-standing quarrel with Fleet President Francois Pelsaert, conspired with others to mutiny. However, the fleet got separated and the *Batavia* drove on alone across the southern Indian Ocean, running aground on Morning Reef in the Houtman Abrolhos Islands on June 4 1629. Of the 270 (or 290) passengers and crew, Pelsaert left 70 men on the wreck and landed the rest on the nearby islands, before heading to the mainland in search of water.

Pelsaert and his men saw Aborigines and termite mounds, but no water, and on 16 June he and the 47 men aboard the boat headed north and reached Batavia on 8 July. Governor-General Coen immediately fitted out the *Sardam*, and sent her south to relieve the shipwrecked survivors. Bad weather made for a slow trip, and the *Sardam* did not reach the Houtman Abrolhos until September 13, 14 weeks after the wreck. Pelsaert found a desperate scene. After Pelsaert had left, under-merchant Jeronimus Cornelisz had led a plot to capture the boat or any ship coming to rescue them, and sail away in it. To ensure success he led a campaign of terror to remove those who might side with Pelsaert or the rescuers. On the pretence of distributing the survivors more evenly among the small islands, Cornelisz separated groups of passengers and crew, and many were murdered before or as they landed. The figures given in the various accounts do not agree, but most state that 125 men, women and children were murdered, while another 40 or 60 were drowned when the ship broke up. The worst excesses occurred on the island then named 'Batavia's Graveyard', and now Beacon Island.

A group of soldiers had been sent by Cornelisz to High Island, and under the leadership of Wiebbe Hayes they erected a walled enclosure of stone as a defence against the Cornelisz faction (which still survives, the oldest European structure in Australia). Luckily, the person Pelsaert first met when he sailed into the islands was Wiebbe Hayes, who warned Pelsaert of the plot and the massacre of survivors. Pelsaert landed on the mutineers' island in force, and they surrendered without fight. Nine, including Cornelisz, were executed after a short trial, and the rest returned to Batavia for justice. In all, 74 survivors returned on the *Sardam*. Two mutineers, Wouter Loos and Jan Pellegriksz de Beye, were put ashore on the mainland, probably near the





mouth of the Murchison River, with food and arms and told to explore the land and make contact with the inhabitants, and then after two years to keep watch for a vessel to take them off. They were never seen again, but might be considered Australia's first European residents.<sup>72</sup>

The *Batavia* wreck site was re-discovered in 1963, and archaeologically investigated from 1973-76.

While the *Batavia* wreck did little to advance knowledge of Australia at the time, it served to emphasise the dangers of the west coast, and the relics including the gateway intended for Batavia town, in the Western Australian Maritime Museum collection, are perhaps the most tangible evidence of Dutch maritime heritage in Australia. The wreck is probably more important in the context of the ongoing 'rediscovery' of the stories of the Australian coast than it was in the advancement of knowledge or awareness of the continent.

### ***The Tasman voyages***

During the 1630s the Dutch had further contact with the coast, both intentional and accidental. The *Amsterdam* accidentally reached the coast near Shark Bay in 1635, and in the following year Antonie Caen in the *Banda* touched at Bernier Island, and may have been the first to sight the black swan.

Of more import for advancing the Dutch knowledge of the coast was the voyage of Pieter Piertszoon in the *Klein Amsterdam* and *Wessel* in 1636. Anthonie van Diemen, newly appointed Governor-General of Batavia, renewed efforts to explore and chart the coast of the Southland, the poor knowledge of the coast posing an ongoing threat to the well-being of the VOC's ships. He sent out Gerrit Thomasz Pool in the *Klein Amsterdam* and *Wessel*, and in keeping with the Company's commercial focus, Pieter Piertszoon was sent along as merchant. The main aim was to follow up on the start made by the *Pera* and *Arnhem* over a decade before, by continuing the survey of the coast westward from the Gulf of Carpentaria.

The wider (and clearly overly-ambitious) aims included testing whether Jansz's possible passage through Torres Strait, dismissed by Carstensz, existed or not; searching for the two mutineers marooned by Pelsaert on the west coast; and looking for a re-victualling haven for VOC ships between 26° and 28°S. Pool was killed while on the New Guinea coast, and command passed to Pieterszoon, who carried on, sighting



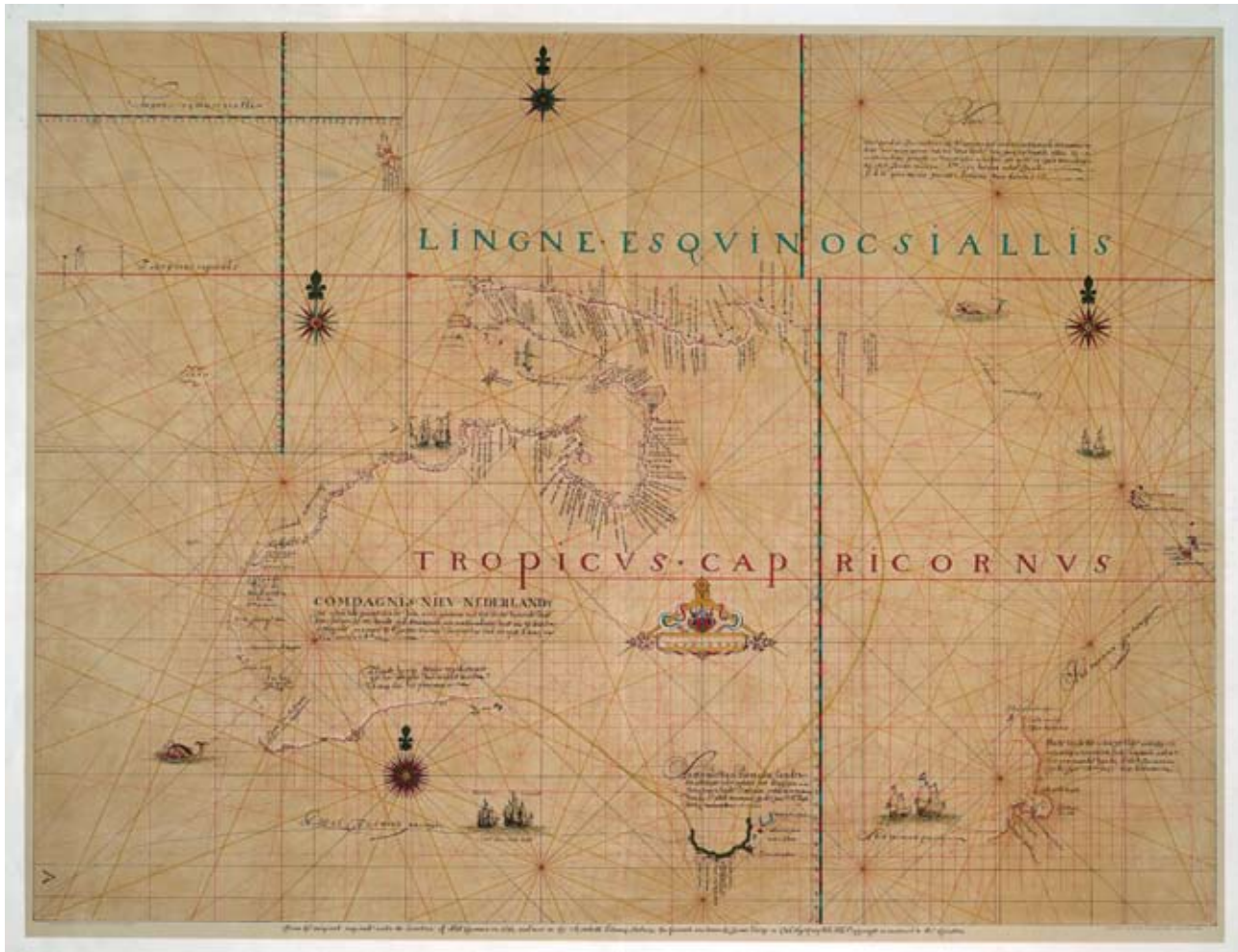
top: One of the walled enclosures built by Wiebbe Hayes and his men on West Wallabi Island to defend themselves from attack by the *Batavia* mutineers.

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above: The stone portico originally destined for the Dutch fort in Batavia, Java, now in the Western Australian Maritime Museum.

Western Australian Maritime Museum





Tasman's map of Australia and New Zealand: from the original map drawn under Tasman's direction in 1644, a facsimile drawn by James Emery in 1946 from the original map held in the Mitchell Library, Sydney. National Library of Australia

the Coburg Peninsula, Melville Island, and on 14 June 1636 identifying the entrance to Dundas Strait, before leaving the coast at Cape van Diemen to return to Java. The region was named Van Diemen's Land and Maria's Land.<sup>73</sup>

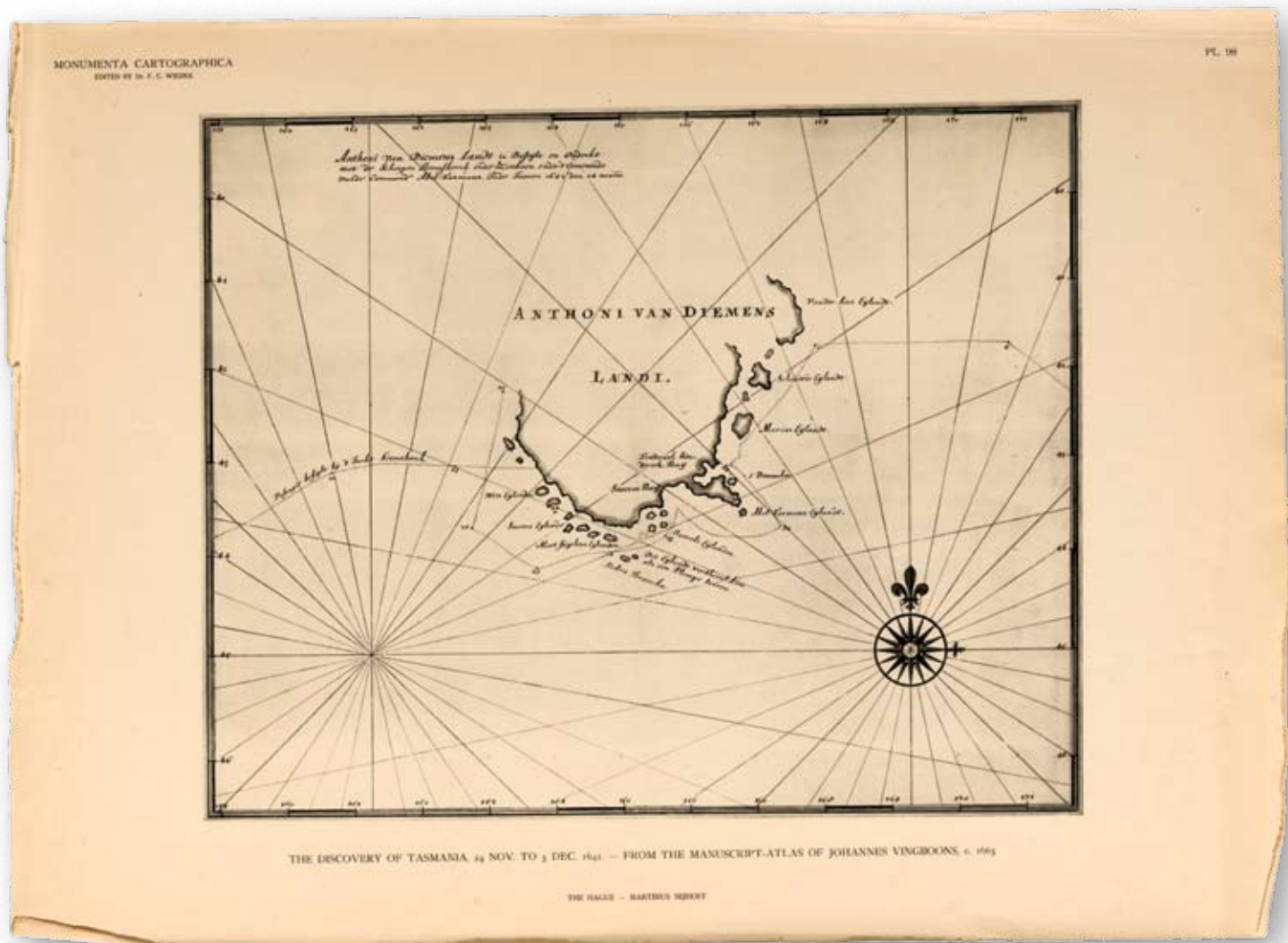
Governor-General Van Diemen maintained his interest in expanding Dutch knowledge of the Southland, and of alternate routes to the Pacific, avoiding the zone of Spanish influence. In 1642 Van Diemen entrusted Abel Janszoon Tasman with a new voyage of exploration. The geographer Franchois Jacobszoon Visscher accompanied Tasman on the voyage as 'steersman-major', to test his theory that a southern continent existed below 50°S. Hence Tasman's route was designed to approach the Southland from high southern latitudes (see the map of Dutch discoveries above). In the *Heemskerck* and *Zeehaen* Tasman sailed first to Mauritius, then across the Indian Ocean and well south of Cape Leeuwin before heading north-east and striking the Tasmanian west coast at about the latitude of Macquarie Harbour. Tasman named it Anthonie van Diemen's Land in honour of the Governor-General. Sighting and naming Mounts Heemskerck and Zeehaen, Tasman followed the coast south and east, naming Maatsuyker, Maria, Schouten and a number of other islands. The ships moored in Frederick Hendrik Bay (now North Bay), landed and raised a flag to take possession on 3 December 1642 (see the chart of Tasman's discoveries below).<sup>74</sup>

On the east coast it was decided to sail east to seek the Solomons, and the west coast of New Zealand was reached and charted, though it was taken to be the western coast of Schouten and le Maire's Staten Landt, off Tierra del Fuego. The expedition returned to the East Indies via the northern coast of New Guinea.



On his return to Batavia, the council of the VOC decided that Tasman had not sufficiently carried out his tasks, and sent him on another expedition in 1644 to establish the relationship between New Guinea, the South Land (i.e. did Torres Strait exist?), Van Diemen's land and the unknown southland (New Zealand). Tasman sailed in the *Limmen*, *Zeemeeuw* and *Bracq* to Banda and the Aru Islands, then around the south coast of New Guinea and across Torres Strait, like his predecessors, not observing a passage to the east. He then proceeded around the entire coast of the Gulf of Carpentaria, passing between Groote Eylandt and the coast, then along the coast of Arnhem Land, the Coburg Peninsula, Melville Island and onwards down the north-west coast to just south of North West Cape, before returning to Batavia. This was the first accurate charting of the entire northern Australian coast.<sup>75</sup>

*Chart of Tasman's discoveries in Tasmania. From "Original Chart of the Discovery of Tasmania by Isaac Gilsemans, Plate 97, volume 4, from "Monumenta cartographica: Reproductions of unique and rare maps, plans and views in the actual size of the originals: accompanied by cartographical monographs" edited by Frederick Casper Wieder, published by Martinus Nijhoff, the Hague, 1925-1933. National Library of Australia*



### ***The loss of the Vergulde Draeck and its aftermath***

The next major Dutch exploration of the western coast was stimulated by the loss of the VOC ship *Vergulde Draeck* in 1656. Commanded by Pieter Albertsz, the *Vergulde Draeck* was on her way to Batavia by the Brouwer route when, on 28 April 1656, she struck a reef off Ledge Point near Cape Leschenault, about 130 km north of Perth.<sup>76</sup>

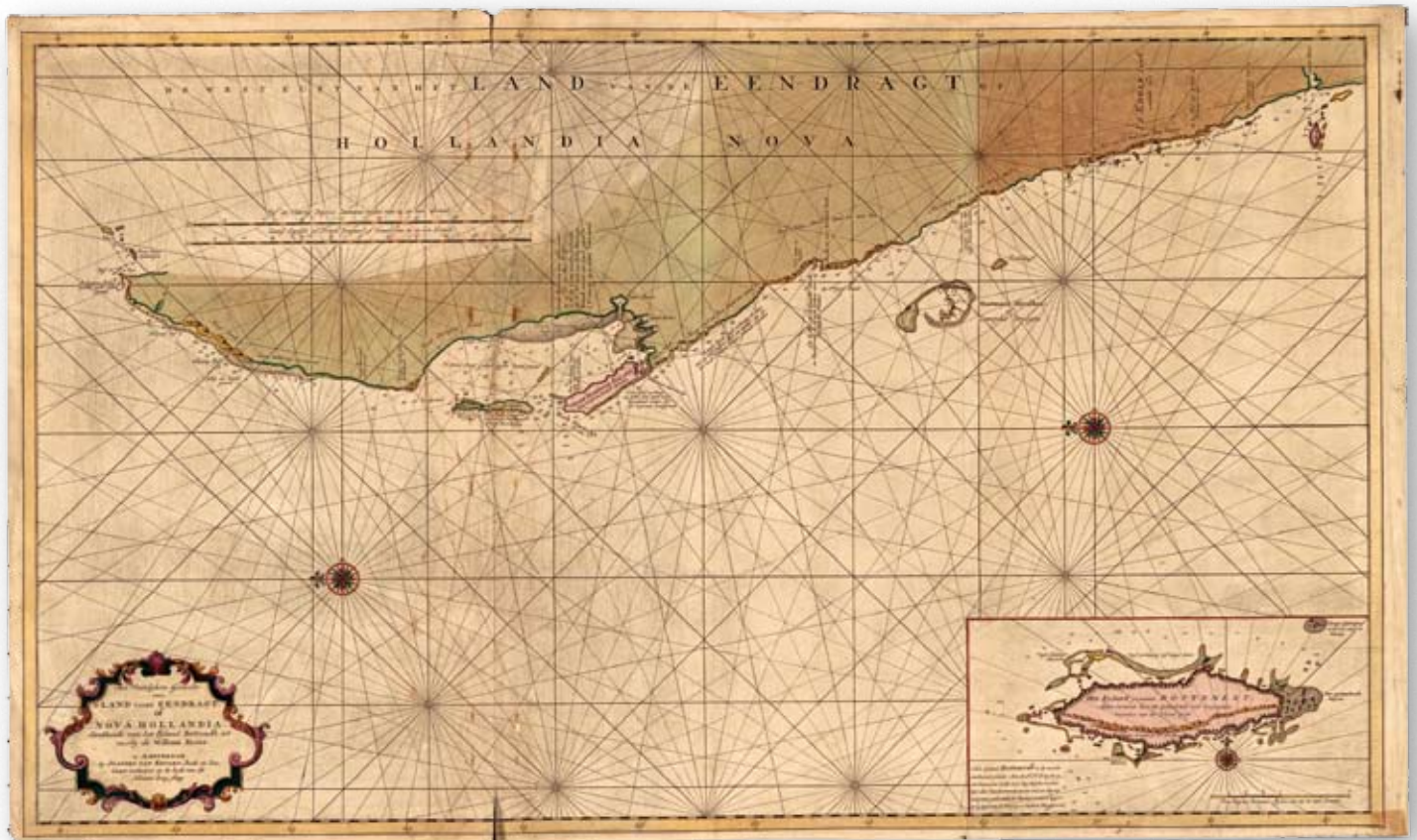
Seventy-five of the approximately 193 passengers and crew aboard reached shore. Albertsz sent the understeersman and six men off in the boat to Batavia for help,



while he stayed ashore with the survivors, probably to avert any chance of repeating the fate that befell the *Batavia* survivors when Pelsaert left them. The boat reached Batavia in 40 days, and a rescue expedition was organised immediately.

The *Witte Valck* and *Goede Hoop* were dispatched the day after the news of the wreck reached Batavia. The ships were separated, the *Witte Valck* having difficulty approaching the coast, while the *Goede Hoop* searched the coast north of the Swan River, losing two men ashore and another eight in a boat accident. Neither ship found any trace of the survivors. A year later the small flute (small supply vessel) *Vinck* and the ship *Veenenburgh* were instructed to search the coast en route from Cape of Good Hope to Batavia, but approached the coast too far north. The *Veenenburgh* appears

Victor Vectorszoon's 1697  
chart incorporating the Dutch  
discoveries by Vlamingh, from an  
edition published by Johannes  
van Keulen in 1753.  
National Library of Australia



not to have reached the coast, while the *Vinck* was prevented from landing by bad weather, leaving the coast after four days. The *Elburg* was similarly diverted to search the coast, with as little success.

In 1658 another search for the ship's valuable cargo of bullion and its missing survivors was organised with the galliots *Waeckende Boey* and *Emerloort*, commanded by Samuel Volckerts and Aucke Pieterszoon Jonck, leaving Batavia in January. The ships separately searched the coast between the Swan River and the Houtman Abrolhos, landing and firing cannon at intervals. Both ships sighted fires and Aborigines ashore, and the *Waeckende Boey* found wreckage, assumed to be from the *Vergulde Draeck*, near Rottnest Island, which was explored, named and charted, and on the mainland to the north. The charting of the coastline resulted also in the first known coastal views of Australia being made, however, they found no sign of the survivors. Fourteen men from the *Waeckende Boey* were abandoned after their boat was thought to have been lost, four of whom made their way back to Batavia.



Coins were found in the dunes near Cape Leschenault in 1931, and the wreck of the *Vergulde Draeck* was relocated in 1963. Excavation was carried out in 1972.

### ***De Vlamingh's voyage***

The next major Dutch exploration of the coast was nearly 30 years after the search for the *Vergulde Draeck*. Willem de Vlamingh, in command of the *Geelvinck*, *Nijptangh* and *Weseltje*, was sent in search of yet another missing VOC ship, the *Ridderschap van Holland*.<sup>77</sup>

Dispatched from Texel in the Netherlands in 1696, de Vlamingh reached the Western Australian coast in December that year. While careening the *Geelvinck* at Thompson Bay on Rottnest Island, de Vlamingh sent a party of 86 ashore at Cottesloe, north of the Swan River mouth, to explore inland. The exploration was in accordance with his instructions, which required an investigation of any possible harbour or anchorage that might be of benefit to the VOC's ships. The exploration party was led by the skipper of the *Weseltje*, Gerrit Colaert, and consisted of seamen, soldiers, officials, and two Africans from the Cape to act as interpreters! Landing on January 5, 1697, the party walked inland to the Swan River estuary for two days, sighting lakes and Aboriginal footprints, huts and scarred trees. One group went to the beach, finding an old piece of ship's planking, while the other found the mouth of the Swan River and sailed the pinnace into it and upstream for 3 to 4 miles.

On 10 January de Vlamingh himself led a party in boats about 8-10 miles up the Swan River, to the head of navigation. On several excursions ashore during the two-day journey the huts and other evidence of the Aboriginal occupants were seen, but no people were encountered.

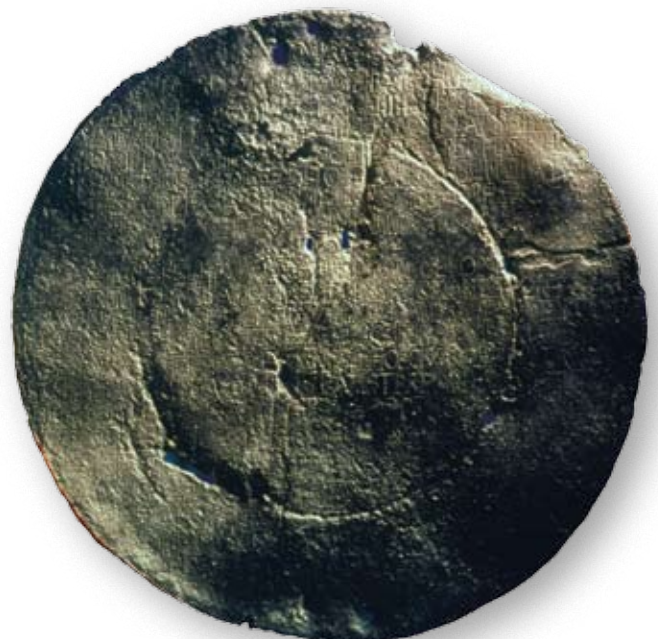
After two weeks at Rottnest Island and the Swan River, both ships headed north, inspecting the coast as they went, charting it relatively accurately past Shark Bay and as far north as North West Cape, and making coastal profile drawings.

De Vlamingh landed at several points as he coasted northwards.<sup>78</sup> The exact position of these landings is often conjectural, based on de Vlamingh's charts and descriptions:

- near Moore River
- at a point north of the Darling Ranges
- Island Point south of Jurien Bay, where several journeys of several hours duration were made inland
- Frenchmans Bay
- Irwin River, near where the first sighting of 10 Aborigines was made (at Whaleboat Cove?)
- Gantheaume Bay, where several inland explorations were made over four days, and the bay sounded and charted
- Dirk Hartog Island, where de Vlamingh named 'Steyle Houck', today's Steep Point, Australia's western point. Dirck Hartog's plate

*The engraved pewter plate left by Willem de Vlamingh at Cape Inscription in 1697 to replace the Hartog plate.*

Western Australian  
Maritime Museum





was found at Cape Inscription and replaced with another plate copying the original and adding de Vlamingh's narrative. Dirck Hartog's plate is now in the Rijksmuseum in Amsterdam, and the de Vlamingh plate is in the Western Australian Maritime Museum in Fremantle

- Useless Loop, Shark Bay
- Little Lagoon, Peron Peninsula, Shark Bay
- Christmas Island.

De Vlamingh's voyage greatly enhanced the knowledge of the geography of the west coast, by closely fixing its position and principle features. These discoveries appeared on a series of charts over the following years (see the map of de Vlamingh's exploration below). The expedition also added to the slowly growing store of scientific knowledge of the continent. His men saw 'a yellow dog [a dingo] jump out of the scrub and throw itself into the sea as if to enjoy a swim', and he described quokkas on Rottnest Island as 'rats as great as cats...all of which had a kind of bag or purse hanging from the throat upon the breast downwards'. De Vlamingh's bewilderment at the weird creature was later echoed by many other explorers confronted by marsupials and monotremes: he was able to describe the quokka 'without being able to understand to what end nature had created the animal like this'. The expedition made clear observation of the black swan, saw emu footprints, and sent baler and nautilus shells to Amsterdam.<sup>79</sup>

### ***The last of the Dutch voyages***

The 1700s saw the end of Dutch interest in Australia, with two exploration voyages and two shipwrecks. The publication of Dampier's voyages (see section below) raised fears of British intentions in northern Australia, and the VOC responded with an expedition to firmly establish their precedence along the northern coast. Maarten Van Delft was dispatched in 1705 with the *Vossenboch*, *Waijer*, and *Nieuw-Holland*, and charted the northern coasts of Bathurst Island, Melville Island, the Coburg Peninsula

*The Zuytdorp Cliffs, on the Edel Land Peninsula south of Shark Bay, where the Dutch ship Zuytdorp was wrecked in 1712.*  
Department of the Environment and Heritage





and eastward towards the Gulf of Carpentaria. Van Delft made some interesting ethnographic observations of Aborigines on the Coburg Peninsula, but had to abort his voyage soon after due to sickness aboard ship.<sup>80</sup>

In 1712 the VOC ship *Zuytdorp*, commanded by Marinus Wysvliet, sailed from Cape of Good Hope on April 1712, and disappeared. No survivors arrived by boat at Batavia, and no search of the Western Australian coast was organised. Wreckage was found at what are now called the Zuytdorp Cliffs, 60 km north of the Murchison River, by stockman Tom Pepper in 1927, and subsequent investigations in the 1950s showed the remains to be those of the *Zuytdorp*. Excavations took place on the extremely exposed seabed site in 1971. Of particular interest in the case of the *Zuytdorp* is that there is evidence that some survivors lived ashore for an undetermined period of time. Campsites have been located inland from the wreck site, and the possibility of absorption into the local Aboriginal community is feasible. It has been argued that several rare genetic conditions noted among the local Aboriginal community may have originated from *Zuytdorp* survivors, but this intriguing idea has not been proven.<sup>81</sup>

Fifteen years later the last VOC ship to meet its fate on the coast was wrecked, like the *Batavia* 100 years earlier, on the Houtman Abrolhos. In 1727 the *Zeewijk* ran onto Half Moon Reef, near Gun Island in the Pelseart group of the archipelago, and was a total loss. Ninety-six of the 112 aboard made it onto the island, and 12 of the crew sailed for Batavia in a boat, but were never heard of again. The survivors built a sloop from salvaged timber, naming her *Sloepie* (Little Sloop), and sailed to Batavia. Two sailors charged with 'committing together abominable sins' were marooned on separate islands, and left behind. The *Sloepie* is the first ship known to have been built in Australia. The survivors' campsite was located in 1840 by John Lort Stokes of HMS *Beagle* (see below), and the wreck site was discovered in 1968, and investigated by archaeologists in the 1970s. Its remains are considered to be of less significance than the earlier VOC wrecks, which come from periods where far less is known about ships and ways of life.<sup>82</sup>

The final Dutch expedition to northern Australia was in 1756, when Jean Etienne Gonzal was sent in the *Rijder* and *Buijs* (under Lavienne Judiowijk van Asschen) to survey the Gulf of Carpentaria and continue westward along the north coast. However, the ships became separated and very little was achieved, though some ethnographic observations were made on the Carpentaria coast.<sup>83</sup> After again failing to successfully survey the north coast, the Dutch finally abandoned interest in Australia.

## THE ENGLISH

### *The Trial*

The English, like the Dutch, gathered knowledge of the west coast from both shipwrecks and intentional visits. The first English ship to reach the Australian shore (and the first known shipwreck) was the *Trial* (also *Tryall*). The ship was on her way from Britain to the East Indies when land was sighted on 1 May 1622, near Point Cloates, south of North West Cape. Her master, John Brooke, confused the mainland for an island, and thought he still had to sail north-east to reach Java, which led him to run aground on what was to be named Trial Rocks in the Monte Bello Group, on the night of 25 May 1622.



The sea was calm and weather fair, and after determining that it was unlikely that the ship would get off the reef, Brooke surreptitiously left the ship in a skip with nine men at 4 am and sailed off northwards. First mate, Thomas Bright, took the longboat and with 36 people stood off the wreck until morning before sailing north to the Monte Bello Islands, but failing to find water, also departed for Batavia. An estimated 97 crewmen were left to their fate—all undoubtedly perishing. Brooke's boat reached Batavia on 25 June and Bright's on the 28 June.

Brooke, to disguise his own fault for the wreck, falsified his journal to show that the wreck site was on the route he had been instructed to take, many miles west of the true position. As a result, the true location of Trial Rocks was not rediscovered until 1934, it then being known as Ritchies Reef. The wreck was discovered in 1969, and archaeological work started there in 1971.<sup>84</sup>

### ***William Dampier***

Following the loss of the *Trial*, the next British contact with Australia was the voyage of Captain John Daniel in the *London* in 1681. Daniel made a sketch plan of the Wallabi Group of the Houtman Abrolhos, the first charting in English of part of Australia, which was published by Alexander Dalrymple 100 years later.<sup>85</sup> However, at the time Daniel's visit seems to have been largely unknown, and did not influence later exploration.

The English ship *Cygnets* (Captain Reed), of which William Dampier was a crew member, sailed from Timor and made landfall on the north west coast of Australia at Pender Bay, south west of Cape Leveque, on 4 January 1688. The ship then ran north-eastward along the coast, and made a landing in King Sound, almost certainly at Karrakatta Bay just south-west of Swan Point, north of the current *Cygnets* Bay. The *Cygnets* was careened there, the party staying for over two months.<sup>86</sup>

Dampier had been engaged in a variety of maritime and commercial activities, including sugar planting, timber getting, and as a merchant seaman and buccaneer for the previous 20 years in the Caribbean, Central America and the Pacific. What made him stand out was that he was also an amateur scientist, an avid observer of all aspects of natural history and native peoples, and he kept journals of his observations. While little of geographical importance resulted from the *Cygnets*' visit, Dampier's observations of the Aboriginal people and natural history received a wide readership when published in his *A new voyage round the world* (1697).<sup>87</sup> He became a celebrity and instant expert on Australia. He mentions various Australian plants and animals, including the footprint of 'a beast as big as a great Mastiff Dog' (a dingo), a 'manatee' (dugong), turtles, and small birds—however, it is his ethnographic observations that stand out for their time.

*Fish Traps at Karrakatta Bay, where Dampier is believed to have landed in 1688.*

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Dampier's were the first detailed descriptions of Aboriginal people, and his characterisation of them influenced Banks and Cook and survived as a popular image that sat comfortably with the beliefs of Australian settler culture for over 200 years. Dampier's assessment of the Aborigines he met at Karrakatta Bay in 1688 was damning:

'The inhabitants of this Country are the miserablest People in the World. The Hodmadods of Monomatapa [Hottentots], though a nasty People, yet for wealth are Gentlemen to these. They have no Houses, or skin Garments, Sheep Poultry, Fruits of the Earth, Ostrich Eggs, etc, as the Hodmadods have. And setting aside their Human shape, they differ little from Brutes... Their Eyelids are always half closed, to keep the Flies out of their Eyes, they being so troublesome here that no fanning will keep them from coming to one's face.'<sup>88</sup>

Dampier goes on to make a detailed physical description matching his generally low opinion of the race. DJ Mulvaney identifies the source of Dampier's disappointment with the coast and its people—he was looking for water and replacements for stores, and found none, as a result seeing the coast as barren and its people as miserable.<sup>89</sup> Dampier's description of Aboriginal material culture and society is the most informative account by any visitor before Cook, mentioning group size, tooth avulsion, swimming between islands, stone fish traps, and spears and clubs, though he failed to realise that the pattern he was seeing was dictated by the wet season and was not the full picture of Aboriginal culture or subsistence.<sup>90</sup>

The influence of Dampier can be seen in Joseph Banks' observation, on seeing people ashore as the *Endeavour* coasted up the New South Wales south coast in 1770, that 'so far did the prejudices which we had built on Dampier's account influence us that we fancied we could see the colour when we could scarce distinguish whether or not they were men.'<sup>91</sup>

After the publication of his first book, Dampier, as the only Englishman to have travelled widely in the Pacific, was widely consulted about the South Seas. He made proposals about another voyage, and was appointed by the Admiralty to command a scientific expedition to the Pacific and New Holland, being given the rank of Captain, and the command of the ship *Roebuck*, which departed England on 24 January 1699.

HMS *Roebuck* sighted land on 10 August, south of Shark Bay, and coasted until it reached the strait between Steep Point, Australia's westernmost point, and Dirk Hartog Island, then carried on around the northern end of that island and into Shark Bay, which he named. The *Roebuck* was anchored off Cape Withnell on 16 August 1699, and Dampier landed on Dirk Hartog Island the following day.<sup>92</sup> After four days without finding water, Dampier sailed north and landed in the Dampier Archipelago (named later by Baudin in honour of Dampier's audacity in sailing into an archipelago so close to an unknown coast), anchoring off Enderby Island and south of East Lewis Island, where he landed, and then north again to anchor and land at Lagrange Bay, south of Broome. From there Dampier headed to Timor to refit his ship, thus ending his Australian exploration.

During Dampier's second visit in 1699 he made further natural history observations (see Dampier's sketches below), but did not substantially add to his earlier findings.

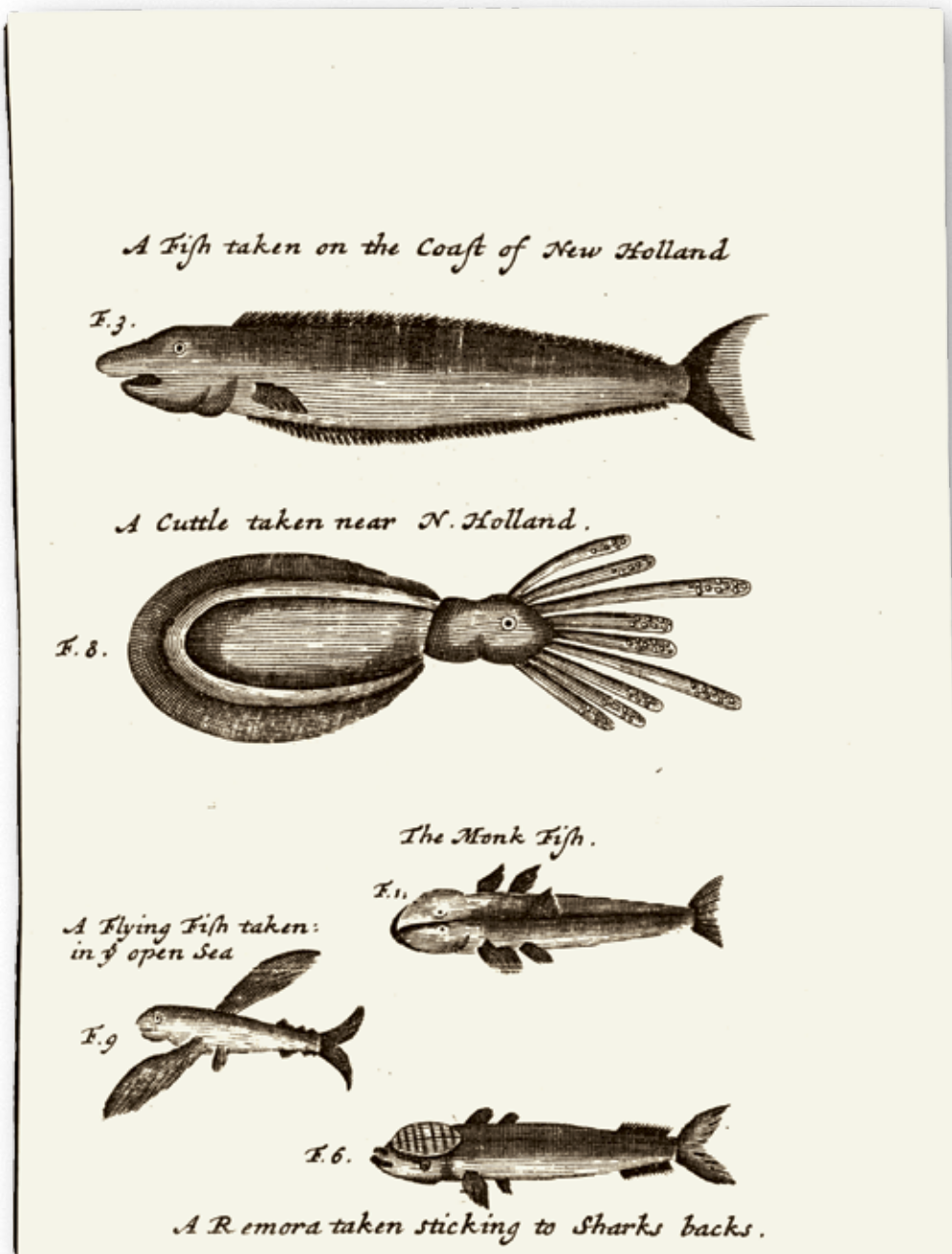


The visit included a depressing example of inter-racial relations that was to be all too common in the years to come. Seeking water at Lagrange Bay, Dampier captured two Aboriginal men with the intention of making them show him where they got it, but this sparked a fight in which one of Dampier's men and an Aboriginal man were wounded. On his return to Britain, Dampier published his experiences in another best selling book, *A voyage to New Holland*.<sup>93</sup>

By the time of his second voyage, Dampier had access to the map of Tasman's voyages down the west coast and via Tasmania to New Zealand. On this basis he was able to see that New Holland was now enclosed within the envelope of Tasman's circumnavigation, though he hypothesised that it might be two islands or even an archipelago, rather than a continent. He therefore distinguished in his plans between 'New Holland' and 'Terra Australis', and his aim, not subsequently carried through, was to search for the latter in the South Pacific beyond New Zealand (which might be

*Fish taken on the coast of New Holland.*

An illustration by William Dampier from his 1729 book, "A voyage to New Holland".





its west coast). New Holland was seen as an obstacle concealing 'some fruitful Lands, Continents or Islands' to the east.<sup>95</sup>

In the context of the present study, Dampier's voyages had an importance out of all proportion to their actual geographical significance. Because the books based on his voyages became best sellers, they were extremely influential in 'mapping' the Australian continent in European eyes, much more so than the Dutch voyages, most of which resulted in reports restricted to Company eyes and charts accessible only to navigators and academics.<sup>95</sup> Dampier's journals also gave rise to literary works that were, in turn, best sellers and classics of English literature. Daniel Defoe's *New voyage round the world* (1725) took its title directly from Dampier's second book, and Jonathan Swift's *Gulliver's travels* (1727) refers to 'my cousin Dampier', and draws on Dampier's experiences in describing Gulliver's stay in Houyhnhnms Land.<sup>96</sup>

After Dampier, the only European visitors to the west coast of Australia before the Frenchman Saint-Allouarn in 1772, were the survivors of the two wrecked VOC ships, *Zuytdorp* (1712) and *Zeewijk* (1727).

## ASIAN CONTACTS—THE MACASSANS

There has long been speculation about early Asian visits to the Australian coast.<sup>97</sup> Much confusion was caused in early maps by the misinterpretation of Marco Polo's journeying, the maps placing his 'Beach' and 'Locach' south of Java, when in fact he was referring to places within the Indonesian archipelago itself.<sup>98</sup>

Scholars studying the maps have sought explanations for these southern named lands. Some have pointed to the Dieppe maps as showing, if not Portuguese knowledge of the South Land, then at least Indonesian knowledge transferred to the Portuguese. This evidence is discussed above. Others have hypothesised that the Chinese admiral Zheng He (Cheng Ho), whose fleets ranged through Indonesia and as far west as East Africa, reached Australia, but there is no documentary or archaeological evidence to support such a suggestion.

Sailing vessels have been blown south-east from the Indonesian islands in the past as they are today, and it is highly probable that some reached Australia. Whether they were able to return is less certain, and no record of those voyages survives, beyond general reports by commentators like Manuel Godinho de Eredia, who wrote around 1600. Stories recorded on Rote, south-west of Timor, about the discovery and use by fishermen of Ashmore Reef, demonstrate the persistence of accidental discovery among coastal peoples.<sup>99</sup>

The trepang (beche-de-mer, sea slug, sea cucumber) trade brought Indonesian fishermen to the northern Australian coastline from at least the mid-18<sup>th</sup> century. The first documented reference to the trade was in 1754, and Macknight places the beginning of the trade as possibly around 1700. The trade ceased in 1906, when the South Australian government stopped issuing licenses to Macassans to operate in the Northern Territory, the main reason being to limit foreign ownership of enterprises exploiting Territory resources.<sup>100</sup>

The trepangers came in praus from the eastern Indonesian archipelago, and especially from Macassar (now Ujung Pandang) in southern Sulawesi, sailing south with the



north-west monsoon in about 10 days to the land they called 'Marege'. They moved eastward along the coast, and then returned home with the south-east trade winds after late May. The praus ranged from the Kimberley, east to the Gulf of Carpentaria, landing wherever shallow protected waters would support the trepang. The trepang, used in Chinese cookery, was processed by boiling, burying it in sand to decalcify it and drying and smoking it in bamboo sheds. The sites of this industry, and associated campsites, are spread across the region, often marked by introduced tamarind trees. While relations with Aboriginal communities were often poor, some Aborigines are known to have worked as crew on the praus, and some went back to Sulawesi at the end of the season.

European navigators of the north coast came into occasional contact with the Macassans. There appears to be no evidence of the Dutch voyagers of the 17<sup>th</sup> and early 18<sup>th</sup> century sighting praus on the coast, supporting the suggestion that the trade began about the mid-18<sup>th</sup> century. Matthew Flinders, while charting the Gulf of Carpentaria in the *Investigator*, was puzzled by finding what we now know to be Macassan trepanging sites on Vanderlin and North Islands in the Sir Edward Pellew Group, and he came across six praus among the islands off Arnhem Land's Cape Wilberforce on 17 February 1803, at a place he named Malay Road. The commander of the squadron, Pobassoo, told Flinders that 60 praus with 1 000 men were working on the Arnhem Land coast that year.<sup>101</sup> In the same year Nicholas Baudin came across several praus on the Kimberley coast.

P. P. King in the *Mermaid* encountered 15 praus at Sims Island on the Arnhem Land coast, and another 15 praus and many smaller canoes in Malay Bay and Mountnorris Bay in March 1818. King was very cautious of the Macassan vessels, fearing piracy, but had a meeting with Macassan trepangers at Popham Bay on the Coburg Peninsula in late April<sup>102</sup>.

In 1829 Captain Collet Barker, commandant of the settlement at Raffles Bay on the Coburg Peninsula, reported 34 praus in the bay and a total of 60 or 70 on the coast that year, with about 1 500 men engaged in the industry.<sup>103</sup>

There has been much archaeological work on the Macassan sites, which has identified sites that are potentially important in relation to the present study. Macknight surveyed sites in Arnhem Land and excavated a number of them. Typical features included lines of stone hearths for the boiling cauldrons (often visible on the surface), decalcifying trenches, smoke-house fireplaces and floors, and many fragments of glass bottles and pottery containers. Macknight excavated a large site at Anuru Bay in 1966-68, which included a row of at least 21 fireplaces for cauldrons, a double grave, smokehouse depressions, decalcifying pits, and domestic remains. The site was reported by Baker in 1983 to be in good condition.<sup>104</sup>

Another very clear example of a trepanging site is on Karruwa Island (Little Vanderlin Island) in the Sir Edward Pellew Group, in the Gulf of Carpentaria. It has a fireplace line, reported in 1984 to be in an excellent state of preservation, and two wells, but souvenir collectors had removed a lot of the ceramics from the site.<sup>105</sup>



## MAPPING THE COAST—OVERVIEW 1606–1756

The interests of the Spanish, Portuguese and Dutch in the South-East Asian and Australian region were based firmly in their commercial exploitation. National interest equated very closely with establishing commercial opportunity and protecting it. The only reason for expeditions of exploration was to determine the resources of new lands and to beat rivals in securing them if they promised to be valuable. The degree to which information reached beyond the company or state department responsible for the voyage depended to a large degree on the openness of the country involved, and the degree of separation between state and commercial interests at the time. Hence Torres' discovery of a passage south of New Guinea languished in official files, while the Dutch discoveries soon made their way onto publicly available maps, even if the journals themselves stayed within the control of the Dutch East India Company.

The marriage of commercial and national interest is seen throughout the period. The primary objective of most of the Dutch expeditions to the Gulf of Carpentaria was to determine if the rumoured passage, hinted at by Jansz, actually existed. Such a route would provide a very convenient route into the Pacific to exploit its resources and harass the Spanish interests there, without having to venture through the strongest Spanish sphere of influence around the Philippines. The voyages were a notable failure in that objective. Tasman's instructions directed him to seek a similar route round the southern side of the South Land, which he did.

Dampier, whose first visit to New Holland was 'to see what that Country would afford us', persuaded the British Admiralty to send him on his second voyage with promises of gold. Marten van Delft's expedition appears to have been a direct response to the perceived threat to Dutch pre-eminence in New Holland posed by Dampier's expeditions. De Vlamingh's detailed surveys of the Swan River and other sites on the Western Australian coast were to determine if good harbours existed for the relief of VOC ships, and if the hinterland promised commercial opportunity—on the whole they did neither.

The various accidental sightings, landings and shipwrecks did little to directly advance knowledge of New Holland (though some of the search expeditions did). They emphasised the Dutch presence and helped to establish the Netherlands as the undoubted master of the north, west and much of the south coast over a period of 150 years. All the little bits of geographic information were rapidly transferred to Dutch charts and maps, making the evolving knowledge of the shape of the emerging continent available to all interested nations.

The Dutch slowly began to include descriptions of what they saw that was of wider than just commercial interest, and Dampier in particular foreshadowed a new level of understanding of the continent, with his amateur scientist's interest in natural history and native peoples. At the same time, Dampier was the first to popularise his image of New Holland and its people, an image that held sway for nearly 100 years, until the experience of the east coast and the influence of the science of the enlightenment moderated the harsh picture he painted.

The Macassan trepang industry also brought the South Land into a wider sphere of knowledge, albeit limited to the fishing and commercial centres of Indonesia and



China. There were no journals or charts produced that have survived, but the extent and nature of the industry is demonstrated by the surviving trepanger sites spread across the north coast from the Kimberley in the west to the Sir Edward Pellew Group (and possibly as far as the Wellesley Islands) in the Gulf of Carpentaria. It is also represented in the journals of explorers from Flinders' time onwards, and in the records of the early European settlers of the north coast.

The period of Dutch dominance established European presence in Australia well before Cook. People were born and died here, and some may have been absorbed into the Aboriginal communities. In the process, Terra Australis, the land of the unknown, became New Holland, still little known but at least largely defined and fixed on the map. The search for the fabled 'Terra Australia Incognita' was transferred to the south and east of Tasman's coast of Staaten Land (New Zealand), and awaited Cook to finally dispatch it from the geographer's concept of the world.

Places that stand out as potentially significant in this period are:

- Wenlock River, Jansz's 1606 and Carstensz's 1623 landing place, with its Aboriginal associations
- Cape Keerweer, Jansz's turn-around point and Carstensz association
- Cape Inscription, Dirk Hartog Island, Hartog's 1616 landing place, with many later associations (as the seaward side of Shark Bay) including Dampier, de Vlamingh, Saint-Allouarn, Baudin, and Freycinet
- Nuyts Archipelago, Thijssen's eastern-most advance along the south coast in 1627
- Houtman Abrolhos Islands (several), the site of the wrecks of the *Batavia* and *Zeewijk* and the land sites associated with those events
- North Bay, Tasmania, Tasman's landing place
- Cape Leschenault, site of the wreck of the *Vergulde Draeck*, and the subsequent events
- Rottneest Island, explored by the *Waeckende Boey* (1658), and de Vlamingh (1697), a key location on the coast
- Swan River, the first place extensively explored inland by de Vlamingh in 1697
- Zuytdorp Cliffs, site of the wrecking of the *Zuytdorp*
- Trial Rocks, the site of the wrecking of the *Trial*, first Australian recorded shipwreck
- Karakatta Bay, King Sound, Dampier's 1688 landing site, first observations of Aborigines, etc.
- Malay Road, (Pobassoo's Island) Arnhem Land, site of first meeting between European explorers and Macassans, 1803
- Anuru Bay and Karruwa Island, as significant Macassan trepang sites.







# 4

## WHERE IS THE EAST COAST? THE BRITISH AND THE FRENCH

The long hiatus between the last voyage of Dampier (1699) and that of Cook (1770) had seen major changes in both the nature and motives of exploration voyages, and in the role played by science. This section looks firstly at the frenzy for science that had arisen in the 18<sup>th</sup> century, and its relationship to exploration voyages, and then at the exploration expeditions themselves.

### THE FRENZY FOR SCIENCE

In the popular mind, Joseph Banks virtually ‘invented’ the natural history of Australia during Cook’s voyage. However, Banks was the product of a long history of development of science during the Age of Enlightenment, and earlier explorers had done valuable work in bringing information about the plants and animals of New Holland to the wider world.

#### *The Dutch and Dampier*

The early Dutch navigators referred to animals seen, but did little collecting or scientific description. Jansz in 1606, for example, made the first reference to an Australian species in sighting the Torres Strait pigeon on the Cape York west coast; Claesoon in 1618 mentions a number of birds; and Carstensz in 1623 makes two references to seeing what appear to be dingo footprints, also on the west coast of Cape York.<sup>106</sup>

The first recorded sighting of a macropod was of the Tammar wallaby (*Macropus eugenii*) by François Pelsaert on the Houtman Abrolhos Islands, following the wreck of the *Batavia* in 1629. While James Cook is often credited with the first descriptions of kangaroos, this is inaccurate, his claim to fame here being that his party at Endeavour River in 1770 killed several species of macropod, and acquired the name ‘Kangooroo’ or ‘Kanguru’ from the local Aborigines, which has stuck. Black swans



(*Cygnus atratus*) were apparently first seen by Antonie Caen off Bernier Island in 1636, and confirmed by de Vlamingh at the Swan River in 1696: '[we] saw many swans (of which our boat shot some nine or ten)'. Tasman seems to have seen Cape Barren geese in Tasmania at Blackman Bay (now North Bay), and blue fin tuna off the South Australian coast in 1642, and was the first to refer to crocodiles in Australian waters in the naming of the Crocodile Islands of the Northern Territory in 1644.<sup>107</sup>

De Vlamingh saw the footprints of the emu at Jurien Bay on the west coast in 1696, it being likened to that of the cassowary, which was already known from New Guinea. However, a live specimen of emu was not met with by Europeans until one was killed in Sydney in 1788. De Vlamingh's men saw a dingo (*Canis lupus dingo*), and he shot and inspected quokkas (*Setonix brachyurus*) on Rottnest Island, and named the island after them. Quokkas had already been noted on the island as a 'wild cat resembling a civet-cat', by Volckerts on the *Waeckende Boey* in 1656.<sup>108</sup>

De Vlamingh also described what appear to be the Rottnest Island cypress pine (*Callitris preissii*) and tea tree (*Melealeuca lanceolata*), and seems to have suffered mild poisoning from eating *Macrozamia viedlei* seeds. He forwarded specimens of timber and sea shells to the VOC officials in Batavia and Europe, and possibly collected the two specimens of plants (*Acacia truncata* and *Synaphea spinulosa*) described by the Dutch botanist Burmann in 1768, the first Australian plants described within the Linnaean system.<sup>109</sup>

William Dampier made more extensive descriptions than his predecessors during his two visits to the Western Australian coast in 1688 and 1699. He was at heart a natural historian, seeing the world through querying eyes, and as such he was unusual in his age. The great historian of Cook's voyages, John Beaglehole, wrote of Dampier that 'with the equipment of the seventeenth century, he had the attitude of the eighteenth.' Not much of a buccaneer, his chosen career, not much of a leader, a man with little ambition but with a sceptic's determination to find hard evidence in place of folklore and superstition, 'his taste was not for marvels, but for the examination and adequate description of natural phenomena.'<sup>110</sup>



The Dampier memorial at Broome in Western Australia. Dampier was one of the great natural historians of his time, and specimens of Australian plants collected by him as he sailed up the Western Australian coast are still preserved at Oxford University in the UK. Department of the Environment and Heritage



Dampier knew the names of many plants and animals, describing them in (pre-Linnaean) scientific terms, and contrasting his discoveries with those seen elsewhere. His journal was the first broad account of the Australian environment, with geographical descriptions of the land, soils and tides, and his surviving collection of specimens (at Fielding-Druce Herbarium, Oxford University), the earliest authenticated surviving collection of Australian plants, includes 23 species of Australian plants. His journal describes a further six plants as well as 17 birds, 14 fishes, three marine mammals (including the dugong, *Dugong dugon*), two or three terrestrial mammals, as well as reptiles, molluscs, and one example each of insect, cephalopod and phytoplankton.<sup>111</sup> Dampier's observations were made at Karrakatta Bay in, King Sound, Dirk Hartog Island (Shark Bay), the Dampier Archipelago, and Lagrange Bay, south of Broome, with his botanical specimens being collected on Dirk Hartog Island and East Lewis Island in the Dampier Archipelago. While the specimens used by later botanists to classify Australian species using the 'modern' Linnaean system were primarily taken from collections made after Dampier's time, Robert Brown used Dampier's material when he first described *Dampiera incana* in 1810, making Dampier's the type specimen.<sup>112</sup>

Dampier's influential observations of Aboriginal culture and society are discussed in the previous chapter.

### ***Natural science and exploration in the late 18<sup>th</sup> century***

'Organised science', in the sense of systematised scientific enquiry backed by learned societies and governments, arose as a phenomenon in western Europe after the mid-17<sup>th</sup> century. In Britain, the Royal Society for the Promotion of Natural Knowledge (usually shortened to 'the Royal Society'), founded in 1660, was the final flowering of the vision of the polymath Francis Bacon (1561-1626), and was based on the models of the Oxford experimental philosophers of a decade earlier, and the French *académies privées*. The Royal Society was a scientific club, funded by its members' subscriptions, as a forum to discuss scientific ideas, to promote research and to publish reports. It became a catalyst for the development of a union between science and government. Early successes resulted from the work of members such as Samuel Pepys, and included the establishment of the Royal Observatory (1675) to advance astronomy, especially for navigation, and the Royal Mathematical School (1673), to provide scientifically trained recruits for the Royal Navy. France was even more successful; its Académie [Royale] des Sciences, established by Colbert under Louis XIV in 1666, being largely funded by the state. The Académie, after being suppressed in 1793, was reconstituted as part of the Institut National in 1795.<sup>113</sup> The Royal Society was periodically directly involved in government-sponsored projects, such as the establishment of the Board of Longitude, set up in 1714 to improve methods of determining longitude at sea, and the Society became increasingly an advisor to government on matters relating to science.

The British government's interest in science and exploration increased during the late 18<sup>th</sup> century for a number of reasons. Its colonial aspirations in Canada, America and India were boosted with the defeat of the French in the Seven Years War (1756-63), which ousted France from North America and India and gave Britain new possessions in the West Indies. Britain was in the position of leading world power, and desired to maintain and reinforce that position. Its investment in exploration



and science was in part to enhance its prestige, in part to expand its commercial opportunities by finding both new resources and new markets for its booming industrial sector, and in part to maintain strategic control over its expanding empire. The fruits of these objectives were clear after Cook's first expedition, and their pursuit was made increasingly important after the loss of the American colonies in the War of American Independence (1775-1783). The administration of British Government became more centralised following the war, in recognition of some of the failures found in the existing system, and the role of science in the effective consolidation and exploitation of the empire was reinforced by Banks, as the President of the Royal Society from 1778.<sup>114</sup>

The nature of science itself evolved substantially during the 18<sup>th</sup> century. The Swedish naturalist Carl Linnaeus worked from the 1730s developing and refining a new system for classifying plants according to their reproductive parts into class, order, genus and species, using a binomial naming system. Linnaeus's system of classification revolutionised the study of natural history when published in his *Species plantarum* in 1753, and provided the underpinning for the burgeoning of science in the coming age of maritime and terrestrial exploration.<sup>115</sup>

In the light of a forthcoming Transit of Venus, the Royal Society started to lobby government in the mid-1760s. Observation of the transit of the planet Venus across the face of the sun from a number of widely spread observatories was recognised as a method of measuring the distance of the earth from the sun and Venus, information of major scientific importance and relevant to the development of navigation. The urgency of the project was that the Transit, which had been first observed as a phenomenon in 1639, and was the subject of serious study in 1761 (when observations by Neville Maskelyne on St Helena had not been successful), would occur in the year 1769, but then not again until 1874, 1882, 2004 and 2012. The Society recommended observations at Fort Churchill in Hudson Bay and North Cape in Norway, and convinced the Admiralty to provide a ship to make observations in Tahiti. It was given supervision of the scientific arrangements and a £4 000 grant to support that work, though its nominee for command, Alexander Dalrymple, was declined by the Admiralty, on the basis that only naval officers should command naval vessels, and there should be no confusion of split authority between naval and civilian voyagers.<sup>116</sup> The Society appointed Charles Green as astronomer, and Joseph Banks as naturalist.

The French expeditions of the late 18<sup>th</sup> century and early 19<sup>th</sup> century also devoted considerable time and resources to science. French scientists were active participants in the post-Linnaeus boom in the description and classification of the natural world, including the description of the natural history of Australia. For example, the genus *Eucalyptus* was established in 1788 by L'Héritier, based on *Eucalyptus obliqua*, the messmate stringybark cultivated at Kew Gardens from seed apparently brought back from Adventure Bay by Tobias Furneaux on Cook's second voyage.<sup>117</sup> The Académie des Sciences, and subsequently the Institut National, promoted science as part of the exploration expeditions at the end of the century. Lapérouse's expedition did not have a substantial scientific component, though his priest, Claude-François-Joseph Receveur, also acted as his naturalist. Receveur died at Botany Bay in 1788, and is buried in the Sydney suburb of La Perouse.

D'Entrecasteaux's expedition (1792-93), by contrast, had a substantial scientific staff of two hydrographers, four naturalists, a mineralogist, two artists, a gardener-botanist,



and two astronomers.<sup>118</sup> The French were among the first to study the fluctuation in strength of the earth's magnetic field, including important observations at Recherche Bay in Tasmania in 1792. The contribution of this team is detailed below. Baudin (1801-02) repeated this pattern, and the contribution of that expedition is also described below.

Unlike earlier voyagers, who dwelt on the strangeness of the natural world and its inhabitants, and made generally negative subjective assessments of them (unless they were commercially valuable), the scientists and officers who were products of the intellectual climate of the Age of Reason described and evaluated what they saw in more objective terms. Despite the occasional lapse into the adoration of the 'noble savage', the inhabitants of new lands were seen as people, not as lesser beings—strange perhaps, but human, and to be studied and understood rather than dismissed in disgust.<sup>119</sup>

## CAPTAIN JAMES COOK

By 1768 the Pacific had been crossed many times, but mainly in a thin belt north and south of the equator, and through the North Pacific. Those crossing major sections of the South Pacific before Cook were:

- Magellan (1519-1521)
- Mendaña (1567-1568)
- Quiros and Torres (1605-1606)
- Schouten and Le Maire (1615-1617)
- Roggeveen (1721-1724)
- Anson (1740-1743)
- Byron (1764-1766)
- Wallis (1766-1768)
- Carteret (1766-1769)
- Bougainville (1767-1768)

Cook's immediate British predecessors were Wallis and Carteret. Samuel Wallis (HMS *Dolphin*) supported by Phillip Carteret (HMS *Swallow*) was sent out in 1766 at the behest of the First Lord of the Admiralty, the Earl of Egmont, to extend the discoveries of Byron's voyage (which did not succeed in most of its aims) and to establish a more prominent British presence in the South Seas. The two ships got separated at the Straits of Magellan, and completed their voyages independently. Wallis crossed the central Pacific, becoming the first European to sight Tahiti, spending a month there. Carteret crossed the Pacific further south than anyone to that time, discovering Pitcairn Island, and made the first European sighting of the New Hebrides since Mendaña 200 years earlier.<sup>120</sup> Neither Wallis nor Carteret was accompanied by any trained natural historians, and made no scientific advances beyond geographic discovery.

These earlier voyages all followed routes north of 30°S latitude (and most north of the Tropic of Capricorn), and none went further west from the South American coast than about 100°W longitude. On the western side of the ocean, Tasman's route north from New Zealand to Tonga marked the furthest eastern penetration into the South Pacific. This left a huge unexplored section of the Southern Ocean and South Pacific



in which Terra Australis could still exist. Cook was to extinguish this lacuna of hope and ignorance in his first and second voyages.



*Portrait of Captain James Cook  
RN 1782 by John Webber RA*  
oil on canvas, 114 x 91 cm  
Collection: National Portrait Gallery  
Purchased by the Australian  
Government with the generous  
assistance of Robert Oatley  
and John Schaeffer, 2000.

Lieutenant James Cook (promoted from master for the role) was selected by the Admiralty to command the voyage of the *Endeavour*, the primary objective of which was the observation of the transit of Venus in Tahiti. In the words of the Admiralty instructions: 'When this Service is perform'd you are to put to Sea without Loss of Time, and carry into execution the Additional Instructions contained in the inclosed (sic) Sealed Packet.' Cook's secondary sealed orders instructed him that:

'...Whereas there is reason to imagine that a Continent or Land of great extent, may be found to the Southward of the Tract lately made by Capt<sup>n</sup> Wallis in His Majesty's Ship the *Dolphin*...[on leaving Tahiti] You are to proceed to the southward in order to make discovery of the Continent abovementioned until you are in the Latitude of 40°, unless you sooner fall in with it. But not having discover'd it or any



evident signs of it in that Run, you are to proceed in search of it to the Westward between the latitude before mentioned and the Latitude of 35° until you discover it, or fall in with the Eastern side of the land discover'd by Tasman and now called New Zealand.'<sup>121</sup>

If a new continent was indeed discovered, Cook was to provide their Lords of the Admiralty with details of 'the nature of the soil and its products, beasts, birds, fishes, and minerals', samples of 'seeds of the trees, fruits and grains, and an account of the native inhabitants, if any, and friendship, alliance and trade with them'. Cook was 'with the Consent of the Natives to take possession of Convenient Situations in the Country in the Name of the King of Great Britain; or, if you find the Country uninhabited take Possession for His Majesty by setting up Proper Marks and Inscriptions, as first discoverers and possessors.'<sup>122</sup>

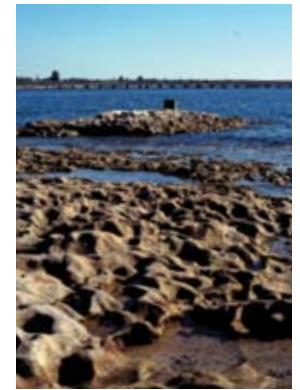
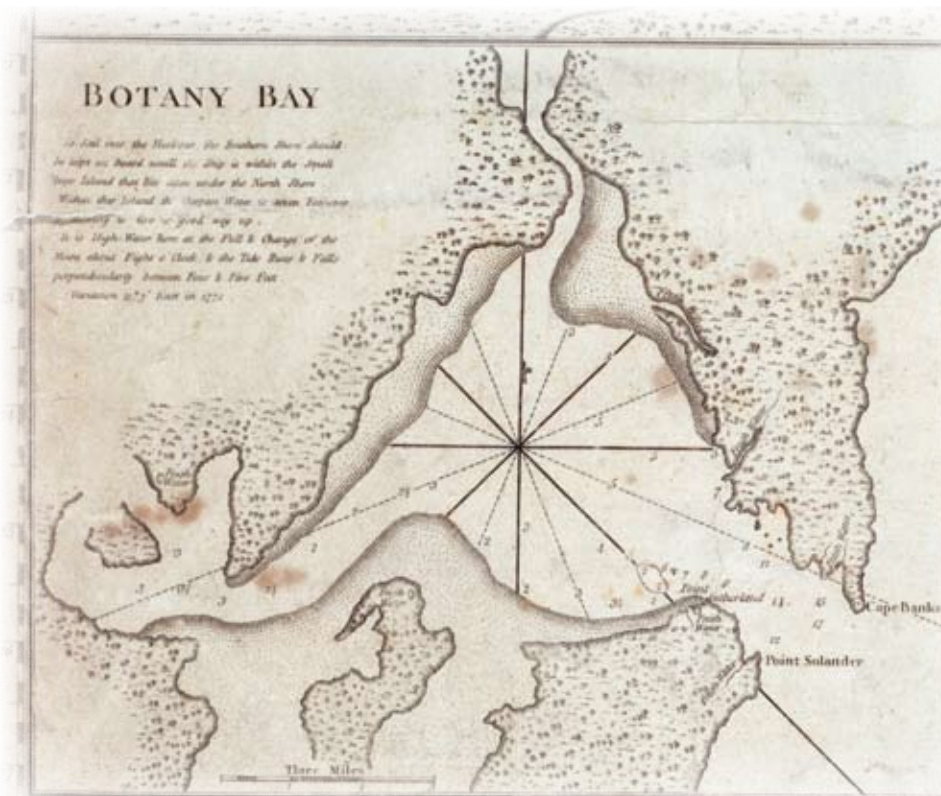
To achieve the more scientific parts of his instructions beyond his skills as a navigator, the Royal Society provided the astronomer Green and the scientific party under Banks. Just fifteen years after publication of Linnaeus's new classification system, Joseph Banks, gentleman naturalist, engaged as his companion the Swedish naturalist Dr Daniel Solander, one of Linnaeus's students and disciples, and equipped his party for the first major expedition of world exploration to apply the Linnaean system to its work. Herman Spöring was engaged as assistant naturalist, Sydney Parkinson as natural history illustrator, and Alexander Buchan (who died in Tahiti) as landscape artist. The pattern of their collaboration saw Banks and Solander jointly collecting specimens, which Solander then described and classified, with Spöring managing the records. Parkinson sketched the plants and made notes for future completion of fuller illustrations, and finally Banks supervised their pressing and drying. Solander wrote up the fuller descriptions on their return to Britain. Both Parkinson and Spöring were to die during the voyage of fever contracted in Java.<sup>123</sup>

Following the observations in Tahiti, Cook followed his instructions, and on 7 October 1769 reached the east coast of New Zealand. He proceeded over the following six months (to 31 March 1770) to circumnavigate and chart both islands before considering how to return to Britain. In discussion with his officers, Cook discounted returning via Cape Horn due to the rigours of such a route in winter, though he would have liked to take that route in order to cross the Pacific at a high latitude and 'prove the Existance or Non-Existance (sic) of a Southern Continent'. He discounted returning directly via the Cape of Good Hope 'as no discovery of any Moment could be hoped for in that rout (sic).'

'It was therefore resolved to return by way of the E. Indies by the following rout: upon Leaving this Coast [i.e. New Zealand] to steer to the Westward until we fall in with the E. Coast of New Holland, and then to follow the direction it might take us, until we arrive at its Northern extremity; and if this should be found impracticable, then to Endeavour to fall in with the Land or Islands discovered by Quiros [i.e. Espiritu Santo].'<sup>124</sup>

The first land sighted on the east coast of Australia was named by Cook, Point Hicks, after the Lieutenant who first saw it, on the morning of the 20 April 1770 (19 April ship's time). Point Hicks cannot be identified with certainty on today's maps, but is thought to





above: This stone plinth marks the spot at Kurnell on Botany Bay, where Cook and his men first stepped ashore on Australian soil.

Department of the Environment and Heritage

left: James Cook's 1770 sketch map of Botany Bay. The small anchor off Sutherland Point marks Cook's mooring position. From an edition printed in London by Robert Sayer in 1787. National Library of Australia

be in the vicinity of Cape Everard, Victoria, where a monument to the first sighting has been erected. The trend of the land caused Cook to consider Tasman's plotting of Van Diemen's Land, and Cook was 'doubtfull whether they are one land or no'. However, he headed north according to his plan rather than solve that geographic puzzle.

Cook carried out what is called a running survey as he sailed up the coast. The method applied was standard for the day, following that set out by John Robertson's navigation manual.<sup>125</sup> It consisted of taking bearings with the azimuth compass of the prominent coastal features in sight from the ship which was anchored or hove-to, to provide a steady observation point. The next set of observations was taken from a new position several miles along the coast, taking bearing back to the last landmarks, and adding new ones now in view. A sketch of the coast was made at each observation position, and the points to which bearings had been taken were noted by letter on the sketch. The progress of the ship between observation positions was measured by log, and the resulting triangulation of the bearings taken transferred to the chart, building up a running survey of the coastline. The method required that at least the last point surveyed before dark be in view the following morning, so the survey would not be broken. To achieve this the ship usually hove-to or sailed very slowly so that the last surveyed landmarks were still visible at daybreak. Cook's running survey along the east coast was carried out at a rate averaging 30 miles a day.<sup>126</sup>

As the *Endeavour* coasted up what is now the New South Wales south coast, Cook used prominent land features as markers on which to take bearings to construct his running survey. Two prominent points so used south of Botany Bay were Mount Dromedary and Pigeon House. Batemans Bay was sighted and named: 'This Bay seem'd to be but very little Shelter'd from the Sea Winds, and yet it is the only likely Anchoring place I have yet seen upon the coast.' On the coast near Pigeon House Cook saw a small island (Brush Island) that he hoped to be able to shelter the ship behind, but on approaching saw that it was not safe, and even an attempt to land a





Captain Cook's tablet at Cape Solander in Botany Bay, erected on the spot where he first cast anchor in New Holland, from a lithograph prepared from a sketch made by Dr Lhotsky in 1839.

National Library of Australia

boat was thwarted by an on-shore wind springing up. Six days later, on 28 April, Cook attempted a landing by boat at what is now Tom Thumb Lagoon near Wollongong. Cook, Joseph Banks, Daniel Solander and the Tahitian Tupia (as interpreter) were in the boat, and Cook hoped to make contact with a small group of Aborigines seen on the shore with their bark canoes, but heavy surf prevented the landing.

The next morning Cook spotted a bay (Botany Bay), and sent the Master (Molyneux) in the pinnace to sound the entrance, before taking the *Endeavour* in. Cook anchored under the southern shore of the bay about 2 miles within the entrance in 5 fathoms of water, on the afternoon of 29 April (see Cook's chart above). Botany Bay, originally named Stingrays Harbour by Cook, was the first of the 15 locations on which Cook or his men landed while in Australia and Torres Strait (see Table 2).

Aborigines were seen on both points of the bay as the ship entered, and a 'village' of six or eight huts was located opposite where the ship moored. Cook went ashore with Banks, Solander and Tupia and a combined party of 30 or 40 men, in the hopes of talking with some of the inhabitants. The Aborigines dispersed, but two men remained to oppose the landing with spears and woomeras, and 'waving us to be gone'. Cook threw them some nails and beads, which they took up, but when the boat continued its intent to land, they opposed it again, Cook firing a shot between them. The Aborigines then took up spears and one threw a large stone at the boat, upon which Cook fired small shot at them (twice according to Banks), hitting one man in the legs and causing him to take up a shield as protection. Cook's party then landed, and the Aborigines threw two spears at them, Cook's men firing again (again, twice



according to Banks), causing the Aborigines to withdraw. In the bush nearby Cook found a few small huts made of bark, in one of which were four or five small children. He left some beads, ribbons and cloth in the hut, and removed 40 or 50 spears lying outside. Three bark canoes were drawn up on the shore.<sup>127</sup>

The Aborigines remained shy, and even though many encounters occurred in the following weeks, most observations of the life of the Aborigines were made from a distance, or observation of empty huts and abandoned artefacts.

Banks and Solander made a very large collection of plant specimens (83 species):

‘Our collection of Plants was now grown so immensely large that it was necessary that some extraordinary care should be taken of them least they should spoil in the books. I therefore devoted this day to that business and carried all the drying paper, near 200 Quires of which the larger part was full, ashore and spreading them upon a sail in the sun kept them in this manner exposd (sic) the whole day, often turning them and sometimes turning the Quires in which were plants inside out. By this means they came on board at night in very good condition.’ (May 3 1770).<sup>128</sup>

Unfortunately, some of Banks’ collection was ruined when the *Endeavour* took water on the Endeavour Reef later in the voyage.

Among their Botany Bay finds were several new genera and an overwhelming number of new species. These included banksias (*Banksia integrifolia*, *Banksia serrata*), drumsticks (*Isopogon anemonifolius*) and the bottlebrush (*Callistemon citrinus*), Eucalyptus species, acacias, grevillias, the flame tree (*Brachychiton acerifolia*), and waratah (*Telopea speciosissima*).<sup>129</sup> Sydney Parkinson was hard at work drawing the specimens.

Sailing north from Botany Bay, Cook marked another series of prominent coastal features useful for coastal navigation, the main ones being:

- Three Brothers Mountains, near Taree
- Sandy Cape
- Cape Byron, the most easterly point on the coast
- Point Danger (the latter probably really Fingal Point, with ‘a small island’ (Cook Island) and Danger Reefs offshore from it)
- Glasshouse Mountains
- Double Island Point
- Cape Capricorn
- Whitsunday Passage
- Cape Gloucester
- Cape Upstart
- Lookout Point
- Cape Direction
- Cape York



North of Sandy Cape and its extension, Breaksea Spit, at the northern end of Fraser Island, Cook was into the shoal and reef waters that mark the inner passage of the Great Barrier Reef. For the next thousand miles there would be a man positioned in the chains (the shelves projecting from the sides of the ship to support the shrouds holding up the masts) taking soundings by leadline, and boats were sent out ahead taking soundings to locate hazards.

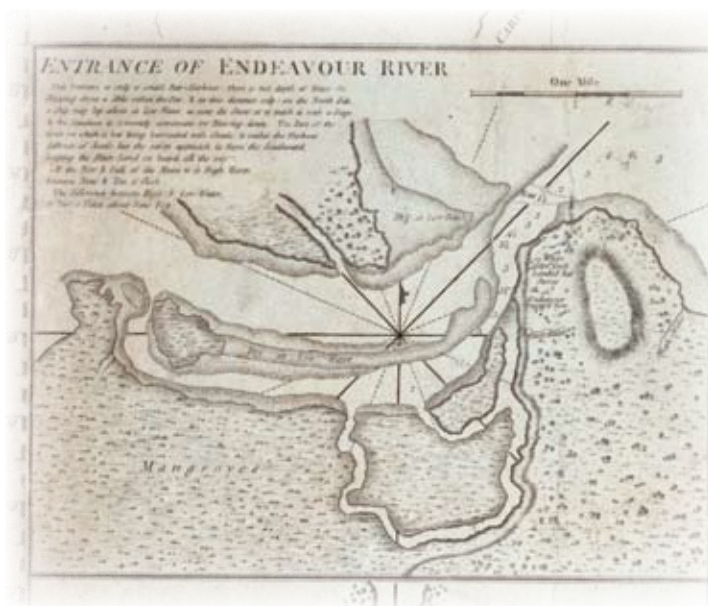
As he worked to the north, Cook landed at Bustard Bay, Thirsty Sound and Mission Bay looking for water, and the Palm Islands looking for coconuts, and Banks and Solander took the opportunities offered to botanise (see Table 2).

The expedition nearly ended on Endeavour Reef, off Cooktown, on 11 June. The *Endeavour* struck a reef that arose from depths of 17 fathoms within a cable length (182 m). Cook lightened ship and was able to heave her off next day, then fother the hole with a sail woven with wool and oakum, before sailing towards the coast in search of a location to beach the vessel for repairs.

Relief was found at Endeavour River, the future site of Cooktown. McIntyre has suggested that Cook had a copy of one of the Dieppe maps aboard, and that he used this to find Endeavour River.<sup>130</sup> This is extremely unlikely for three reasons. Firstly, there is no evidence to suggest that Cook had such a map, or that Banks owned one at the time of the voyage (though he later did own the 'Harleian Map'). Secondly, the degree of detail in the Dieppe maps is such that to rely on such a small-scale map to find a small coastal river amidst a sea full of reefs in a stricken ship would be suicidal. Finally, Cook's journal explains with perfect clarity the standard process of sending out boats to seek a suitable place along the coast to beach the *Endeavour*—he didn't go directly there; he sought the best picture he could of the coast downwind and took a risk with a river reported by his boats.

Endeavour River was called 'Charco Harbour' by the crew, probably based on the interpretation of the Aboriginal word 'yir-ke' which was an expression of surprise.<sup>131</sup> The ship was hauled close to the shore and unloaded, then moved to a sandy beach where it was able to be careened, exposing the damaged bottom for repair (see Cook's chart below).

Cook's chart of the Endeavour River, Cooktown, in 1770. From an edition printed in London by Robert Sayer in 1787. National Library of Australia





While at Endeavour River awaiting the repair of the *Endeavour*, Banks and Solander collected many new species, including *Araucaria cunninghamii*, red cedar (*Toona australis*), tulip wood, *Hibiscus tiliaceus* and kangaroo grass (*Themeda australis*). The kangaroo was identified and given a name used by the Aborigines ('Kangooroo' or 'Kanguru' according to Cook<sup>132</sup>, though not the first macropod discovered, the Tammar wallaby being described by François Pelsaert in WA in 1629<sup>133</sup>), and a possum was collected.



*Lizard Island in the Great Barrier Reef. From the highest point of the island, at far right, Cook was able to see a passage through the maze of reefs and shoals that make up the Great Barrier Reef.*  
Department of the Environment and Heritage

Leaving Endeavour River, Cook headed into more reef-infested waters. Forty nautical miles to the north he took the opportunity of being able to moor off a headland, and to land and climb the highest point to look for a clear route through the many islands in sight. He named the headland Lookout Point. Islands lay to the north and east, with the outer reef beyond the latter. Cook sent the Master to sound the passage between the islands to the north (the Turtle Group), while he went in the pinnace with Banks to the islands to the east. He reached Lizard Island, and from its highest point was able to see a passage through the reef to the east. The party spent the night on the island, and next morning Cook sent the pinnace to investigate the passage, while he and Banks remained to investigate the island. Returning to the ship, Cook and the Master, Molyneux, conferred, and on balance Cook decided it best, given the navigation hazards increasing along the coast, to get outside the reef and head north in open water. A course was therefore laid to the newly-located passage, and with the boats going ahead the *Endeavour* sailed out to the outer reef and got safely through the passage (Cook's Passage).

Cook expressed his understandable relief at being free of the shoal waters inside the Barrier Reef, and instead in the open ocean swell.

'[It]...made me quite easy at being freed from fears of shoals etc—having been among them more or less ever since the 26<sup>th</sup> of May [it now being the 14<sup>th</sup> of August], in which time we have sailed 360 leagues without ever having a man out of the chains heaving the lead when the Ship was under way, a circumstance that I dare say never happened to any ship before and yet here was absolutely necessary.'<sup>134</sup>



Yet the relief was short-lived. Cook was determined to find a passage between Australia and New Guinea, if one existed, and to do this he had to keep in touch with the reef and the coast. Belief in the passage was based on Dalrymple's writing and rumours of Portuguese and Spanish vessels passing south of New Guinea, and Cook had on board a chart in Dalrymple's book showing a dotted line of Torres' route through Torres Strait (not then named), though Dalrymple was not to publish his transcript of the more detailed Torres material until after Cook's death. The desire to prove or disprove the passage put Cook in a difficult position, with the reef to his lee and the ship's strained hull beginning again to leak in the heavy swell, and the men having to be kept constantly at work at the pumps. As he sailed to the west to regain contact with the coast, the wind fell calm, and the *Endeavour* was carried by the swell and the currents towards the reef. At 4 am on the morning of the 17 August (16<sup>th</sup> ship's time) breakers were seen ahead, and the ship was just one mile from the reef in dead calm. Cook put out the boats to pull her head around to the north, with the aid of sweep oars put out of the stern ports.

By 6 am the ship had drifted to about 80-100 yards from the breakers on the reef. Cook picked up two slight breezes and was able to work the ship a bit to the north, when a passage was seen ahead. However, while the boats reported that the ebb tide was rushing out of it and they could not enter with no wind, the same tide carried the ship a quarter of a mile out from the breakers, and Cook skilfully worked this advantage to widen the gap to 1.5 or 2 miles. As they drifted back again towards the reef, Hicks was sent to investigate another opening.

The passage (Providential Passage) was navigable, and Cook worked the ship down to it, and this time the flood tide and a light breeze carried them through. As they anchored inside Cook wrote with bemusement:

'It is but a few days ago that I rejoiced at having got without the Reef, but that joy was nothing when Compared to what I now felt at being safe at anchor within it, happy once more to encounter those shoals which two days ago out utmost wishes were crowned by getting clear of, such are the vicissitudes attending this kind of service and must always attend unknown Navigation where one steers wholly in the dark without any manner of Guide whatever.'<sup>135</sup>

Even in this position science continued and Banks and Solander accompanied the boat sent to the Providence reef to collect clams for food. While there they also collected two sea snakes as well as coral and fish species.

Cook worked his way again through shoal but protected waters for the next four days, when he found the strait he believed might exist, around Cape York into what was later named Torres Strait. As the heading changed to the south-west, Cook was certain the east coast was rounded, and he, Banks and Solander landed on what he named Possession Island, and there hoisted the flag, proclaimed the land discovered for King George, and fired a salute, returned from the ship. Cook acknowledged that he was now in waters found by Dutch navigators, and considered his discoveries finished. He and Banks landed briefly once more, on Booby Island in the middle of Torres Strait, before sailing on for the East Indies.



**TABLE 2 COOK'S LANDING PLACES ON THE EAST COAST AND TORRES STRAIT**

	LANDING PLACE	DETAIL	DATE, 1770 (CALENDAR TIME)
1	Botany Bay (Kurnell)	Botanical discoveries by Banks and Solander, contact with Aborigines.	29 April - 7 May
2	Bustard Bay (Seventeen Seventy)	Cook and Banks landed, Cook surveyed creek and lagoon. Evidence of Aborigines seen.	24 May
3	Thirsty Sound	Cook surveyed inlet as possible careening site, but no water found, Banks and Solander ashore but little of interest except termites and mud-skipper. Evidence of Aborigines seen.	30 May- 1 June
4	Fantome Island (Palm Islands)	Banks and Solander ashore for coconuts, instead found cabbage palms; Banks collected 14-15 specimens.	8 June
5	Mission Bay, Cape Grafton	Cook, Banks and Solander ashore, but no water and nothing of note.	10 June
6	Endeavour River (Cooktown)	Repairing <i>Endeavour</i> , much botanical and zoological discovery, Kangaroo, Possum. Contact with Aborigines.	17 June - 5 August
7	Turtle Reef (off Endeavour River)	Crew and Banks landed on reef islets to collect turtles (now Boulder Reef).	19 June - 5 August
8	Lookout Point	Two minor landings to climb headland and view reef entrances.	11-12 August
9	Turtle Group	Molyneux surveying passage through islands, with landings.	12 August
10	Lizard Island	Cook and Banks by boat to climb hill to view passage through reef. Evidence of Aborigines visiting the island: huts, midden. Sent pinnacle out to reef to view passage.	12-13 August
11	Eagle Island	Cook and Banks landed en route from Lizard Island, lots of sea birds and eagles. Evidence of Aborigines seen.	13 August
12	Providential Channel reef	Boats sent to reef after re-entering the Barrier Reef, to collect shell-fish (giant clams).	18 August
13	Sandy Isle	Banks landed on a 'small sandy isle' 4-5 leagues off-shore, and shot noddy terns.	19 August
14	Possession Island	Cook, Banks and Solander landed on island west of Cape York, claimed possession of east coast. Aborigines seen on shore.	22 August
15	Booby Island	Cook and Banks landed, shot boobies.	24 August

Science had been a central part of the exploration, with the scientists being involved in all of the landings along the coast, and Banks collected 331 Australian plants as well as many new animal species.<sup>136</sup> Some of the iconic species of Australian plants—eucalypts, acacias, waratahs— and animals— possum, dingo (and the kangaroo named)—were made known to science, and the nature of the Australian environment made far better known than it had previously been, countering to some extent the vision given by the reports of the barren desert coasts of Western Australia and the monsoonal scrub of the north.

Cook's astronomer, Charles Green, made the lunar distance observations of longitude that formed the base for the running survey of the coast, measuring the angular distance between the sun and moon for the Australian coast calculations. Longitude was also calculated at Endeavour River by observation of the occultation of one of the



moons of Jupiter. Latitude was calculated by the much simpler method of measuring the meridian altitude of the sun. An analysis of the accuracy of Cook's positions, based on Green's observations, compared with the modern charts has shown the latitude error from Point Hicks to Endeavour River to have been on average just 2.5 minutes (i.e. 2.5 nautical miles), and the error in longitude to have averaged about 10 minutes—a very accurate result given the methods used. North of Endeavour River the accuracy of longitudes fell away progressively and considerably, with that at Booby Island being 77 minutes too far to the west. One explanation for this might have been that Green was now a sick man, dying at sea in the following January, and others less skilled than he may have had to take over his observations.<sup>137</sup>

Cook's survey of the east coast completed the main outline of the Australian continent. His chart of the coast was updated by Flinders' chart published in 1814, which in the Barrier Reef region included many of Cook's soundings taken from his log but not published on his original charts. Cook's survey was finally superseded by the publication of Phillip Parker King's more detailed charts in 1824.<sup>138</sup>

## THE ENGLISH AFTER COOK

The English explorations of Australia after Cook, and before detailed coastal survey commenced at the start of the 19<sup>th</sup> century, was largely limited to Tasmania and the Cape York/Torres Strait area. In all cases the navigators were on their way somewhere else, so that their additions to knowledge of the coast were minor. Tasmania was first surveyed by Tasman in 1642 (see 'The Dutch discoveries' above), and the next explorer there was Marion Dufresne in 1772 (see 'The French' below).

During Cook's second voyage he was given two ships, and his second-in-command, Tobias Furneaux, reached Van Diemen's Land (Tasmania) in HMS *Adventure* on his way to a rendezvous with Cook in New Zealand in 1773. Furneaux anchored on 9 March 1773 at Adventure Bay, which he named after his ship, to water. On leaving Adventure Bay, Furneaux charted parts of the east coast of Tasmania not seen by Tasman, as far north as the Bass Strait island group that now bears his name, but adverse winds prevented him linking up the survey of Van Diemen's Land with that

*View of Adventure Bay, Van Diemen's Land, New Holland. Drawing in ink and watercolour, 1777, by William Ellis. National Library of Australia*





of Cook starting at Point Hicks, so the insularity of Tasmania remained an unknown (see Furneaux's chart below).<sup>139</sup>

Cook himself visited Adventure Bay on 26 January 1777 in HMS *Resolution* to water and gather wood and fodder. William Bligh, the ship's master, made a survey which was published in the journal of the expedition, but did not expand knowledge of the area.

Bligh again visited Adventure Bay in August 1788 in HMS *Bounty* enroute to Tahiti, but surveyed no new coast. Bligh's return from Tahiti in the ship's boat, following the mutiny, took him through the Barrier Reef, entering the reef just south of Cook's Providential Passage on 29 May 1789. Bligh followed the coast north to Torres Strait, which he passed through via Prince of Wales Passage, the first European to pass through what is today the major shipping passage through Torres Strait.<sup>140</sup>

The arrival of the First Fleet and the establishment of the Port Jackson settlement and its outriders, led to discoveries of great importance to the subsequent development of Australia. The first discovery of importance was Governor Arthur Phillip's location of Port Jackson itself, just north of Cook's Botany Bay. Cook had seen the entrance and named it Port Jackson, but had not investigated it. Phillip was immediately convinced that Botany Bay could not support his settlement, and so sent a boat northward to investigate Broken Bay, also seen and named by Cook. On its way north the boat entered Port Jackson and found one of the finest harbours in the world.

Within three weeks of establishing his settlement in Port Jackson on 26 January 1788, Governor Phillip dispatched HMS *Supply* to found a secondary settlement on Norfolk Island, Lieutenant Philip Gidley King landing his party of twenty-two there on 6 March 1788. Norfolk Island had been discovered by James Cook in HMS *Resolution* in 1774, and Cook had stressed the tall, straight pine trees and the flax of the island. Phillip's instructions directed him, in order to secure these reported naval materials, 'as soon as

*Remains of the settlement on Norfolk Island, where the first settlement was established by Philip Gidley King in March of 1788.*

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above: *The Furneaux chart of Van Diemen's Land, March 1773. From an edition published in 1777 by William Strahan, London.*  
National Library of Australia



above right: *A view of Lord Howe Island, looking towards Mounts Gower and Lidgbird, names taken from two of the officers of the HMS Supply who first sighted the island in February 1788.*  
Department of the Environment and Heritage

circumstances admit it, to send a small establishment thither to secure the same to us and prevent it being occupied by subjects of any other European Power'. It is likely that the Admiralty had Lapérouse in mind.<sup>141</sup> The settlement of Port Jackson and Norfolk Island, as the first British toe-holds in the Pacific, changed, in a strategic sense, the shape of the map of Australia in a global context.

A spin-off of the voyage to settle Norfolk Island was the discovery of Lord Howe Island, first sighted by Lieut. Henry Lidgbird Ball in HMS *Supply* on 17 February 1788. Ball landed on the island as he returned from Norfolk Island, and claimed British possession. While visited many times in subsequent years, Lord Howe Island was not settled until 1834.<sup>142</sup>

The southern part of Tasmania was visited by the unlikely leader of a nominally Swedish expedition, John Henry Cox, in July 1789. English merchant Cox had gained the support of the Swedish King Gustav III to raid Russian fur trade posts on the American north-west coast, allowing Cox to fly the Swedish flag when he needed to in attacking the interests of Sweden's then enemy Russia. Cox watered at what is now Cox Bight on Tasmania's south coast, where he found Aboriginal huts. He then headed for Adventure Bay, but overshot it and ended up near Maria Island, passing through what is now Mercury Passage between that island and the mainland, and mooring in Oyster Bay (now Shoal Bay on Maria Island). There he found more evidence of Aboriginal huts, and though the people were shy at first, a group of 14 to 15 men and women eventually accepted Cox's gifts, and he made some observations of them.<sup>143</sup>

Perhaps one of the strangest coastal voyages of this period was that of William and Mary Bryant, convicts transported to New South Wales, who escaped with their two children and eight other convicts in a boat in March 1791. William Bryant, a skilled fisherman and boatman, sailed the fishing boat, a six-oared ketch, north from Sydney along the New South Wales and Queensland coasts, rounding Cape York after 69 days, and arriving in Koepang, Timor on 5 June 1791 after 10 weeks at sea. The Bryants became the first Europeans to complete the whole of the Great Barrier Reef Inner Passage, as well as the first to enter the Hunter River, Port Stephens, Moreton Bay and anchorages along the Barrier Reef.<sup>144</sup> Unfortunately, the Bryants kept no journal and made no charts, so the detail of their voyage added nothing to the knowledge of the Australian coast.



Edward Edwards in HMS *Pandora* was sent by the Admiralty to collect and return for trial mutineers from Bligh's *Bounty*. Returning with some of the *Bounty* mutineers from Tahiti, *Pandora* charted a northerly stretch of the Barrier Reef east of Torres Strait, and named the Murray Islands, while searching for a passage through the reef. On 28 August 1791 the *Pandora* struck a reef at what is now Pandora Entrance and quickly became a total wreck, with the loss of 31 crew and four mutineers. The survivors sailed east to Cape York and on to Timor in the boats.<sup>145</sup>

George Vancouver, Able Seaman on Cook's second voyage and then midshipman on his third, led a hydrographic expedition to the north-west coast of America in 1791-95 in the ships *Discovery* and *Chatham*. Vancouver sailed east from Cape of Good Hope via the south-west coast of Australia, with the intention of providing an up-to-date position for the coast, it having not been visited since Nuyts in 1627. He reached the coast near Point Nuyts on 23 September 1791, and landed at and named



King George Third Sound, later shortened to King George Sound. Vancouver, the first British navigator to touch this coast, took formal possession of it for Britain on 29 September, at what is now named Possession Point opposite Albany, though this claim was never recognised by the British Government. The expedition spent a fortnight at King George Sound, making observations of the topography, Aboriginal hut sites (though he had no meetings with Aboriginal people themselves), and natural history. Vancouver then sailed offshore, naming Termination Island in the Recherche Archipelago as he passed.<sup>146</sup> Vancouver made no more contact with the Australian coast, much more of which was surveyed by d'Entrecasteaux in the following year. However, Vancouver's King George Sound was to be a major locality in the history of Australia.

*The cairn at Possession Point on King George Sound in Western Australia, where Vancouver landed in 1791 and took formal possession of the land in the name of the British Crown.*

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The final British exploration of this period was that of Lieutenant John McCluer, an East India Company officer engaged in the survey of the west coast of New Guinea in 1791-92. Completing his survey, McCluer coasted along the northern Australian coast, sighting and naming New Year Island off the northern tip of Arnhem Land.<sup>147</sup>



## THE FRENCH

After the conclusion of the Seven Years War in 1763, both France and Britain knew that the Treaty of Paris was just a respite, a temporary truce. The war ended both France's colonial developments in Canada and India, and, for the time being, her dominance within European politics. Britain, on the other hand, was not only consolidating her existing overseas possessions, but seemed set on establishing a global colonial empire, controlling sea routes, and dominating world trade.

In the same period the burgeoning of French philosophy and science threw up ideas that urged the resolution of the Terra Australis question. The chronicler of Pacific voyages, Charles de Brosses, elaborated in his *Histoire des navigations aux terres Australes*, published in 1756, on what was known and what might yet be found in the southern seas of the Pacific and Indian Oceans, and urged the further exploration of these possibilities for the greater glory of France. With the glory might also come commerce, wealth, and sea power to rival Great Britain.<sup>148</sup>

De Brosses proposed following up the sighting of the southern continent reported by the 16<sup>th</sup> century French voyager Gonneville, and seemingly confirmed by Bouvet de Lozier's 1739 sighting of his Cap de Circoncision, which is now the sub-Antarctic Island of Bouvetøya. The Falkland Islands might be settled as the strategic hub of the routes to the new lands, and the settlement of Australasia (both the known and the yet to be known parts) should be considered above all else. New Britain seemed an ideal spot, praised by both Dampier and Roggeveen. De Brosses' ideas were taken over wholesale by Scotsman John Callander in the late 1760s, but his work did not resonate as had de Brosses' in war-torn and humbled France.<sup>149</sup>

The influence of de Brosses can be seen in France's responses following the peace of 1763. To try to prepare for the next war, and to start the re-establishment of France's colonial strength by establishing bases to make up for those it had lost, France would begin occupying unsettled territory, especially on the southern sea routes, to slow down Britain's expansion.<sup>150</sup> Such settlements would greatly enhance the value of the presumed southern lands waiting to be discovered.

The first concrete step in this strategy, proposed and sponsored by Louis de Bougainville, was the annexation of the Falkland Islands and their occupation by Arcadian settlers expelled from French Canada by the British. The islands were named the 'Malouines' by Bougainville, after the early French navigators of St Malo, and this name is the source of the Spanish 'Malvinas', still used by Argentina to refer to the Falklands. The Malouines would provide France with a strategically located base close to South Atlantic sea routes, paralleling its base at Isle de France (Mauritius) in the Indian Ocean. Bougainville's settlement was a privately funded affair, but with tacit official backing, and he delivered the first settlers to the Malouines in 1764.<sup>151</sup>

On a second trip to the Malouines in 1765, Bougainville sighted the ships of the British Pacific expedition under Byron, while collecting wood at the Straits of Magellan. He did not learn until he returned to France that Byron had just been to the Falklands to take formal possession of them for Britain, France's colonising strategy having become known. Britain claimed priority through earlier discovery, but Spain claiming the Falklands to be part of South America, was also disturbed by its ally France's colonial aspirations in this quarter. Under diplomatic pressure,



France gave in to Spanish demands, sending Bougainville once more to the islands on his way to the Pacific in 1768, to hand them over to Spain (see below). The persistent rival claims to the Falklands by the British and the former Spanish South American colonies were, as recently as 1982, the cause of the Falklands War.<sup>152</sup>

Bougainville's search for new possessions for France shifted focus to the Pacific, where the British had been accelerating their own naval exploration activities. Anson's cross-Pacific voyage twenty years before (1740-43) had not been emulated, but in the 1760s things hotbed up. Byron (1764-66), Wallis and Carteret (1766-68), and Cook (1768-71) were sent in quick order to the Pacific. Bougainville argued persuasively that France should also be there, with himself in charge of the first official French voyage to the Pacific. The scientific community on both sides of the Channel was lobbying for such expeditions, and this provided a safe pretext taken advantage of by both nations.<sup>153</sup>

### ***Bougainville nearly makes Australia French***

Louis-Antoine de Bougainville, but for the Great Barrier Reef, might have claimed the east coast of Australia for France. In 1768 Bougainville, with the ships *Boudeuse* and *Étoile*, after formally handing over the Falkland Islands from France to Spain, sailed across the Pacific from the Strait of Magellan, via Tahiti to the New Hebrides (Mendaña's 'Espirito Santo'), in search of new land. From there Bougainville sailed westward, straight towards the unknown east coast of New Holland. On 4 June 1768, Diane Reef was seen and named, and the following day wood and fruit were seen in the water, causing Bougainville to conclude: 'I have no doubt that there is land SSE of us'. On the 6<sup>th</sup> breakers were seen ahead, and after tentatively trying to steer around them further breakers were seen, and Bougainville turned away to the north-east and headed towards New Guinea. He went to lengths in his journal to explain this action when he knew land was ahead, arguing that with water for only about a month, and food supplies for three, he was in no position to commence what might be a lengthy exploration of a difficult shore.<sup>154</sup>

Bougainville's breakers are now named Bougainville Reef, an isolated Coral Sea reef 140 km east of the nearest point on the Great Barrier Reef. While some of Bougainville's people claimed to have seen land to the south-west of the breakers, this is very unlikely to have been Australia, as Bougainville Reef is 200 km from the nearest part of the coast near Cooktown.

### ***Marion Dufresne***

An officer of the French Compagnie des Indes, Marc-Joseph Marion Dufresne was assigned the task of returning home to Tahiti from Isle de France (Mauritius) the Tahitian Aotourou, who had accompanied Bougainville to France in 1768. Marion himself paid for the crew's wages, while France provided the ships and stores, Marion to repay them for one ship and stores on his return. This mix of commercial and state interest was common to the early French Pacific voyages. Marion's motives are obscure, but the desire to explore for potential new Spice Islands seems the most likely. To this end it has been suggested that part of this search involved following up the sighting of the southern continent by Gonneville, and seemingly confirmed by Bouvet de Lozier's 1739 sighting of his Cap de Circoncision.<sup>155</sup> Duyker believes he



then intended to swing north through the Pacific towards Tahiti, crossing an uncharted region, before heading again westward to seek land in the area of the New Hebrides and New Holland.<sup>156</sup> News of Cook's voyage up the east coast of Australia had not reached Mauritius before Marion sailed, so his frame of geographical reference was the same as Cook had when he left Britain in 1768, apart from his knowledge of Bougainville's penetration of the Coral Sea west of the New Hebrides.

In the *Mascarin* and *Marquis de Castries*, the Marion expedition left Mauritius in October 1771, calling at Cape of Good Hope, then discovering Marion Island ('Terre d'Espérance', re-named after Marion by Cook), Prince Edward Islands, and the Crozet Islands, named after Marion's second in command Julien Crozet, before proceeding to Van Diemen's Land.<sup>157</sup>

The first Europeans to have visited Tasmania since Tasman 130 years before, Marion's ships met with the coast at about High Rocky Point in the south-west, then coasted around to Maria Island on the east coast. The coastal survey was not a detailed one, but rather picked out prominent points, though the charts they produced were better than Tasman's. Charts by Crozet and de Clesmeur provided some additional detail of the Forestier and Tasman Peninsulas, and good charts of Tasman's Frederick Henry Bay (now North Bay), south of Maria Island, where the ships anchored. Marion's major contribution to knowledge of Australia was his first European contact with Tasmanian Aborigines. Seeing Aborigines on shore in North Bay, Marion, de Clesmeur, Jean Roux and eight seamen approached in a boat, and Marion sent two seamen, naked, ashore, where they were well received.

Marion and the rest of the party then landed, and he was presented with a firebrand, taken to be a ritual presentation. Marion presented a hen and a duck. However, when more men tried to land the Aborigines became defensive, and stoned the party, Marion and several others being hit, and the seamen responded with musket shots into the air. The party withdrew and took to the boats, but on again attempting to land were showered with stones and spears, one of the men being speared in the leg, and Marion ordered a stronger response by musket, in which at least one Tasmanian was killed. Lieutenant Le Dez made a number of observations of these brief encounters that are of anthropological interest.<sup>158</sup>

Marion's party spent six days in the bay, and may have sighted a thylacine (a 'tiger' or 'tiger cat', and a dog-like quadruped), but there was no professional naturalist aboard, so all natural history descriptions are very general and no discoveries of value to science were made.<sup>159</sup> Marion made the first landing on Maria Island, and more observations of Aboriginal material culture were made. Unable to sail north due to adverse winds, and being unable to find a good supply of water, Marion then headed towards New Zealand.

Marion's quest for the southern continent (or any profitable new land) was cut short in New Zealand, when he and 18 of his crew were killed by Maoris in June 1772 after having inadvertently cut down a sacred tree. Crozet took command and returned the survivors to Isle de France.

### ***Saint-Allouarn***

Louis François Alléno de Saint-Allouarn commanded the ship *Gros Ventre* in Kerguelen-Tremarec's first voyage to the Southern Ocean in 1772. The expedition



departed Isle de France a month before DuFresne's expedition left. Saint-Allouarn became separated from Kerguelen off Kerguelen Island, and after waiting, sailed in accordance with his orders to Cape Leeuwin, where he landed at Flinders Bay on 17 March 1772, before coasting northwards out of sight of land to Shark Bay. A party under Ensign Mingault was landed at Baie de Prise Possession (Bay of Turtles, near Cape Inscription) on Dirk Hartog Island on 30 March, and took possession of the land for the French king by hoisting the flag and burying a proclamation and two French coins in a bottle. A gunner's mate, Massicot, died of scurvy and was buried on Dorre or Bernier Island. The ship then coasted northwards to the vicinity of Melville Island before heading for Timor and Java.<sup>160</sup>

Saint-Allouarn's claim of possession was not recognised formally by France, and was not generally known of until the early 20<sup>th</sup> century when uncovered by Australian historian Ernest Scott.<sup>161</sup> It had no influence on later events, and made no contribution to the knowledge of Australia.

The site of Saint-Allouarn's proclamation, at Turtle Bay, was excavated by archaeologists from the Western Australian Maritime Museum in 1998. Eighteenth-century material was found, including a French coin dated 1766 and a French wine bottle with lead capsule. These are assumed to be associated with the Saint-Allouarn expedition.<sup>162</sup>

### ***Lapérouse***

Jean- François de Galaup de Lapérouse had already completed a long and successful circuit of the North Pacific when he reached Botany Bay via Norfolk Island on 24 January 1788. The First Fleet under Arthur Phillip, which had arrived four days earlier, was just about to move on to Port Jackson, and Lapérouse had Botany Bay to himself for the six weeks he was there. His base was on the northern side of the entrance, near a water source identified by Cook, at a site now known as Lapérouse Landing Site. Lapérouse, though a great navigator, did nothing to increase knowledge of the Australian continent, but his was the first French expedition to use the improved navigation methods that had come at the end of the 18<sup>th</sup> century. His work was very accurate, and he served as a role model for those who followed, such as d'Entrecasteaux who was looking for any signs of the expedition that had vanished after leaving Botany Bay.<sup>163</sup>

While Lapérouse may not have added much to the knowledge of the continent, his presence stimulated Britain to expand its foothold in the region, and deny it to the French, by sending a party to occupy Norfolk Island, which was settled just days before Lapérouse left Botany Bay, never to be seen again.

### ***D'Entrecasteaux***

Joseph-Antoine Bruni d'Entrecasteaux was dispatched in 1791 to lead a surveying expedition to the Pacific, and to search for the missing Lapérouse expedition. The expedition had a substantial scientific staff: two hydrographers (Beautemps-Beaupré and Miroir-Jouvençy), four naturalists (Labillardière, Deschamps, Riche and Ventenat), a mineralogist (Blavier), two artists (Piron and Chailly-Ely), a gardener-botanist (Delahaye), and two astronomers (Bertrand and Pierson). These 'savants' were not subject to naval discipline. Blavier, Chailly-Ely and Bertrand left the expedition at Cape of Good Hope, so Riche took over the mineralogist's role, and



an officer, Rossel, became astronomer.<sup>164</sup> The expedition's instructions directed the gardener to plant European plants and instruct the indigenous people encountered how to propagate them, as well as to gather potentially useful native plants, to be cultivated and reproduced at Ile-de-France for later transfer to the Caribbean colonies. The naturalists were to work closely with the artists to ensure that accurate and useful representations of all plants and animals were made. The astronomers were to provide the results of their 'geographical observations' to the hydrographers, and the latter were to make their plans of the coast available to the astronomers.<sup>165</sup> They were also to take geophysical measurements of the magnetic field.

The *Recherche* and *Espérance* sailed via the Cape of Good Hope direct to Van Diemen's Land, where, due to a mistaken navigation bearing, d'Entrecasteaux made anchor in a protected bay previously unknown to Europeans, that he named Recherche, on 23 April 1792. But for the navigation error, d'Entrecasteaux would have anchored at Furneaux's Adventure Bay. D'Entrecasteaux was quite taken by Recherche Bay:

'I shall attempt the vain task of conveying the feelings I experienced at the sight of this solitary harbour, placed at the ends of the earth, and enclosed so perfectly that one could think of it as separated from the rest of the universe. Everything reflects the rustic estate of raw nature. Here one meets at every step, combined with the beauties of nature left to itself, signs of its decay, trees of enormous height and corresponding width, without branches along the trunk, but crowned with foliage always green: some appear as old as the world; so interlaced and compacted as to be impenetrable, they support other trees equally large but dropping with age and fertilizing the ground with debris reduced to rottenness. Nature in all its vigour, and at the same time wasting away, seems to offer the imagination something more embellished by industry and by civilized man; wanting to conserve only the beauty, he has destroyed the charm; he has removed its unique character, that of being always ancient and always new.'<sup>166</sup>

Anchoring in Port du Nord (now Pigsties Bay), the expedition spent three weeks repairing the boats, taking astronomical and magnetic observations, watering and wooding, and collecting natural history specimens (see a copy by Peree of one of Piron's sketches below). Parties were sent out to investigate the surrounding area, and the southern shores of what is now d'Entrecasteaux Channel were explored and charted.

A garden was set up above the shore of what is now Coal Pit Bight by Felix Delahaye (aka, LaHaie, Lahaie)—d'Entrecasteaux wrote:

'Various seeds sowed by M. La Haye, gardener-botanist, might in future furnish supplies to navigators who will shelter in this haven, if however their produce escapes the destructive zeal of the natives who might mistake the new plants, the properties of which they are ignorant of, for all the other herbs which they seem to allow to perish with their fires.'<sup>167</sup>





Contrary to the impression given in this and other statements about the garden, d'Entrecasteaux's instructions placed greatest emphasis on the garden being for the benefit of the indigenous people, the benefits for mariners being secondary. The gardener must '...sow European seeds that offer a chance to prosper in the lands that you will land, and to indicate as best he can to the natives of the country, the ways to cultivate and reproduce them'.<sup>168</sup> Delahaye seems to have been under no pressure to achieve the latter part of this instruction in Tasmania.

*A black swan at Recherche Bay in Tasmania, drawn in 1769 by Jacques Louis Peree, a member of the French expedition led by Rear Admiral Bruni d'Entrecasteaux which camped in the area in 1792 and 1793, and planted a garden there.*

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The plants placed in the garden, which was a plot 9 m x 7 m, included onions, cress, chervil, celery, potatoes, cabbages, radishes, chicory and sorrel. Labillardière described the garden:

'I accompanied the gardener to the ground where he had sown different European seeds. This spot, which was very well dug for an extent of nine metres by seven, had been divided into four patches; it afforded a soil in which clay was too predominant to ensure the success of the seeds that had just been committed to it.'<sup>169</sup>

He was proved right in his assessment of the garden. On their return to the site in 1793, Labillardière and Delahaye found that little had grown. They met some Aborigines in the area and:

'...we took them to the garden we had created the previous year at Port du Nord. M. La Haye inspected it with more care than on the first occasion; he found that a few chicory plants, cabbages, sorrel, radishes, cress and a few potatoes had grown, but had only produced the first



two seminal leaves. While he examined with extreme attention all the parts of this garden, one of the natives showed him the plants which had lifted up; he was making a perfect distinction between them and the indigenous plants, although they were nearly imperceptible. M. La Haye ascribed, with good reason, the lack of success of his vegetable garden to the seeds having been sown in too advanced a season.<sup>170</sup>

Labillardière added; "...these plants would no doubt have thriven better nearer to a rivulet that we perceived to the westward. I had at least expected to find the cresses planted on its banks; surely this could have proceeded only from the forgetfulness of the gardener."<sup>171</sup>

below: d'Entrecasteaux's chart of Recherche Bay, showing where the French garden was situated centre right, where the two French vessels anchored, and where their observatory was set up in 1792.

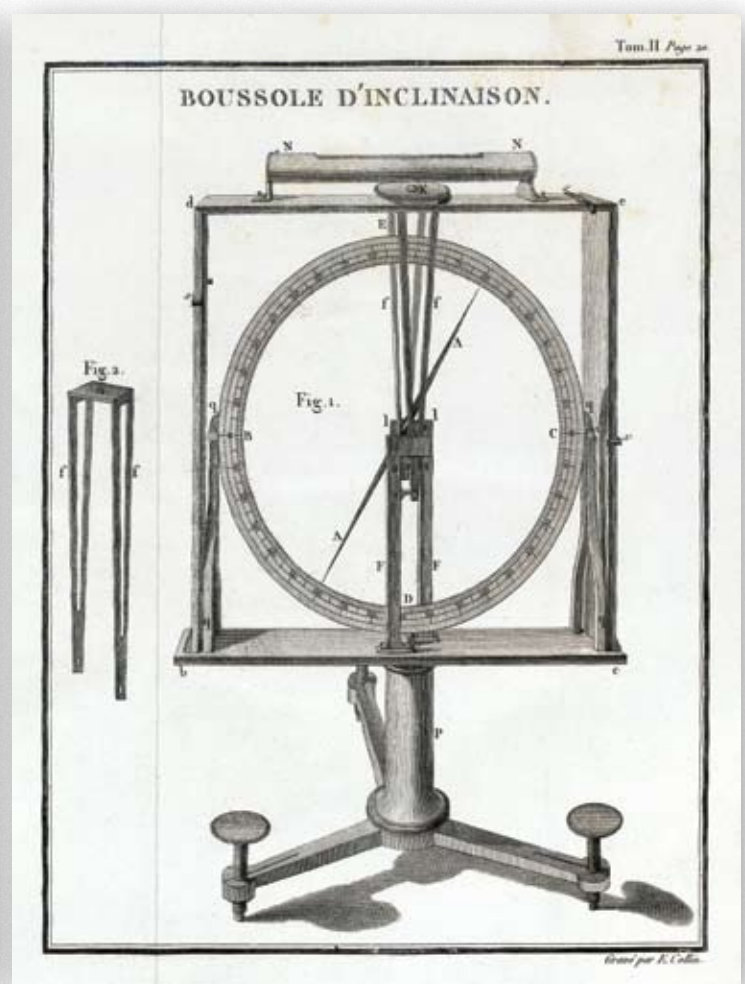
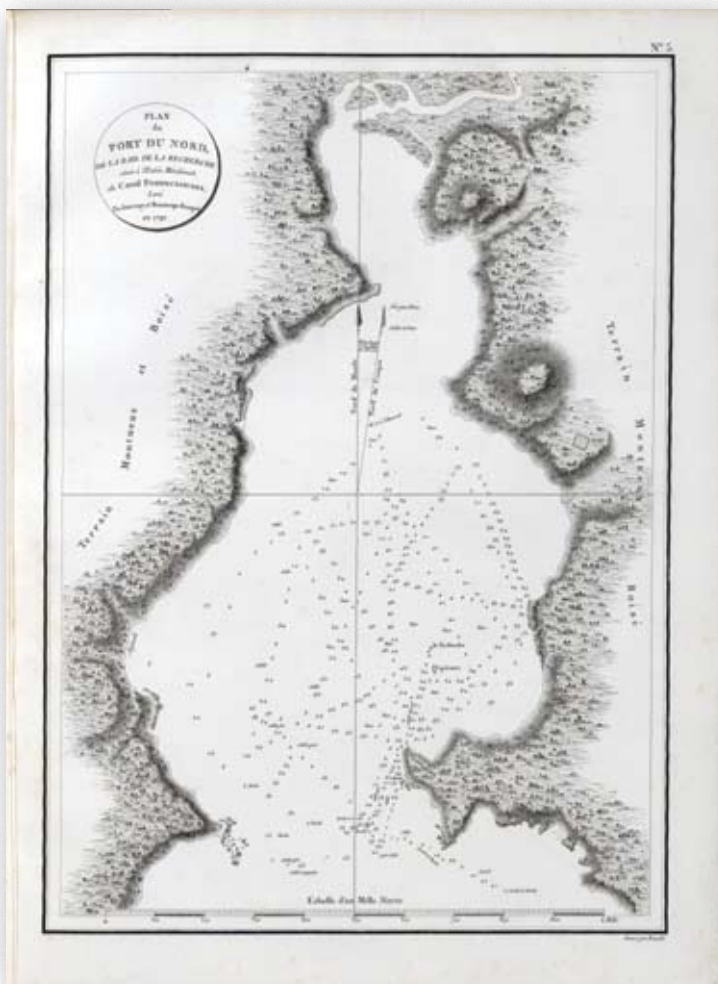
National Library of Australia

below right: During the time spent by the French at Recherche Bay, Rossel made a number of observations of the intensity of the earth's magnetic field at the site, by timing the oscillations of the dip needle of the instrument shown here.

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The observatory was located on what is now Bennett's Point, and on the shores of Coal Pit Bight separating the observatory and garden were the site for a carpenter's work area and boat repair yard with forges, a washing area for the ship's laundry, guard tents and the marines and general tents for the crews of the ships as they were being careened. Charcoal was burnt for the ships forges, and the ships themselves were careened and caulked. The site has not been systematically surveyed to determine if any physical remains survive related to these activities, though some have been inferred to do so.

At the Bennett's Point observatory Rossel, on May 11 1792, took a number of observations of the intensity of the magnetic field, by timing the oscillations of the dip needle (an instrument consisting of a circle within which a needle is pivoted





in the vertical plane to measure the vertical angle of the magnetic field). These observations, together with others made at Amboina, Surabaya, Teneriffe and Brest during the voyage, helped establish for the first time that magnetic intensity increased towards the South Pole, just as it did as the North Pole was approached.<sup>172</sup> The measurements of magnetic intensity were repeated at the observatory on the southern side of Recherche Bay, at Rocky Bay, when the expedition returned there in 1793. These observations, made on 7 February, confirmed the original observations and discounted error in the dip circle itself.<sup>173</sup>

While the immediate objective of magnetic research was to try to use magnetic declination in establishing longitude at sea, the Recherche Bay observations were of value to pure science as well, being one of a set of observations made by the expedition that resulted in a major advance in the understanding that the earth's magnetic field was symmetrical. Edward Sabine, the British polar explorer and magnetician, writing in 1838, recognised Rossel as 'having been the first who ascertained that the magnetic intensity is different at different positions on the earth's surface', even though his observations were not published until after those of von Humboldt, the great German scientist, who came to the same conclusion.<sup>174</sup>

During the second stay of three weeks in January-February 1793, the ships moored in Port du Sud (now Rocky Bay), on the southern side of Recherche Bay. Here they established another observatory.<sup>175</sup> The purpose of these observatories was to take astronomical observations to fix longitude and rate the chronometers, and to establish the local magnetic variation and dip (declination), that would affect the compasses and bearing taken from them, and the measurement of the intensity of the magnetic field, as described above. With the partial exception of the intensity measurements, the observations appear to have been related to practical navigation rather than to pure research.

The major geographical outcome of the stay at Recherche Bay was the mapping of the d'Entrecasteaux Channel, Huon River, Bruny Island, the estuary of the Derwent, and the general form of Storm Bay. The charts produced by the expedition's hydrographer, Beautemps-Beaupré, were made with a method developed by him, which substantially improved the accuracy of coastal survey.<sup>176</sup> Whereas Cook had used the sextant and theodolite for his surveys, Beautemps-Beaupré utilised the reflecting circle (referred to as the 'repeating circle' or 'full circle' by the British), invented in 1758 by German astronomer Tobias Mayer, and perfected by French hydrographer Jean-Charles de Borda (after whom Baudin named Kangaroo Island on his charts, the name surviving in 'Cape Borda') in 1772.<sup>177</sup> The reflecting circle allowed multiple horizontal angles to be taken to prominent points on the coast with far greater ease than with the sextant, with its restricted arc, or with the theodolite, which required a stable base and was hence difficult to use at sea. The charts were vastly superior to anything the British had produced for the region, and accurately delineated the detail of the d'Entrecasteaux Channel and Storm Bay area for the first time.<sup>178</sup> The success of the expedition in charting southern Tasmania, when added to by Baudin's wide-ranging visit in 1802, raised British fears of French intentions in southern Australia, and stimulated the British settlement of Port Phillip and Hobart in 1803 and Launceston in 1804.

During the stay the scientists, Labillardière and Deschamps, collected an estimated 5 000 specimens, comprising 30 genera and about 100 species.<sup>179</sup> Among the discoveries for science were *Eucalyptus globulus*, *E. cordata*, probably *E. viminalis*, *E.*





Esperance Bay, where d'Entrecasteaux's expedition landed in December 1792, taken from the memorial on Cape Le Grand.

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*ovata* and *E. amygdalina*, the cherry ballart (*Exocarpus cupressiformis*), the butterfly flag (*Diplarrhena moroea*), the red earthstar mushroom (*Aseroa rubra*), the sedge *Gahia grandis*, Tasmania Christmas bells (*Blandifordia punicea*), leatherwood (*Eucryphia lucida*), two *Lobelias*, a banksia, four species of *Epacris*, four new orchids, a number of species of sundew, *Coreas*, two melaleucas and an *Embothrium*.

Labillardière is sometimes also credited with *Richea glauca*, named after Lieutenant Riche, but his species was recognised in 1826 as a *Craspedia* that had already been described by Forster in 1786. However, Robert Brown, Flinder's botanist, named a member of the *Epacris* family 'Richea' after Riche, in 1810.<sup>180</sup> Visiting Adventure Bay on the east coast of Bruny Island, d'Entrecasteaux found three fig trees, two pomegranates and quince probably planted by Bligh in 1788, but could find no trace of two pigs left by Cook. He left two goats each at Recherche Bay and Adventure Bay.

Between the two visits to Recherche Bay, d'Entrecasteaux had sailed north-east to New Caledonia and New Britain, around the top of New Guinea to Timor, then south to strike the Western Australian coast at Cape Leeuwin. He then coasted along the southern coast, passing King George Sound, mapped by Vancouver in 1791. The expedition landed at Esperance Bay on 9 December 1792, in a location protected by the many offshore islands and the closer Observation Island. Willaumez and Beautemps-Beaupré surveyed the offshore island by boat. This large cluster of islands, to be named the Archipelago of the Recherche, had been seen by Nuyts and roughly located on his small-scale map in 1627, but had not since been accurately surveyed.

During their eight-day stay, penguins and seals were eaten, Aborigines were seen from a distance, naturalist Claude-Antoine-Gaspard Riche got lost for several days, and Labillardière collected new species of *Leptospermum*, *Lobelia heterophylla*, *Eucalyptus cornuta*, genus *Anigozanthos* (kangaroo paws), and *Banksia repens* (later



reclassified as *Dryandra nivea*).<sup>181</sup> Upon leaving Esperance Bay the ships were held up by adverse winds, and d'Entrecasteaux took the opportunity to further survey and chart the islands as they slowly made their way eastward over the next seven days, before coasting along the Great Australian Bight, then heading again for Tasmania.

While d'Entrecasteaux added only a relatively modest area of coast to the known continent, the expedition was a major one, largely because of the botanical work of Labillardière, and the cartography of Beautemps-Beaupré.

The French navigators following d'Entrecasteaux, Baudin and Freycinet, while less than a decade later, fall more accurately into the next chapter, on solving the final New Holland puzzles and producing a clear picture of Australia.

## MAPPING THE COAST—OVERVIEW 1768-1792

The major contributions to knowledge of the New Holland coast in this period were the definition and charting of the east coast by Cook, the initial charting of Torres Strait, which had for so long eluded the Dutch navigators, and the wealth of scientific investigation by the expeditions of Cook and d'Entrecasteaux. In addition, the south coast of Tasmania and parts of the south-west coast of Western Australia were well-charted for the first time, and the first formal national claims of possession were made by the British and the French.

Except for the harbours where Cook anchored—Botany Bay and Endeavour River—his mapping of the coast was a running survey (albeit a masterful one), with the low-resolution of detail that method entailed. The subsequent English and French navigators mapped small sections of coast, some simply refining work already done by others. It was Beautemps-Beaupré's work on d'Entrecasteaux's expedition that set a new standard for coastal charting, a standard that was to be maintained by his successors, Baudin and Freycinet, and by Flinders, during the next phase of exploration and survey. On the same expedition, Rossel's magnetic observations were a world first, but he was unfortunate in that Von Humboldt, who had been undertaking similar but more extensive research, published his later work before Rossel was able to get his to press.

While adding little to the knowledge of Australia, Lapérouse's landing at Botany Bay in 1788, days after the arrival of the First Fleet, added to the suspicion of French intentions that was to continue until at least the end of the Napoleonic Wars. Lapérouse's Landing Site, at the suburb that bears his name, is one of the important early sites in Australia's history, and one of a series of French expeditions that stimulated British exploration and settlement efforts.

The settlement of Norfolk Island within weeks of the British settlement of New South Wales to secure potential naval resources for what was to be the pioneering British foothold in the Pacific is a classic illustration of the nexus between exploration and strategic planning.

Places that stand out as potentially significant in this period are:

- Cook's landing places, but especially:  
Botany Bay



Endeavour Reef

Endeavour River

Lizard Island

Possession Island

- Furneaux's Adventure Bay (with added layers of association from later visitors)
- d'Entrecasteaux's centres of activity at:  
Recherche Bay (both Pigsties Bay and Rocky Bay)  
Esperance Bay and the Recherche Archipelago
- Vancouver's King George Sound (which has later important associations as well)
- Pandora Reef, as the wreck site of the *Pandora*
- Marion Dufresne's North Bay, as the first point of contact with Tasmanian Aborigines
- Port Jackson and Norfolk Island, as the first British settlements in the Pacific, placing Australia in a global strategic perspective.







# 5

## NEW HOLLAND BECOMES AUSTRALIA

The next phase of exploration and survey was in the context of the European settlement of Australia, firstly at Sydney and then at a number of other locations around the coastline. With settlement came pressure to better survey the coastline, to protect the shipping supplying the colonies by the identification of hazards and the charting of shipping lanes, and to survey the potential of land for the subsequent expansion of settlement.

### THE EXPLORER-SURVEYORS—1792-1814

In the two decades following the first European settlement at Port Jackson, there still remained large sections of the Australian coast either not yet visited by Europeans, or charted with uncertain accuracy. The expeditions of Bass, Flinders and Baudin and his colleagues fulfilled the roles of both exploratory voyages and coastal survey expeditions. Their work completed the outline mapping of the Australian coastline, though it still left substantial detailed coastal survey to be done and some outstanding gaps for later hydrographers to fill.

#### ***George Bass, Matthew Flinders and the early colonial surveyors***

Matthew Flinders arrived in the colony of New South Wales in September 1795 at the age of 21, as midshipman aboard HMS *Reliance*, carrying the colony's second Governor, John Hunter, to Sydney. Also aboard the *Reliance* was surgeon George Bass, aged 24. Bass brought with him a 3 metre long (2.4 metre keel) rowing boat, named *Tom Thumb*, and within little more than a month of their arrival, Bass and Flinders with Bass' assistant William Martin, sailed *Tom Thumb* south to Botany Bay and explored the George's River. In March 1796 the trio took a slightly larger boat, also named *Tom Thumb*, and sailed south as far as Lake Illawarra, 80km south of Sydney.<sup>182</sup>



Exploration of the Bass Strait area was stimulated by the loss of the ship *Sydney Cove*. Towards the end of a voyage from Calcutta to Sydney on 9 February 1797, Captain Guy Hamilton ran his leaking ship onto Preservation Island, immediately south of Cape Barren Island in the Furneaux Group in the eastern approaches to Bass Strait. The crew got ashore safely, but the ship was a complete wreck.<sup>183</sup>

On 28 February a longboat was sent with 17 men aboard to sail to Sydney, commanded by the Chief Mate Hugh Thompson, but was wrecked on the Australian mainland near Point Hicks (now Cape Everard). All 17 men made it ashore, but only three of them survived the fatigue and conflict with Aborigines experienced during the subsequent 800km walk to Sydney, which they reached on 15 May after being picked up by a boat just south of Port Hacking.

The *Francis* and the *Eliza* left Sydney for Preservation Island on 30 May, and rescued the rest of the crew and much of her cargo. Six men stayed behind to guard the remaining cargo. The *Eliza* disappeared on the return voyage, presumably foundering and taking an estimated 12 men with her.

In December 1797, Bass set off in a whale boat to determine if a strait existed separating Tasmania from New South Wales (Victoria was not to exist as an independent colony for another 54 years). Flinders was engaged in duties aboard the *Reliance* (having been promoted Lieutenant), and could not accompany Bass. In his three month voyage, Bass rounded Wilson's Promontory and discovered Westernport, and on his return trip entered Corner Inlet.<sup>184</sup>

Bass attempted to reach the *Sydney Cove* wreck during his whaleboat exploration, but was driven back to the Victorian coast by bad weather. The *Francis* was sent back to the *Sydney Cove* wreck site to collect cargo in December 1797, returning in January 1798, and then made yet another voyage to the wreck in February, with Matthew Flinders aboard. Flinders was able to carry out some survey work charting the Furneaux Group before the *Francis* returned to Sydney.<sup>185</sup> The wreck of the *Sydney Cove* was rediscovered in 1977, and several archaeological excavations have taken place since that date.<sup>186</sup>

The various voyages in connection with the *Sydney Cove* wreck established the geography of the eastern entrance to Bass Strait. Bass' success and the wreck of the *Sydney Cove* stimulated Governor Hunter to provide Bass and Flinders with the *Norfolk*, a small sloop built on Norfolk Island, for another voyage to Bass Strait. Bass' whale boat trip had not established the insularity of Van Diemen's Land, but this seemed likely and resolving the issue was made the chief objective of the *Norfolk's* itinerary. The *Norfolk* sailed from Sydney on 7 October 1798, with Flinders in command, and with Bass and an eight man crew aboard. The ship surveyed Twofold Bay, passed to the western side of the Furneaux Group off the north-east corner of Tasmania and then cruised along the northern Tasmanian coast, discovering and exploring the Tamar River (Port Dalrymple), and on 9 December reached the western end of the north coast at Cape Grim, establishing that Van Diemen's Land was indeed an island. The *Norfolk* then proceeded down the west coast and around the south of the island, reaching the Derwent on 21 December. Bass climbed Mt Wellington on Christmas Day, and the *Norfolk* sailed for Sydney on 3 January 1799, reaching Port Jackson on 11 January.<sup>187</sup> Bass recorded the first anatomical dissection of a wombat, and observations of many bird species.



Bass and Flinders' descriptions of the wealth of seals on the islands they saw stimulated the sealing industry to expand to Bass Strait.

Flinders sailed again in the *Norfolk* in July 1799 to chart the southern coast of what is now Queensland. Bass had returned briefly to England, but Flinders was accompanied by Bungaree, an Eora man from Port Jackson, as interpreter. Bungaree, who was also to travel with P.P. King on his surveys of the north coast, has at least two coastal features named after him, Bungaree Shoals in Torres Strait, and Boongaree Island in Prince Frederick Harbour on the north-west coast.

The experience of Bungaree says much about the nature of early culture contact involving explorers and Aborigines. Bungaree undoubtedly was able to inform and educate his fellow expeditioners on aspects of Aboriginal culture and perspectives on the land. For example, he helped the explorers understand some aspects of the natural history of the coast—King tells how Bungaree instantly recognised a very large bird's nest, that King thought would have to be that of a bird at least as large as the South American condor, as that of the sea eagle<sup>188</sup>—and used his hunting and fishing skills to good effect collecting both specimens and food. His bush skills were also called upon to find water sources at landing places.

However, Bungaree was beyond his own country, and was unable to understand, or make himself understood by, the Aboriginal groups encountered around the coast. 'Poor Bungaree' said King, '...upon all occasions forgets his native tongue and addresses them in Broken English—it is of little consequence for he does not understand one word uttered by them.'<sup>189</sup> In this role as interpreter, he appears to have been of little more success than de Vlamingh's Cape Africans. So the detailed knowledge held by the Aborigines met with—knowledge of their country, its resources and their relationship with it—remained hidden from both Bungaree and the explorers. While his interpretation services were a failure, Bungaree, being an initiated man with the scars to prove it, was able to break the ice with several Aboriginal groups once convinced by King to take off his clothes. Those explorers and surveyors who did not have a Bungaree with them would have had even less success in making contact with local Indigenous people.

The extent to which Bungaree retold his experiences of the wider Aboriginal world to his tribesmen and women back in Sydney is not documented.

While the intention of Flinders' six-week voyage was to discover any rivers than might give access to the interior, Flinders failed to find the Clarence or the Brisbane rivers, though he moored near both. No other major rivers were identified, though the expedition succeeded in charting large parts of Moreton Bay (Cook's Glass House Bay) and Hervey Bay.

Returning to Britain in 1800, Flinders was promoted to Commander and sent back to New South Wales in HMS *Investigator* to chart the southern coast and areas not touched by Cook. The *Investigator's* complement of 83 included the botanist Robert Brown, botanical artist Ferdinand Bauer, and artist William Westall, who were to record many aspects of Australia's natural history during the coming survey, as well as an astronomer, gardener and miner.<sup>190</sup>

Reaching Cape Leeuwin on 6 December 1801, Flinders started his survey of the south coast. Surveying King George Sound and passing through the Recherche Archipelago and along the cliffs edging the Roe and Nullarbor plains, Flinders was





left: Drawing in ink and wash by William Westall, about 1801, of King George Sound viewed from the north-west.

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below: Memory Cove, near Port Lincoln, SA, named by Flinders in memory of a boat's crew from the *Investigator* lost near Cape Catastrophe. The copper plate shown in the photograph was placed there by the South Australian Government to replace the badly deteriorated one left by Flinders in 1802.

National Library of Australia

roughly following a route established as long ago as the voyage of the *Gulden Zeepaard*, 174 years earlier, and in part already visited by Vancouver and d'Entrecasteaux (as far as Cape Adieu). However, Flinders' survey was far more detailed than any that had gone before. He spent over three weeks in the King George Sound area, and in the Recherche Archipelago landed at Lucky Bay and Thistle Cove, as well as on Middle Island and a number of other islands. Beyond the Nullarbor, Flinders landed at Fowlers Bay, and found penguins in the St Francis Group and seals on St Peter Island in the Nuyts Archipelago.

Beyond Ceduna, Flinders was on new ground. He found seals on the *Investigator* Group of islands, and located the entry to a large gulf, exciting speculation that this might be the entry to an inland sea, or a passage linking to the Gulf of Carpentaria. While anchored at Thistle island off Port Lincoln on 21 February 1802, the ship's Master, John Thistle, and a boat crew of seven men were lost, and their names given to the surrounding islands and the adjacent Cape Catastrophe and Memory Cove. Flinders left an inscription on a copper sheet at Memory Cove, and a fragment believed to be from this sheet is in the SA Library. The *Investigator* moored at Port Lincoln for ten days following the loss of the boat crew, replenishing water and wood, and a monument has been erected there. Spencer Gulf was then charted to its head, proving there was no inland sea or passage north.



Kangaroo Island was sighted when exiting Spencer Gulf, and its north shore charted before entering Gulf St Vincent and charting it. Having passed between Kangaroo Island and the mainland via Backstairs Passage, on 8 April the *Investigator* came across the French navigator Nicolas Baudin in the *Geographe* at what Flinders named Encounter Bay, in south-eastern South Australia. Baudin was intent on the exploration of the same south coast that Flinders had just surveyed, and Baudin's maps of his post-Flinders reconnaissance are littered with French place names totally



ignoring Flinders' earlier charting, and the coast between Western Port and Nuyts Archipelago he named Terra Napoleon.

Unknown to both Flinders and Baudin at the time were John Grant's 1800-1801 survey work in the *Lady Nelson*, which extended from Cape Northumberland to Western Port, in the process becoming the first ship to pass through Bass Strait west to east, and John Murray's discovery of Port Phillip Bay, also in the *Lady Nelson*, in March 1802. This denied Baudin priority over even more of the coast he had surveyed before meeting Flinders.

From Encounter Bay Flinders continued southward, entering Port Phillip Bay in ignorance of its earlier discovery by Murray, and then continued to Port Jackson.

After replenishing stores in Sydney, Flinders' survey continued up the east coast on 22 July 1802. He was provided with the colonial sliding-keel brig *Lady Nelson* as an escort, and made up his diminished crew with nine convicts. Bungaree again joined him as interpreter, together with Nanbaree (who later returned to Sydney on the *Lady Nelson*). Entering Hervey Bay on 30 July by a passage reported by whalers, the *Investigator* was anchored off Sandy Cape, and Flinders went ashore and had a meeting with an Aboriginal group, exchanging gifts with them. Flinders made observations of the strength and location of the East Australian Current, and attributed to it in part the slowness of the *Lady Nelson* in making their rendezvous at Hervey Bay. Murray had sailed the *Lady Nelson* well out to sea in the strongest part of the current, while the *Investigator* worked northward close to shore, landward of the current.

Further landings were made at Port Curtis and Keppel Bay, Port Bowen, Shoalwater Bay, Broad Sound, and the Percy Isles. As the reef navigation became more troublesome, at the Cumberland Islands Flinders sent the less manoeuvrable *Lady Nelson* back to Sydney. The *Investigator* found a passage through the Outer Reef, now named Flinders Passage, off the township of Ayr, and left the Great Barrier Reef at this point. Flinders' instructions were to find a passage through the Torres Strait that would be safer for commercial shipping than those already known. He therefore sailed northward through the Coral Sea to Torres Strait, and found a passage he named Pandora Entrance, (not to be confused with the Pandora Entrance near Raine Island) after HMS *Pandora* which had been wrecked further south in 1791 after having been unable to penetrate the Outer Reef at this point. The Pandora Entrance did not become a major shipping route. After meeting and bartering with Murray Islanders in canoes, Flinders passed safely through Prince of Wales Channel north of Thursday Island (used by Bligh in 1789 and Edwards in 1791), and entered the Gulf of Carpentaria on 3 November.

A landing was made at Archer River, and the Dutch charts, which Flinders described as 'little better than a representation of fairyland'<sup>191</sup> were corrected and augmented as the *Investigator* moved methodically southward, reaching the southern extremity of the Gulf on 15 November. As the shore was followed to the north-west, the offshore islands were surveyed and a number of landings made. A number of observations of Aboriginal people and their material technology were noted in Flinders' journal.

In the South Wellesley Islands, on 17 November 1802, Flinders identified a hill noted by Tasman. This turned out to be an island, named Sweers Island by Flinders after Salamon Sweers, a member of the Batavia Council of the Dutch East India Company, in recognition of Abel Tasman's original discovery. Tasman's hill was in fact the high



point of the island, and the inlet behind it had been mistakenly named Maatsuykers River.<sup>192</sup> Sweers Island was an important site for Flinders, and was to have a long association with the early settlement of the Gulf coast.

Investigator Road between Sweers Island and Bentinck Island, surveyed by Flinders, as a safe anchorage during both monsoons, was used by Flinders as the location to careen and inspect the hull of the *Investigator*. Already aware that the timbers of the hull were rotting, the inspection indicated that the damage was severe, and caused Flinders to decide to return to Port Jackson immediately. While the most urgent repairs were being carried out, the crew lived in tents ashore, and the ship's gunpowder was dried in the sun. Flinders watered the ship from a well he sank on the island, and had the name of the ship carved on a small tree at Point Inscription. The *Investigator's* botanists worked on both islands while the ship repair and watering proceeded.

Because of the dire condition of the *Investigator's* hull revealed by the inspection at Sweers Island, Flinders decided to sail back to Port Jackson around the west coast before the monsoon season put more strain on the vessel.

Thirty nine years after the *Investigator's* visit, J.L. Stokes anchored the *Beagle* in Investigator Road in July 1841, located Flinder's well and the carved tree, and had the name 'Beagle' carved on the opposite side of the trunk. He named the site Point Inscription.<sup>193</sup> Stokes had another well dug, and found it as reliable a source of water as had Flinders. Stokes named the first river he discovered in the Gulf after Flinders, in recognition of his pioneering voyage and in tribute to his memory. The tree was subsequently engraved by many others, and after being blown over in a cyclone in 1887 the engraved limb was given to the Queensland Museum where it is still held. Sweers Island was the site for a settlement from 1866 to the early 1870s, to be replaced by Normanton as the main government centre on the Gulf.

The western side of the Gulf was surveyed, and conflict on Woodah Island led to the deaths of several Aborigines, and one of the crew (another dying of sun stroke).

While surveying the eastern Arnhem Land coast, Flinders encountered six praus among the islands on 17 February 1803, at a place he named Malay Road. The commander of the squadron, Pobassoo, gave Flinders information about the Macassan trepang trade that enabled him to identify remains he had seen in the Gulf of Carpentaria as trepang campsites. Flinders left the coast at the Wessel Islands, and sailed to Timor then around the west coast well out to sea. The only landing on the return to Sydney was made at the Recherche Archipelago, where Flinders anchored, on 17 May 1803, at Goose Island Bay on Middle Island to obtain geese and seals as fresh food for his crewmen sick with scurvy. Boatswain Charles Douglas was buried on the island.

Flinders' plans to return to England and seek a better vessel than *Investigator* to continue his survey, were thwarted by the wrecking of the *Porpoise*, the vessel in which he was a passenger, on Wreck Reef, and his subsequent voyage toward England



*The Hamelin Pool in Shark Bay, named after Baron Jacques Felix Emmanuel Hamelin, captain of the Naturaliste and a member of Baudin's expedition.*

Department of the Environment and Heritage





*Encounter Bay*, a lithograph by J W Giles from a drawing by George French Angus, produced in 1847. It was at *Encounter Bay* that the French Baudin expedition met the British navigator, Matthew Flinders. National Library of Australia

in the less seaworthy *Cumberland*, necessitating taking refuge in Mauritius, where Flinders was imprisoned for seven years. He returned to Britain only long enough to see his journals through publication, dying a day after publication, on 19 July 1814.

### ***Nicolas Baudin, Emanuel Hamelin and Louis Freycinet***

In October 1800 the ships *Géographe*, with expedition leader Nicolas Baudin aboard, and *Naturaliste* under the command of Emanuel Hamelin, left Le Havre on an expedition to complete the cartography of New Holland. The other purposes of the voyage have been a matter of conjecture, Governor King being sure that the French were seeking information on both the status of the British colony, and the opportunities to establish a French settlement in Australia. Baudin's instructions certainly required him to report whether Britain had as yet established a colony in Tasmania.<sup>194</sup>

Baudin's survey started at Cape Leeuwin in May 1801, carrying out a detailed survey of *Géographe* Bay north to Rottnest. The ships becoming separated, Baudin in *Géographe* sailed north to Shark Bay well off-shore, and spent two weeks doing a survey of the northern section of Shark Bay and Bernier Island, where the horticulturalist Reidlé collected 70 species of plants. Baudin then travelled up the coast at some distance, being a day or two out of sight of land from time to time. He suspected an entrance existed behind North West Cape, but did not investigate it, then touched at Depuche Island, and again in the Bonaparte Archipelago, naming prominent points as he went. From the Bonaparte Archipelago Baudin headed to Timor to refresh. Hamelin on the *Naturaliste* sent Freycinet to investigate Rottnest Island, while other parties explored the islands south of the Swan and up the river for 88.5 km. On the voyage



north to Shark Bay, Hamelin was only occasionally close enough to the coast to make detailed observations, but at Shark Bay boats under the command of Freycinet and Faure spent seven weeks surveying the southern sections of the bay (see their chart below). De Vlamingh's plate was found fallen from its post on Dirk Hartog Island, but Hamelin ordered it re-affixed to a new post and left where it was.

Joining up again at Timor, the expedition sailed directly to Tasmania, reaching the D'Entrecasteaux Channel on 13 January 1802. The two months spent in Tasmania were the most productive of the expedition.<sup>195</sup> The surveys of Beautemps-Beaupré and Flinders were augmented, and the Derwent River, Storm Bay, Tasman Peninsula, Maria Island and Great Oyster Bay, the east coast north to the Furneaux Group and the north coast to Port Dalrymple were all surveyed. Substantial ethnographic information was gained from largely friendly encounters with Aboriginal groups at the D'Entrecasteaux Channel, Maria Island and other locations.

The ships then sailed across Bass Strait to Wilson's Promontory, and made a running survey along the Victorian coast, not knowing of Grant's earlier work there. After



left: Louis de Freycinet's sketch map of Shark Bay, drawn during the Baudin expedition in 1803. Plate 13 from "Voyage de decouvertes aux terre australes: execute par ordre de SM L'Empereur et Roi sur les corvettes Le Geographe, le Naturaliste, et la Gollette Le Casuarina, pendant les anes 1800, 1801, 1802, 1803, et 1804". Volume 2. Published in Paris in 1811.

National Library of Australia

right: Denham's chart of the same section of Shark Bay drawn in 1858, showing the development of naval cartography over approximately 50 years. From "Chart of the West Coast of Australia. Sheet VIII", published by the Hydrographical Office of the Admiralty, London, 1872.

National Library of Australia







Second Lieutenant on HMS *Sirius* in the First Fleet, and the third Governor of New South Wales. P.P. King followed his father into the Royal Navy, and by 1817, aged 25, he was a lieutenant. In that year King was given the task of completing Flinders' coastal survey, and in the following three years made three voyages round the mainland, and another to Macquarie Harbour in Tasmania in the *Mermaid*, then in 1821-1822 made a fifth voyage in the *Bathurst*. King charted those areas not visited or intensively charted by Flinders: most of the west coast, the Kimberley and Arnhem Land coasts, Macquarie Harbour in Tasmania, the Torres Strait approaches, eastern Cape York north of Princess Charlotte Bay, and much of the coast along the inner passage of the Great Barrier Reef.<sup>196</sup>

On arrival in Australia, King was lucky in that a new ship had just become available to the colonial administration, the 17m long cutter *Mermaid*, which was a far superior survey vessel to the other ship available, the *Lady Nelson*. King departed on his first voyage on 22 December 1817, with a crew of 19 including assistant surveyors Frederick Bedwell and John Septimus Roe, the botanist Allen Cunningham, and the veteran Aboriginal voyager, Bungaree. Touching at King George Sound, the *Mermaid* proceeded to North West Cape where the first survey started, charting sections of the coast north and west as far as Van Diemen's Gulf.

King discovered and charted Exmouth Gulf behind North West Cape, and lost two of his three anchors in the process. King proceeded up the coast, surveying the Dampier Archipelago, where he captured and described an Aboriginal man caught crossing Mermaid Sound on a log raft, and named the adjacent islands the Intercourse Islands.

*Phillip Parker King's cutter, the Mermaid, off Cape Banks, from a watercolour by Conrad Martens drawn in 1820.*  
National Library of Australia





Next day King, together with Bungaree, Bedwell and Cunningham landed and had a friendly encounter with a group of Aboriginal men, but met an aggressive rebuttal on another island, King withdrawing without retaliating.<sup>197</sup> In some parts of the archipelago, King named newly found features, but also gave new names to some places previously named by Baudin. On completion of his survey, King compared his chart with that of Baudin, and, realising what he had done, restored the French names. He noted that the longitudes given by the French for the archipelago were so different from his own (which vary little from the modern charts), that at first he did not recognise it as the same one seen by them.<sup>198</sup>

From Depuch Island, east of the Dampier Archipelago, King veered out to sea because the offshore winds made it impossible to maintain close contact with the coast, and headed for Arnhem Land, on his way fixing the position of Rowley Shoals, discovered in 1800 by Captain. Josias Rowley in HMS *Imperieuse*, and added Clerke Shoal and Mermaids Reef to the map as part of the same group. Reaching land at Cape Van Diemen on Melville Island, King sailed as far east as he could before the onset of the south-easterly winds at the end of the monsoon forced him to turn west. This he did at Braithwaite Point on 26 March 1818. The *Mermaid* then continued its running survey along the Arnhem Land coast and Coburg Peninsula. At South Goulburn Island Aborigines harassed King's men and attempted to steal the ship's largest boat, and while a watering party was gathering water at a stream running beneath a cliff, found by Bungaree, Aborigines threw stones down upon them. Cunningham gathered many specimens from Goulburn Island, and named the adjacent Sims Island after the editor of the *Botanical Magazine*. King returned to the watering point on each of his expeditions, showing the scarcity of water on the coast.

After encountering a fleet of Macassan praus in Mountnorris and Malay Bays, King surveyed the north coast of Coburg Peninsula and discovered Croker Island, Raffles Bay, and Port Essington. Then, after further encounters with Macassan trepangers, he rounded Cape Don and passed through what he named Dundas Strait into what the

View of the inner harbour at Port Essington, from Speer Point, from a sketch drawn by Phillip Parker King. This aquatint was prepared from the original drawing by John Murray in London in May 1825.

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Dutch had named Van Diemen Bay, an area of particular interest to the Admiralty, and featuring largely in King's instructions. Tasman had discovered the bay, and Martin van Delft had been sent in 1705 to investigate what was thought might be the start of a channel dividing the continent. However, van Delft had little success, and the Gulf was still a mystery when King entered it on 26 April 1818, allowing hopes that it was the entrance to Oxley's much hoped for inland sea. The southern side of the Coburg Peninsula is littered with the names of King's crew and their friends and mentors—Mt Bedwell, Mt Roe, Aiton Bay for Cunningham's mentor, the head gardener at Kew, Burford Island, for King's former headmaster—as well as the names of the more grand patrons, such as Coburg Peninsula after Prince Leopold of Saxe Coburg.<sup>199</sup>

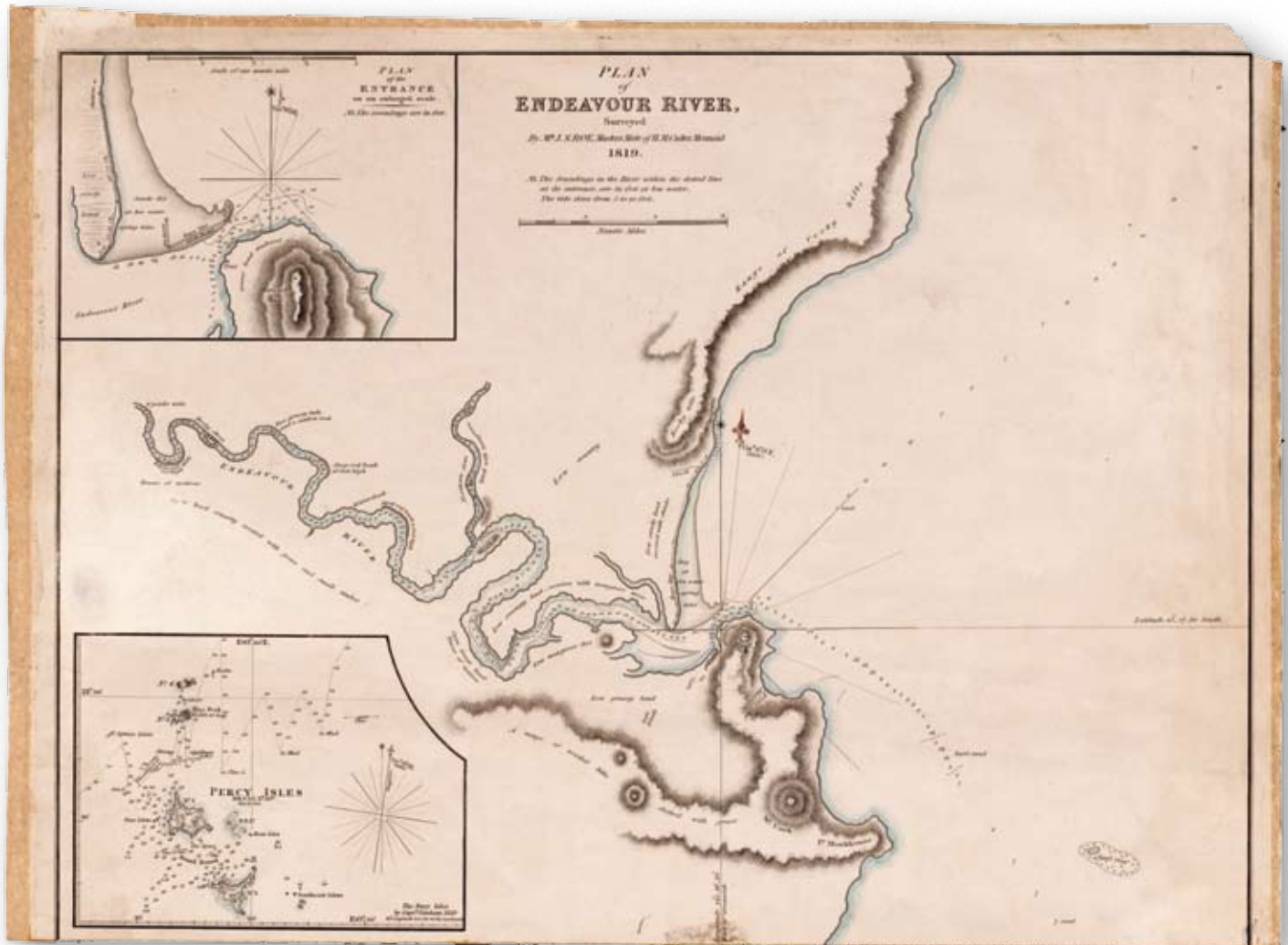
King tested the eastern and southern shores as far as the shallowing mud flats would allow, and entered the East Alligator River by boat, and then the South Alligator River with the *Mermaid*, taking the ship and then the boat an estimated 64.5 km up-river, but clearly neither was the hoped-for channel to the inland sea. King did not even try entering the West Alligator River. Recognising that it did not lead to any great entrance to the south, King renamed the bay Van Diemen Gulf. Fearing that the western end of the gulf might be enclosed, trapping him on a lee shore, King headed back to Dundas Strait. Rounding north of Melville Island, King discovered the Apsley Strait separating Melville from Bathurst Island, where he had a confronting encounter with Tiwi people. Believing this to be the channel to the inland sea, King followed it south, only to find the open sea (Clarence Strait) on the far side. King then realised that this stretch of water probably connected with Van Diemen's Gulf. Caught by the tide, King was swept back up Apsley Strait, and chose to return to the start and survey the west coast of Bathurst Island, some capes of which had been previously named by Freycinet. Having rounded Bathurst Island and sighted the southern point of Melville Island, King headed to Timor to replenish ship before the long return to Port Jackson. On the voyage he sighted and named Barrow Island, while searching for the Trial Rocks.

After a refit in Sydney, the *Mermaid* went to survey Macquarie Harbour, lately discovered by James Kelly during a whaleboat journey around the island. Then, in May 1819, King sailed for Torres Strait. The *Mermaid* (with John Oxley aboard) was accompanied by the *Lady Nelson* as far as the Hastings River, which King surveyed before parting company with both *Lady Nelson* and Oxley. Further north King approached the land again near Mt Warning, looking for a river, but missed seeing what Oxley discovered and named the Tweed River three years later. King made his way up the Queensland coast, refining Cook's and Flinders' charts, and spent a week at Endeavour River repairing his ship and constructing a new boat (a whaler) from prefabricated frames and local timber, on the very spot where Cook had repaired the *Endeavour*. There King and Roe carried out a survey to update Cook's chart, while Cunningham augmented Cook and Banks' information about local flora and Aboriginal ethnography and language. Cunningham found that the word 'kangaroo' was not recognised as a representation of the animal, and Beaglehole has suggested that Banks may have applied the Aboriginal word for 'I don't understand' to the iconic kangaroo.<sup>200</sup> During the east coast voyage, Cunningham was to collect some 350 specimens, and honour a number of his botanical patrons and peers in place names.

Until 1812 no Europeans (other than the Bryant party of escaped convicts in 1791) had sailed inside the Great Barrier Reef in the 300 km section between Cape Flattery, where Cook left the coast to exit the Barrier Reef, and Restoration Island, north of Cape



Direction, where Bligh met the coast on his boat voyage after the mutiny on the *Bounty*. Flinders had left the coast further south, off Ayr. In 1812 Captain Cripps of the merchant brig *Cyclops* sailed the entire inner route, but appears to have left no useful record. Three years later, in 1815, Lieutenant Charles Jeffreys in HM Brig *Kangaroo* sailed the inner route, naming many features in the 'unknown' sector, but only making a rough running survey of the coast. Due to an apparent enmity with Governor Macquarie, the explorer Jeffreys' voyage was not publicised (Cunningham said Jeffreys' chart had been suppressed) and he did not get due recognition for his proving the new route.<sup>201</sup>



*Plan of the Endeavour River, surveyed by Mr J S Roe, Master's Mate of HM Cutter Mermaid, in 1819. Published by the Hydrographical Office, London, 1860.*

National Library of Australia

King charted the hazardous new section on his way north to Endeavour River, retaining Jeffreys' geographical names, such as Princess Charlotte Bay and the Flinders Group of islands. At Cape Flinders, at the eastern end of Princess Charlotte Bay, King was amazed to find the wreck of a ship on the rocks. She was the *Frederick*, which had left Hobart and Sydney for Mauritius in company with the *Duke of Wellington* in June 1818. King later found, in Coepang, that five of the crew had been saved by the *Duke of Wellington*, but a boat containing the remaining 23 crew members was never seen again.<sup>202</sup> Surviving a near sinking at Escape River, the *Mermaid* was driven northwards by a series of gales, and around Cape York, to rejoin Flinders route north of Wednesday Island, losing two anchors in the wild weather. For the second time King was approaching his main survey area with only one of his three anchors intact.



Despite the hair raising experiences during his 11 weeks on the Queensland (then NSW) coast, King became a great advocate for the advantages of the inner route over that outside the Great Barrier Reef in the Coral Sea, and for many years the inner route was known as the King Route, and his sailing directions were the best available. The inner route gradually became the standard route to Torres Strait, as it remains today.

Having cleared the Torres Strait Islands, King sailed west via Booby Island to recommence his survey at the Wessel Islands off Arnhem Land, which he reached on 26 July 1819. From here, the limit of Flinders' survey of the northern coast, King commenced his close survey to the westward. The Liverpool River was investigated and discounted as yet another chance of being the entrance to the inland sea. King sailed west to link up with his previous year's survey at Braithwaite Point, then moved on to re-start the survey where he had left it the previous year, reaching the Vernon Islands and Charles Point, sighting but not investigating Port Darwin.

Working his way south and west, King tried to reconcile his survey with that of Baudin, with little success. Baudin had remained a distance out to sea, and King, close inshore, found several offshore islands not identified by Baudin, and found several of his islands to be misidentified inland hills. King found inlets at the mouths of the Daly and Victoria rivers, but was unable to explore further, leaving the discovery of the rivers to later surveyors.

Exploring behind Baudin's Lacrosse Island, King discovered Cambridge Gulf and followed its western arm into the Pentecost River, but the lack of much-needed water prevented him exploring the eastern arm, which was the mouth of the Ord River. Seaman William Nicholls, who died of natural causes, was buried on Adolphus Island, which separated the two river mouths. Heading north-west, the *Mermaid* covered a section of the coast already charted by Baudin's expedition. At Sir Graham Moore's Islands, King was able to use observations of a full lunar eclipse to accurately calculate his longitude, and then surveyed Admiralty Gulf, which had been missed by Baudin. The absence of drinking water drove King to sail from Admiralty Gulf on 16 October 1819 directly to Timor, and from there to Port Jackson.



View of the encampment at Careening Bay where the *Mermaid* was repaired, from a sketch drawn by Phillip Parker King. This aquatint was prepared from the original drawing by John Murray in London in May 1825.

National Library of Australia



In July 1820, after a false start in which the ship was damaged in a storm, the *Mermaid* again headed north via the inner route, surveying where possible to the east of his earlier tracks, to expand the knowledge of the coast and the Barrier Reef route. King stopped at Endeavour River again, to take a series of lunar observations to get an accurate longitude calculation. Passing through Torres Strait, King watered again at South Goulburn Island, then headed directly to pick up the survey again at Montague Sound, just to the west of Admiralty Gulf. Running south, King surveyed Prince Frederick Harbour, and just beyond there King chose Port Nelson as the site to careen the *Mermaid*, to repair the stern post damaged in an earlier grounding at Port Bowen in Queensland. While this was being undertaken, the carpenter found that the ship's fixings had deteriorated, and the hull was in a poor condition. At this spot, named Careening Bay by King, the crew carved the words 'HBMC Mermaid 1820' into the bark of two stems of a large boab tree, which remains clearly visible today (see photo of the tree below). A copper plate was also inscribed and attached to a tree.<sup>203</sup> After 19 days, the *Mermaid* sailed out of Careening Bay, and the survey of Brunswick Bay and its various inlets continued. One of these was St George Basin, into which ran the spectacular Prince Regent River, which King followed in a boat for 45 km. At Hanover Bay King had confrontations with Aborigines, his surgeon Montgomery being speared, and an Aboriginal man being shot in retaliation, and weapons and watercraft seized. From here King took the distressed *Mermaid* directly out to sea to start the voyage around western and southern Australia back to Sydney, where the ship was condemned as unfit for further northern work.

King was given the brig *Bathurst* for his final survey season, a larger ship allowing for a larger crew and an extended survey season. Leaving Sydney on 26 May 1821 in company with the *Dick*, the *Bathurst* was taken on the now standard route via Torres Strait. The commercial value of King's knowledge of the Barrier Reef route was demonstrated when a merchant ship, the *San Antonio*, overtook the expedition, then grounded on a shoal. The ship afterwards 'quietly fell into our wake, a station which he never afterwards left until all danger was over and we had passed through Torres Strait.'<sup>204</sup>

The 'Mermaid Tree', a boab tree at Careening Bay carved by King's crew with the words 'HBMC Mermaid 1820'.

Photo: Patrick Baker  
Western Australian  
Maritime Museum





Parting from the Calcutta-bound *Dick* on the Arnhem Land coast, the *Bathurst* proceeded to Brunswick Bay to continue the survey of the north-west coast. Watering at Prince Regent River Cascade, King refined his survey of Brunswick Bay and moved on into Camden Sound, Collier Bay and the Buccaneer Archipelago, south to Baudin's Cape Leveque (earlier seen by Dampier), King Sound, and on down the coast to the area of Broome. After refreshing at Mauritius, King returned to the south-west coast at King George Sound, where he collected important ethnographic information about the local Minang Aboriginal people. The *Bathurst* then carried out a running survey northward from Cape Leeuwin via Rottnest Island to Shark Bay, where King marked his presence at Inscription Point on Dirk Hartog Island on a deal plank and the words 'King 1822' marked out in nails on the pole left by Hamelin to support the de Vlamingh plate (the plate itself having been removed by Freycinet in 1818). King also raised a stone cairn on the adjacent cliff.<sup>205</sup> King then sailed on via North West Cape to Cygnet Bay in King Sound, and continued his survey of the sound before completing his west coast work and returning to Sydney.

## THE ROLE OF WHALERS AND SEALERS

Another important source of knowledge about the coast was the whaling and sealing industry. Whalers and sealers penetrated new territory in pursuit of their prey, and often preceded the explorers and surveyors. Their information was drawn on by Flinders and King, but most of their knowledge was kept secret to retain limited access to the resources while they remained. Only a fraction of whaling and sealing vessel logs and journals survive, and reminiscences are few, so their contribution to the wider knowledge of the coast was limited. Often their presence is only known because an explorer or surveyor came across them, as in the case of Flinders' sighting of whalers on the Queensland coast and Baudin's meeting with Captain Pendleton at Two Peoples Bay.

However, some knowledge gathered by whalers and sealers did become more widely known. Flinders, for example, was able to enter Hervey Bay in southern Queensland by way of a passage reported by whalers.

### *The sealers*

Sealers were known to frequent many parts of the Bass Strait and southern Australian coastline, but their activities often became known only by chance meetings or dockside gossip. The wreck of the *Sydney Cove* in the Furneaux group in 1797 and the subsequent rescue and salvage voyages made known to the wider world the existence of seal populations on the Bass Strait islands. The first recorded sealer there was Captain Bishop in the *Nautilus*, which sailed to the Furneaux Group in company with Flinders and Bass in the *Norfolk* in October 1798. Bishop returned to Sydney in December with 5,200 seal skins, leaving a party working on Cape Barren Island. Returning to the island, Bishop gathered another 9,000 skins, then sailed from Sydney with his full cargo bound for Macao.<sup>206</sup> Many other NSW and American ships (after 1803) sealed in Bass Strait. While most of their activities were associated with already known locations, Captain Reid in the *Martha* may have discovered King



Island at the western end of the strait in 1798.<sup>207</sup> The initial Bass Strait sealing boom was over by 1810, due to the decline in the seal population.

Baudin's meeting with the American sealer Captain Pendleton in the *Union*, at Two Peoples Bay, Western Australia, in February 1803, indicates the early spread of sealing along the coast, and the tenacity with which seal resources were sought. On the basis of Vancouver's description of seals on the south-west coast of Australia, and a manuscript version of the discovery of the Crozet Islands in the Southern Ocean, Pendleton had been sent to exploit these resources. He could not find the Crozets, and failed to find sufficient seals at Seal Island in King George Sound, so was making his way east when he met Baudin. On the basis of the information provided by Baudin, Pendleton made for 'Border's Island' (Baudin having renamed Kangaroo Island 'Borda Island'), and there built a 40 ton schooner, *Independent*. The *Independent* was then sent back to King George Sound to leave a message for another ship being sent out to follow up his exploratory trip.<sup>208</sup>

The *Union* and *Independent*, when reunited, then went to Sydney to refresh provisions and water. The fact that it was the off-season for sealing did not mean Pendleton rested. From Sydney:

'...both vessels, after obtaining an addition to their provisions and water, were to start in search of islands placed in some ancient charts, and said to have been discovered by Tasman, with other early navigators, thus improving the time until the sealing season in this hemisphere should return.'<sup>209</sup>

While not strictly part of this story, the subsequent history of the Pendleton expedition shows the entrepreneurial drive that sent ships to these newly or partially discovered areas, and, coincidentally, the audacity of some of the merchants of the day. Pendleton left a sealing crew on the Antipodes Islands, south of New Zealand, then returned to Sydney, where he left 12,000 seal skins from Kangaroo Island with Simeon Lord for storage, so he could take his vessel off on a sandalwood venture to Fiji. Pendleton was killed by islanders in Tonga, and the ship was wrecked in Fiji. When this news reached Simeon Lord, he sent his own ships to the Antipodes Islands to collect the 59,000 seal skins by now gathered there, then sent them to Canton and London for sale, buying Chinese goods in Canton which he shipped to the USA for sale. Lord had left the USA for Europe before the owners of the *Union* had even heard of the loss of their ship and its captain. Lord retained all the proceeds.<sup>210</sup>

The ship following in the *Union's* wake, the *Catherine*, arrived in the following season, and found Pendleton's note at Seal Island, King George Sound. On the strength of Pendleton's pessimistic assessment of the Australian sealing prospects, the *Catherine* went back into the Indian Ocean, left a party on the Prince Edward Islands, found the Crozets, and won a full cargo of skins which was then sold in Canton.

The global search for islands with seal populations, illustrated by the *Union* and *Catherine* examples, was responsible for the discovery of Macquarie Island by Captain Frederick Hasselburgh in the *Perseverance* in 1810, while seeking new sealing grounds for the Sydney company of Campbell & Co. It was also responsible for the exploitation of Heard Island, where American sealers in particular occupied the beaches, using at times Portuguese labour from the Canary Islands.



### *The whalers*

While ships of the First Fleet were licensed to whale in the Pacific in 1788, and a number of subsequent convict transports went whaling in Australian waters when they had unloaded their human cargo, it was not until 1798 that whaling in local NSW waters became established, with six British whalers visiting Sydney.<sup>211</sup> American whalers did not visit Sydney until 1805. The first known whale ship on the Western Australian Coast was the *Caroline du Sud* of Dunkirk, which whaled in the Indian Ocean and anchored in Shark Bay in December 1790. The American whalers *Asia* and *Alliance* of Nantucket also visited Shark Bay in April 1792 before cruising north towards Java.

Whale ships operating off the Australian coast suffered from the lack of accurate charts of the region. The British whalers *Kingston* and *Elligood* cruised together off the WA coast from August to December 1800, after visiting King George Sound and leaving there a copper sheet inscribed 'Aug. 27 1800. Chr. Dixon, ship *Elligood*' found by Flinders in 1801. The crews of the vessels may also have been responsible for pulling down two cairns erected by Vancouver in 1791, which could not be located by Flinders.<sup>212</sup> The *Kingston* and *Elligood* experienced considerable confusion over the location of the Trial Rocks and Dampier's Rosemary Islands, and operated with the constant tension, in the absence of accurate charts, of not knowing exactly where the Australian coastline lay.<sup>213</sup>

The impact of whaling on knowledge of the coastline increased as the number of whalers visiting the coast increased in the 19<sup>th</sup> century. Martin Gibbs, for example, has identified a major increase in American whale ships on the WA coast after 1835.<sup>214</sup> By the mid-1840s anywhere between 150 and 300 American whale ships were reported as cruising the WA coast each year, though these are likely to be somewhat exaggerated figures.

Whalers made available to local shipowners and merchants knowledge about the location of natural resources that could be exploited by the colony. Gibbs found a strong correlation between reports of American whalers successfully using particular bays, and the subsequent occupation of those bays by colonial whalers: 'The colonial authorities openly acknowledged that much of what was known about the coasts and anchorages away from the settled bays was thanks to the Americans.'<sup>215</sup> The American presence also stimulated the local whaling industry by making available whaling equipment at much lower cost than the imported equivalent, and created a market for local produce that probably allowed many small coastal settlements to survive.<sup>216</sup>

In the other colonies the pattern of bay-whaling from ships and shore-based whaling stations saw many bays in Tasmania, South Australia, Victoria and New South Wales visited or occupied for whaling purposes during the 19<sup>th</sup> century. The knowledge of the coastline and its resources both drew on, and fed into, coastal charting programs, and, as in WA, the whaling activities stimulated or supported local settlement, and assisted other industries, such as pastoralism, to become established.



## MAPPING THE COAST—OVERVIEW 1792-1822

An important development during this period was the emergence of the Admiralty chart, and its equivalents in other nations. The evolution of hydrographic survey representation through the late 18<sup>th</sup> century has already been seen in the work of Cook and Beautemps-Beaupré, and this gradual move to clearer charts with standardised symbols can be seen in the work of Flinders and Baudin. The improvement in hydrographic surveys and charts was paralleled by, and to a degree driven by, the realisation by the Royal Navy that it had to start developing its own charts and providing them to naval commanders in the interests of proper control and administration of its growing colonial obligations and international aspirations.

In 1795 Alexander Dalrymple was offered and accepted the post as Hydrographer to the British Admiralty, while still retaining his post as Hydrographer to the East India Company. The first chart produced by the Admiralty from its own surveys was published in 1801. However, Dalrymple was slow to gather, copy or develop charts for the use of naval vessels, and in 1808 the Admiralty ordered Dalrymple to supply reliable charts to its ships, and a committee was established, made up of Dalrymple and Captains Hurd, Hume Popham and Columbine, to select the most accurate charts for publication. Dalrymple continued to decline to issue charts for places which he himself had not seen, and of which he could therefore not verify the accuracy, and on the basis of illness, and obstinacy, he was dismissed from his post in May 1808. He died the following year, aged 71. Captain Hurd succeeded Dalrymple and immediately started to issue charts, and held the post of Hydrographer to the Navy until 1823. Hurd persuaded the Admiralty that the charts produced should be on sale to the wider maritime community, and that the best surveys were those conducted by the Navy's ships. Hence he was able to build up the hydrographic service as a valid career path within the Navy, and establish the body of experienced naval hydrographers on which Australia's coastal survey work was to depend.<sup>217</sup> Hurd began to impose a 'house style' for charts, and to build up portfolios of charts of particular regions, to be provided to the appropriate stations of the Royal Navy around the world. In this context, Hurd re-published Flinders' charts (originally published by the map-maker Arrowsmith), at various dates, updated with all available information that had accumulated since Flinders' surveys.

The work of Flinders coincided with the formative years of the Hydrographic Service under Dalrymple. Flinders' charts of the Australian coast, published as an atlas of 18 map sheets and coastal profiles (and 10 sheets of botanical drawings) accompanying his *Voyage to Terra Australis*, show much more detail of coastal features than do those of most of his predecessors, who depended mainly on simple running surveys. Flinders' method, like that of Beautemps-Beaupré, was based, where possible, on careful triangulation between two points ashore and the anchored ship.<sup>218</sup> His charts are more informative about his survey methods, accuracy and sources of information than earlier mapping of the coast. Innovations in his maps included:

- showing clearly the fixed points on land used in the survey
- distinguishing between those parts of the ship's track that were sailed by day, and in clear visibility, and those sailed at night or in bad weather
- distinguishing between sections of the coast charted by him and those charted by others



- distinguishing between his soundings and those taken by others
- distinguishing place names given by him and those given by others
- marking the strength and direction of tides, currents and winds he encountered.<sup>219</sup>

In Australia, King's work is the first substantial body of hydrographic charts and sailing instructions developed fully within the framework of the British Hydrographic Office's requirements, and was automatically destined for publication as Admiralty charts.

The scientific and cartographic contribution of the Baudin expedition has suffered probably the unkindest fate at the hands of posterity of any in the history of Australian exploration. To start, it was a French expedition in British waters in time of war, with all the suspicion and rivalry that entailed. In addition, Baudin was a very difficult commander of sometimes doubtful judgement, not helped towards the end of the expedition by the symptoms of his fatal disease, and he was not much loved by his staff. The publication of his journals was left after his death in the hands of Péron and Freycinet, who both loathed him. They, and particularly Péron, managed to almost expunge Baudin's name from the record, and amended most of his place names to suit current political correctness in France. In addition, they claimed French priority in the discovery of much of the southern Australian coastline, ignoring the earlier work of Flinders and Grant. Despite these problems, Baudin's map of New Holland and Terre Napoléon, published in 1811, was the first complete map of Australia, and the expedition filled in gaps of the coastal survey from Encounter Bay to Cape Northumberland, along the Tasmanian east coast, and added to the charting of the WA coast, especially in the south-west and Shark Bay.

While Flinders' attention was largely fixed on geographical discovery and the creation of accurate charts, his expeditions made major contributions to science, largely through the work of Robert Brown in botany and Ferdinand Bauer's art. Baudin's expedition had much wider scientific objectives. Its ethnographic contribution in Tasmania was substantial. Ethnographic observations and word lists of the Tasmanian Aborigines were compiled, and Aboriginal artefacts were collected; animal and plant specimens were collected, such as the now extinct Tasmanian and King Island emus, and Leschenault's collection of plants, including many new to science. And all was documented in sketches and drawings.<sup>220</sup> Flinders was certainly the better hydrographer of the two, but some of Baudin's detailed coastal work was often more accurate than Flinders'. Ironically, Flinders' scientific work was probably more influential at the time because it was made accessible well before Baudin's. While the initial Baudin journal came out before Flinders' work, many parts of the huge Baudin collection, which numbered over 200 000 items, were not made generally accessible until the 1870s and 80s. His collection included 3 872 species in zoology (2 542 thought to be new species) and 1 500 in botany (640 thought to be new species).<sup>221</sup> The entire collection of 206 Aboriginal artefacts was given by Péron to the Empress Josephine, and lost when sold at auction in 1829.

By contrast, Robert Brown wrote his descriptions of his collection of 3 600 botanical specimens while still at sea, and Bauer had made 1 500 sketches of them. Brown's *Prodromus florae Novae Hollandiae* was published in 1810, with over 2 000 species described, 75 per cent of them new to science, and while the second volume never



appeared due to cost, the entire collection was made available for study at the British Museum. The great botanist and director of Kew Gardens, Sir Joseph Hooker, described Brown's work as 'the greatest botanical work that has ever appeared'.<sup>222</sup>

P.P. King's surveys resulted in eight coastal sheets and ten plans of harbours and gulfs, published in 1825. Several were still in use in the middle of the 20<sup>th</sup> century. His work was very much in the by then standardised style of the Admiralty hydrographic chart, wherein many of Flinders' innovations had become the norm for naval hydrographers. King's active advocacy for the inner route to Torres Strait reflected the changing nature of the purposes of the hydrographic survey. While Flinders was an Englishman completing or refining the exploratory work of Cook in distant lands, King, while still very much an Englishman and naval officer, was also an Australian producing working documents for domestic mariners. His father before him had advocated the use of Torres Strait, and King thought of his work in this sector of the coast, at least, as extending not just the colony's geographic description, but also reinforcing its economic viability.

King's work completed what Flinders had begun—the general survey of the Australian coastline sufficient for relatively safe navigation. Flinders and Bass proved Tasmania was an island; King proved Australia was a continent, not an archipelago of huge islands. The later Admiralty hydrographers were to refine the definition and detail, but King and Flinders were the pioneers, doing most of their work in waters hitherto untouched or only vaguely seen by earlier European mariners.

Another source of knowledge about the coast was the whaling and sealing industry, which often preceded the work of the explorers and surveyors.

Places that stand out as potentially significant in this period are:

- the wreck site of the *Sydney Cove* on Preservation Island, Bass Strait, because of the stimulus it provided for exploration and survey of Bass Strait
- King George Sound—a place associated with many of the exploration and survey expeditions, and events in later phases (see chapter 6)
- Middle Island in the Recherche Archipelago, associated with a number of the early surveys, as one of the largest and most recognisable islands of the dangerous archipelago
- Memory Cove, near Port Lincoln, closely associated with Flinders' expedition through the loss of eight men, and associated with relics of Flinders' trip
- Sweers Island, as an important link between the Dutch and Flinders' surveys, and as a site of subsequent importance in the settlement of the Gulf of Carpentaria
- Encounter Bay, the meeting point of Flinders and Baudin, and central to the dispute over national priority in exploring the south coast
- Two Peoples Bay, where Baudin met the sealer Pendleton, indicating the 'secret' knowledge of the coast held by the sealing and whaling industries
- Malay Road, Northern Territory, where Flinders gathered information about the Macassan trepanging industry on the north coast
- Inscription Point, Dirk Hartog Island, already highlighted for earlier associations, continues to be an important point on the Australian coast, with associations with most of the explorers and surveyors of the era



- South Goulburn Island, King's regular watering point, illustrating the importance of knowledge of resources to the surveyors, and site of conflict with Aboriginal people
- Intercourse Islands, Dampier Archipelago, symbolic of all-too-rare friendly contact between surveyors and Aboriginal people
- Careening Bay, Port Nelson, Brunswick Bay, an important point in King's expeditions, and site of one of the most spectacular relics of the era, a large carved boab tree.



# 6

## FILLING IN THE GAPS AND IMPROVING THE DETAILS

### THE ESTABLISHMENT OF EUROPEAN SETTLEMENTS

A major factor in the increasing demand for detailed navigation charts during the early 19<sup>th</sup> century was the spread of settlement. Each new settlement increased the amount of naval and merchant shipping using sea routes to access it, and maritime safety became an increasing concern of the colonial and imperial governments. The spread of settlement can be seen in Table 3 on page 107.

These settlements were all based on the expansion of knowledge of the coastal geography resulting from the combined work of the hydrographic surveyors and the land explorers and surveyors. The location of settlements was influenced by a variety of factors.

*The settlement at Port Essington on the northern coast of Australia, from a watercolour by Edwin Augustus Porcher painted in June 1845. Port Essington was discovered by King in 1818.*  
National Library of Australia







*1893 gun emplacement in the fortifications at Albany.*

Department of the Environment and Heritage

The discovery of resources was a primary factor—coal deposits in the case of Newcastle, pastoral and agricultural land in the case of many coastal settlements such as Port Curtis, Adelaide, Melbourne, Fremantle and the later 19<sup>th</sup> century settlement of the Gulf of Carpentaria ('Plains of Promise', Burketown, Sweers Island and Normanton) and Camden Harbour and other pastoral ports in north-west WA. The leap-frogging of settlements along the coasts from the earliest established port was usually related to the rivers and anchorages that gave access to the fertile valleys and hinterlands. The discovery of these locations and their resources was sometimes made by maritime survey, and sometimes by land exploration.

The strategic positioning of settlements on trade routes was a primary consideration in a number of instances, as in the case of the Northern Territory settlements (Fort Dundas, Fort Wellington, and Port Essington), Albany, and the later 19<sup>th</sup> century settlements at Somerset on Cape York and on Thursday Island. For example, at Albany Vancouver had discovered one of the world's finest natural harbours in 1791 and named it King George Sound. It was here that he claimed the southern part of Western Australia for the British Crown. During the 19<sup>th</sup> century, the potential threat to the security of the sea route from the east coast to the Colony of Western Australia as a result of the loss of this strategic port to an enemy naval squadron was recognised. As a result, all of the Australian colonies agreed to proportionally pay for the construction of a fort at Princess Royal Harbour on King George Sound, while the Imperial British Government agreed to supply the guns. The fort was opened in 1893, and called the Princess Royal Fortress.

Political strategic imperatives influenced the settlement of Norfolk Island, Launceston and Hobart, in denying the regions to foreign claims. Other strategic considerations



(mainly the separation from expanding free settlement areas) influenced the location of convict establishments such as Port Macquarie, Port Arthur, Moreton Bay and the second settlement of Norfolk Island.

The sustenance of the new settlements demanded adequate knowledge of the best routes and hazards to avoid in the sea-routes linking them to Sydney and the outside world. Hence much of the work of the hydrographic surveyors was focused on the charting of anchorages, harbours and sea-lanes associated with the expanding network of Australian settlements.

**TABLE 3. SETTLEMENTS AROUND THE AUSTRALIAN COAST DURING THE EXPLORATION AND EARLY MARITIME SURVEY PERIOD**

Year	Settlement	Detail
1788	Port Jackson	First Fleet convict settlement
1788	Norfolk Island	Convict settlement immediately after Port Jackson
1801	Newcastle, NSW	Convict settlement on the Hunter River
1803, Sept	Risden Cove, Tasmania	<i>Lady Nelson</i> (Lieut. Curtoys) and the <i>Albion</i> (a whale ship, Capt. Eber Bunker) under the command of Lieut. John Bowen established a convict camp at Risden Cove on the Derwent River
1803	Sullivans Bay, Sorrento, Port Phillip	Settlement by David Collins in the <i>Calcutta</i> and <i>Ocean</i> . In February 1804 the <i>Lady Nelson</i> assisted the <i>Ocean</i> evacuated the 455 settlers and carried them instead to the Derwent River (Sullivans Cove, Hobart)
1804, Nov	Port Dalrymple (Launceston), Tasmania	The <i>Lady Nelson</i> , in concert with the HMS <i>Buffalo</i> , <i>Francis</i> and <i>Integrity</i> , carried a party under Col. Paterson to establish a settlement at Port Dalrymple
1819, May	Port Macquarie, NSW	The <i>Lady Nelson</i> (Capt. Brown) and the <i>Mermaid</i> (P.P. King), together with the <i>Prince Regent</i> , sailed to Port Macquarie carrying settlers and convicts to establish a new settlement there
1824, Sept	Fort Dundas, Apsley Strait, Melville Island, NT	The HMS <i>Tamar</i> (Capt. J.J.G. Bremer), <i>Lady Nelson</i> and the transport <i>Countess of Harcourt</i> founded a settlement on the north coast of Australia. Fort Dundas was abandoned in March 1829, its remaining stores and animals being sent to Fort Wellington
1824, Sept	Moreton Bay, Queensland	Convict settlement established at Redcliffe, shortly moved to Brisbane
1827, Feb	Albany, WA	Penal settlement established by Maj. Edmund Lockyer. Convict establishment removed 1831
1827, June	Fort Wellington, Raffles Bay, Coburg Peninsula, NT	Established by Capt. Stirling in HMS <i>Success</i> and three transports. Settlement abandoned in August 1829
1829, May	Fremantle, WA	Established by Capt Stirling, and WA formally claimed for Britain
1836, Dec	Adelaide, SA	Established by Capt. John Hindmarsh and Col. William Light as a free-settler colony
1836	Melbourne, Victoria	Established as a private settlement by John Batman, then accepted as a townsite in 1837
1838, Nov	Victoria, Port Essington, Coburg Peninsula, NT	Established by Capt. Bremer in HMS <i>Alligator</i> , HMS <i>Britomart</i> , barque <i>Orontes</i> and schooner <i>Essington</i> . Abandoned 1849
1847, Jan	Port Curtis, Queensland	Aborted settlement at Port Curtis established by Col. George Barney. 200 convicts and free settlers removed April 1847



## THE ROYAL NAVY HYDROGRAPHERS—1823 TO 1860

After the departure of King in 1823, there was no ship employed in Australian waters on special survey work until the arrival of Commander John Clements Wickham in HM Sloop *Beagle* in 1837. However, a number of Royal Navy vessels had undertaken minor surveys of channels and port entries, including:

- HMS *Rainbow* (Capt. Rous) at Port Stephens in 1828
- HM Sloop *Satellite* (Com. Currie) in 1822-1823
- HMS *Tamar* (Capt. Bremer) at Melville and Bathurst Island in 1824
- HMS *Crocodile* (Capt. Montague) at Jervis Bay in 1830
- HMS *Rattlesnake* (Capt. Hobson) which surveyed Port Phillip in 1836
- HM Brig *Britomart* (Lieut. Owen Stanley) at Coburg Peninsula in 1839<sup>223</sup>

### ***J.C. Wickham and J.L. Stokes—1837-1843***

The *Beagle* first visited Sydney and Hobart under the command of Captain Robert Fitzroy in 1836, with Charles Darwin aboard as scientist, and carried out a survey of the Cocos (Keeling) Islands. With Commander John Clements Wickham in command, the *Beagle* returned to Australia in November 1837, to fill in the gaps left by King, especially in north-west Australia, and to make a thorough examination of the principal sea-gateways to eastern Australia, Torres Strait and Bass Strait.<sup>224</sup>

From January to May 1838, the *Beagle* sailed north from the Swan River to survey Roebuck Bay, Beagle Bay, King Sound and, in a boat trip taken by Lieutenant John Lort Stokes, the Fitzroy River at its head. Collier Bay and the coast and inlets between it and Brunswick Bay were similarly surveyed from a boat by Stokes, while Wickham surveyed Brunswick Bay and the Regent River area. While there, he visited the schooner *Lynher*, moored at Hanover Bay as the base for the land explorations of Sir George Grey. After refreshing supplies in Sydney, the *Beagle* went to Bass Strait and surveyed the Kent group of islands and the western strait.

During the 1839 survey, the area of Van Diemens Gulf and Clarence Strait were closely surveyed, the Adelaide and Victoria Rivers discovered and charted, and Port Darwin (named by Stokes after his not-yet-famous former *Beagle* colleague Charles Darwin) and Bynoe Harbour found and surveyed (see a section of the chart opposite).

In 1840 surveys were carried out on the west coast, King George Sound and Bass Strait. The Houtman Abrolhos ('Houtman Rocks') and Champion Bay were surveyed in detail but Wickham failed to find the position of Turtle Dove Reef, reported on the Dutch maps. The coast near Depuch Island and Delambre Island, and the Montebello Islands, were visited to look for the Trial Rocks and Ritchies Reef, without success. At Depuch Island, first charted by Baudin in 1801, Wickham and Stokes found a series of galleries of Aboriginal rock art which greatly impressed them. Wickham submitted 94 sketches to the hydrographer, Beaufort, who had them published in the *Journal of the Royal Geographic Society* in 1841. These art sites, together with those found and published by the explorer George Grey, added substantially to contemporary knowledge of Aboriginal art, and changed perceptions of Aboriginal culture. It has been claimed that engravings were still being made at Depuch Island up to the early 20<sup>th</sup> century.<sup>225</sup>





Chart of the Victoria River, Northern Territory. From "Chart of the North - West Coast of Australia. Sheet V" by Phillip Parker King, published by the Hydrographical Office of the Admiralty, London, 1866. National Library of Australia

Wickham's able hydrographer, Lieutenant John Lort Stokes, who had served in the *Beagle* since 1824, succeeded Wickham as commander of the *Beagle* in March 1841, and, promoted to the rank of Commander, continued the survey program. It was a sign of the seriousness with which the hydrographic work of the Navy was now taken, that Stokes was probably the only officer to have advanced through the ranks from Midshipman to Commander in the one ship.



In 1841 Stokes took the *Beagle* to Torres Strait and the Gulf of Carpentaria, where he discovered the Flinders and Albert rivers. His chart of the southern part of the Gulf of Carpentaria remained in use for over 100 years. The 1842 season was spent re-surveying Bass Strait.

### ***Francis Blackwood in HMS Fly—1842-1845***

Captain Francis Blackwood was given the task of a detailed survey of the Great Barrier Reef and Torres Strait, which he pursued between 1842 and 1845. On board the corvette *HMS Fly* were geologist J.B. Jukes, and zoologist John MacGillivray, Jukes later writing a popular account of his experiences.<sup>226</sup> Lieutenant Charles Yule in the cutter *Bramble* accompanied the *Fly*. Blackwood's survey extended north from Sandy Cape, incorporating the Capricorn Islands and Swain Reefs, Whitsunday Passage, 800 km of the outer Barrier Reef, Endeavour Strait and the eastern part of Torres Strait from Cape York to the New Guinea coast, and 160 km of that coast.<sup>227</sup>

The emphasis had changed from one of exploration and discovery to one of detailed survey for shipping purposes. Blackwood surveyed a new route

*bottom: Australia, Raines Islet on the Great Barrier Reef. Watercolour by Edwin Augustus Porcher drawn on 12 September 1844.*

National Library of Australia

*below: The Raine Island beacon as it appears today, little changed from when Porcher drew it in 1844.*

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through Torres Strait from Bramble Cay to Endeavour Strait, which is now known as the Great North East Channel. The most lasting physical symbol of Blackwood's work is another marker of a shipping route, the stone beacon tower on Raine Island, built by 20 convict artificers under the supervision of the *Fly's* First Lieutenant J.M.R. Ince in 1844. The 19.5 m high beacon marked a relatively safe passage through the outer Great Barrier Reef.

### ***Owen Stanley in HMS Rattlesnake—1847-1850***

In 1847 the frigate HMS *Rattlesnake* was deployed as a survey vessel to carry on the survey of Australia's northern coasts and nearby islands. Between 1846 and 1850 the ship was under the command of Captain Owen Stanley, carrying out surveys of the Torres Strait, the Louisiade Archipelago and eastern New Guinea, extending earlier work of Blackwood and Yule. The *Bramble*, with Yule still in command, became the *Rattlesnake's* tender. Stanley had previously helped establish the settlement at Port Essington and surveyed the northern coast as Captain of HMS *Britomart* between 1837 and 1843.<sup>228</sup>

Stanley's role was primarily to focus on the definition of new shipping routes and the safety of existing ones, especially with the increasing demands of steamship navigation. He undertook surveys of Twofold Bay, Botany Bay and the approaches to Port Jackson and Moreton Bay, and a survey of the Queensland coast, with anchorages adjacent to the inner route. In Torres Strait he examined eight channels, of which five were not previously known.

Notable members of the *Rattlesnake's* company included the assistant surgeon T.H. Huxley, the biologist and later influential supporter of Darwinism, the artist Oswald Brierly, and zoologist John MacGillivray, formerly of the *Fly*.

In October 1849 the *Rattlesnake* stopped at Evans Bay on Cape York to get water, and it was there that the watering party found Mrs Barbara Thompson. She and her husband had been wrecked in their small cutter, *America*, on a reef off Possession Island at the entrance to Endeavour Strait about five years before, and Mrs Thompson had been the only survivor. She had been saved from drowning by the local Torres Strait Islanders, had been taken as a wife by one Boroto, and had been absorbed into the Murrulug tribe. She had initial difficulty communicating in English, but was carried south by the *Rattlesnake* on the completion of the survey work, and was reunited with her family in Sydney.

Stanley died in Sydney in 1850, and Yule succeeded him as commander of the *Rattlesnake*, but no further major survey work was concluded before the ship sailed for Britain. Yule was promoted Commander in 1855, and succeeded Commander Burwood as editor of the *Australia Directory*, the predecessor of the current *Australia Pilot*. Such Sailing Directions had been introduced by the British Hydrographic Office between 1823 and 1829 to augment the information on Admiralty charts. From 1833 *Notices to mariners* were also produced, which provided updated information of changes to charts.

### ***Henry Mangles Denham in HMS Herald—1853-1861***

When HMS *Herald* came to Australia under the command of Captain Henry Mangles Denham in 1853, the ship already had a long and distinguished career as a



hydrographic survey vessel, in Captain Kellett's six-year survey of the North Pacific. Denham also had distinguished himself in the survey of the Bristol Channel, Welsh coast and Mersey River approaches to Liverpool, and of the Bight of Benin in West Africa. The *Herald* arrived in company with the 300 ton iron paddle steamer HMS *Torch*, which was to act as the *Herald's* tender.<sup>229</sup>

Because of increased traffic across the Pacific following the California and Australia gold rushes, and the increased activities of church missions among the Pacific islands, the Admiralty was lobbied and agreed to carry out more detailed surveys of the south-west Pacific, in order to more accurately fix the positions of the major islands, and to improve the charts for safe navigation around those islands. Denham's tasks were also to include the survey of remaining problem areas on the Australian coast.

Denham carried out surveys in Bass Strait, Shark Bay, Lord Howe Island, Sydney Harbour, King George Sound, the Great Barrier Reef, and the outer route through the Coral Sea, as well as in Fiji, the New Hebrides and New Caledonia. The survey of Norfolk Island replaced that of William Bradley made in 1790. The Great Barrier Reef surveys included the delineation of the limits of the anchorages on the outer Barrier Reef in the Coral Sea, a particularly hazardous survey. The shipping lane surveyed through the Coral Sea from southern Queensland waters to the Raine Island Passage was named Denham's Route by merchants in Sydney. In nine years Denham completed 200 sheets of charts, plans and drawings. His work in making the shipping routes safer included not just charting existing dangers, but excluding by survey reported but fictitious shoals and rocks.

## ROYAL NAVY HYDROGRAPHIC OFFICE SURVEYS —1860 TO 1920

The Hydrographer to the Admiralty, Sir Francis Beaufort, retired in 1855, and his successor, Captain John Washington ordered Denham to negotiate with the governments of the Australian colonies to modernise the colonial charts. Denham got the agreement of the NSW, Victorian, Tasmania, South Australian and Queensland governments to share the cost of surveying their shores and harbours, though WA declined and Queensland and Tasmania withdrew from the agreement before the work was completed because of the costs that would be entailed for their coasts. Each colony provided a vessel for the surveyors, who were Royal Navy officers.

The work in the various colonies was completed or abandoned by 1880, and the Admiralty again began assigning survey vessels from the Royal Navy's Australia Station, on a cost-sharing basis with the colonies. The work concentrated on the more isolated regions of northern Australia, and the Tasmanian coast. In 1881 HMS *Lark* and HMS *Alert* were employed in Queensland and New Guinea waters. In 1883 HMS *Dart* commenced survey work which saw her employed from Tasmania to the Great Barrier Reef and the Pacific over the next 20 years. The *Dart* had some distinguished commanders, including three future Hydrographers of the Royal Navy, A.M. Field, C. Purey-Cust, and J.F. Parry, Hydrographer during WWI and grandson of W.E. Parry the Arctic explorer, Hydrographer and Commissioner of the Australian Agricultural Company. She operated in concert with HMS *Alert*, HMS *Lark* and



Queensland Colonial gunboat *Paluma*. The screw-sloop HMS *Penguin* arrived in Australia in 1890 and was engaged in colonial survey for the next 16 years.

From 1907 HMS *Fantome*, joined from 1910 by HMS *Sealark*, was engaged in survey work in Western Australia and Tasmania up until WWI, ending survey work in 1914.

## THE ROYAL AUSTRALIAN NAVY HYDROGRAPHIC SERVICE —1920–2000

The Royal Australian Navy took over control of the Admiralty Chart and Chronometer Depot in Sydney in 1913. HMS *Fantome* was used by the RAN for general service duties from 1914 until 1919. The ship reverted to the surveying role on 1 July, 1920. In that year the Admiralty indicated that they were no longer able to be responsible for hydrographical survey in Australian waters. Their involvement continued on a cost-sharing basis, however, for some years, HMS *Fantome* resuming survey duty until 1924, being replaced by HMS *Herald* which surveyed in Torres Strait until 1926.

The Royal Australian Navy Hydrographic Service was formed on 1 October 1920, with Captain John Robins as the RAN Hydrographer. No RAN officers were qualified in hydrographic survey, so in 1922 officers were sent to Britain for training.<sup>230</sup>

HMAS *Geranium* was commissioned for survey duties in 1920, and undertook harbour and anchorage surveys until commencing the survey of Cumberland Channel in the Great Barrier Reef in 1925, remaining on the Barrier Reef until her retirement in 1927. The *Geranium* was joined in 1925 by HMAS *Moresby*, on loan from the Admiralty. The *Moresby* conducted the first accurate triangulation of the Great Barrier Reef, positioning reef features in relation to the mainland.<sup>231</sup> However, the Hydrographic Service was squeezed by the lack of funds during the Depression, and the *Moresby* was laid up from 1930 to 1933. On recommencement of services, urgent strategic surveys were undertaken during the tense period leading up to WWII.<sup>232</sup>

At the outbreak of war the Hydrographic Service operations were again put on hold, and survey work was not recommenced until 1941. In 1942 the Hydrographic Service was given responsibility for publication of all Australian charts as well as the survey work, and commenced intensive work to rectify the paucity of reliable charts in Australia's northern waters and the adjacent theatres of war in New Guinea, the Solomons and the south-west Pacific. This work included survey, under enemy fire, of anchorages; the preparation of areas for invasion in the Philippines; pilotage of invasion forces through dangerous waters; and the improvement of Admiralty charts for the region.<sup>233</sup> By the end of the war 16 survey ships were in commission on this dangerous work.

After the war a 25-year program of surveys was commenced to update the Admiralty chart coverage of Australian areas of interest, including Papua New Guinea, the Solomon Islands and the Coral Sea, but foundered after just three years due to funding constraints. The program was resumed in 1952 with the ships HMAS *Barcoo* and *Warrego*. They were joined in 1959 by HMAS *Gascoyne* and *Diamantina* (the latter surviving as a museum ship in Brisbane).<sup>234</sup>



During the 1960s and 70s deeper draught ships began servicing the mineral and general cargo export industries, and the need for highly accurate survey of the shallower approaches to Australian ports became a priority. A new HMAS *Moresby*, Australia's first purpose-built survey ship, was commissioned in 1964, and was joined by the survey ship HMAS *Flinders* in 1973. These remained in commission until 1997 and 1998 respectively.

The current hydrographic fleet consists of HMAS ships *Leeuwin*, *Melville*, *Paluma*, *Mermaid*, *Shepparton*, and *Benalla*.<sup>235</sup>

The technology of hydrographic survey changed fundamentally during the course of the 20<sup>th</sup> century. In 1922, the *Geranium* became the first vessel to use an aircraft for hydrographic survey operations, foreshadowing the increasing use of aerial survey later in the century.<sup>236</sup> Various methods of acoustic sounding for depth were developed from 1926, with shallow water echo sounders trialled in 1932, and deep-water echo sounders soon following. ASDIC, later known as SONAR, developed during WWI and improved during WWII as a submarine detection system was adapted to scan for obstructions between lines of sounding points, and as a safeguard for testing for hazards ahead of survey ships in uncharted waters. Radar was adapted for measuring distances, and from the late 1960s the first use of satellite positioning became available to hydrographic vessels, with the Transit Satellite System (also known as the Navy Navigation Satellite System (NNSS)), which was replaced in the 1990s by the Navigation System by Time and Ranging (NAVSTAR) Global Positioning System (GPS), and the more refined Differential GPS.<sup>237</sup>

The advent of laser technology led the Hydrographic Service to ask the Weapons Research Establishment to investigate the development of laser instruments for survey work. The result was the first prototype of the Laser Airborne Depth Sounder System (LADS) which was developed and tested through the 1970s and 80s. BHP Engineering commenced detailed design for the trial and building of the final version in 1989, and the operational LADS was adopted by the RAN Hydrographic Service in 1993. The system has been upgraded over time, and can survey at up to 10-20 times the rate of conventional surface vessels, to depths of up to 70 metres. By 1999 at least 50 per cent of the survey work was done by LADS installed in a Fokker F27-500 aircraft. It was estimated that the then 100 survey-year backlog facing the Hydrographic Service if using conventional ship-borne systems would be reduced to 15 years using LADS.<sup>238</sup>

Another late 20<sup>th</sup> century development has been the Electronic Chart Display and Information System (ECDIS), which provides hydrographic information to ships in electronic form. ECDIS combines electronic chart information with satellite positioning, constantly updated and available on the bridge of a vessel.<sup>239</sup>

An example of the more recent role of the Hydrographic Service was the survey of deep-draught shipping routes through Torres Strait in 1971. Another was the discovery and charting in 1981-1983 of the Hydrographers Passage, a new 130 km deep-draught passage through the outer Great Barrier Reef east of Mackay. Following completion of the hydrographic work and beaconing of the passage, Hydrographers Passage enables large coal carrying ships loading in central Queensland ports to have close and safe access to the Coral Sea, cutting 800 km off the round voyage to Japan.<sup>240</sup>



Advances in technology have also enabled dramatic improvement of knowledge of the continental shelf in recent decades. The CSIRO has conducted extensive research on the habitat of the continental shelf and has mapped sections in great detail, work of importance from both an environmental and commercial (fisheries, minerals) perspective. Geosciences Australia, through the Australian Antarctic and Southern Ocean Profiling Project (AASOPP), is undertaking intensive study of the seabed between Australia and Antarctica. Increased knowledge of the bathymetry, seabed characteristics and geology of the Southern Ocean adjacent to the Australian Antarctic Territory (AAT) is targeted at defining the outer limit of the AAT continental shelf, to support a potential case for Australia's marine jurisdiction offshore from the Australian Antarctic Territory, and to provide information in support of regional marine planning and environmental management under Australia's Oceans Policy.<sup>241</sup>

## **SURVEY AND COMMERCE—SHIPPING ROUTES, NAVIGATION AIDS AND DEFENCE**

### ***Settlement and sea routes***

As indicated in the earlier discussion of the spread of European settlement, each new settlement increased the number of naval and merchant ships using sea routes, and maritime safety became an increasing concern of the colonial and imperial governments. Settlement location was based on information provided in the first instance by the coastal surveys, and when settlements were established additional surveys were required to provide a more detailed knowledge of the local anchorages, harbours and approaches, and of the sea-lanes leading to each settlement.

The early settlements in Tasmania, the tentative settlements in the Northern Territory, and the two settlements on the south-west coast of Western Australia emphasised the nature and scale of the problem facing the hydrographic survey process—isolated settlements separated by immensely long and in many cases highly hazardous coastal sea routes linking them to Sydney and to the overseas shipping routes. The gradual establishment of coastal towns and ports along the NSW, Queensland, Victorian and South Australian coasts added to the demands for survey, with demands intensifying whenever a ship was grounded or wrecked, which was an all-too-frequent occurrence.

The process of settlement driving survey priorities did not end with the first flourish of expansion in the early 19<sup>th</sup> century. An example is the settlement of the north-west of Western Australia. The demands of pastoralism, gold rushes and pearling for port access led to the establishment of a string of towns along the coast from the 1860s to the 1880s—Roeburne 1866; Cossack 1871; Port Hedland 1870s; Carnarvon 1876–1883; Broome 1883; Derby 1883; Onslow 1885; and Wyndham 1886. The north-west towns were unique in that they became part of a standard trade route network that linked south-east Asia with Australia in the late 19<sup>th</sup> century. International and Australian steamship companies ran regular services that operated between Singapore and Perth, stopping at the north-west towns en route. Until the advent of air services in the mid-20<sup>th</sup> century, shipping provided the only source of supplies and social contact available to the north-west towns.<sup>242</sup>

The establishment of iron-ore towns in the north-west, ports and routes to export the coal resources of central Queensland, and the oil and gas fields in the Bass Strait and



on the North-West Shelf are examples of major developments in the 20<sup>th</sup> century that required new surveying campaigns. In addition to these new needs, the condition of the sea floor, harbour mouths and the geography of the coast is not static, so ongoing survey work is necessary to ensure that the knowledge depicted on charts remains accurate. Changing technology has allowed for ever-increasing refinement in survey accuracy, and a reduction in the time required to undertake these surveys.

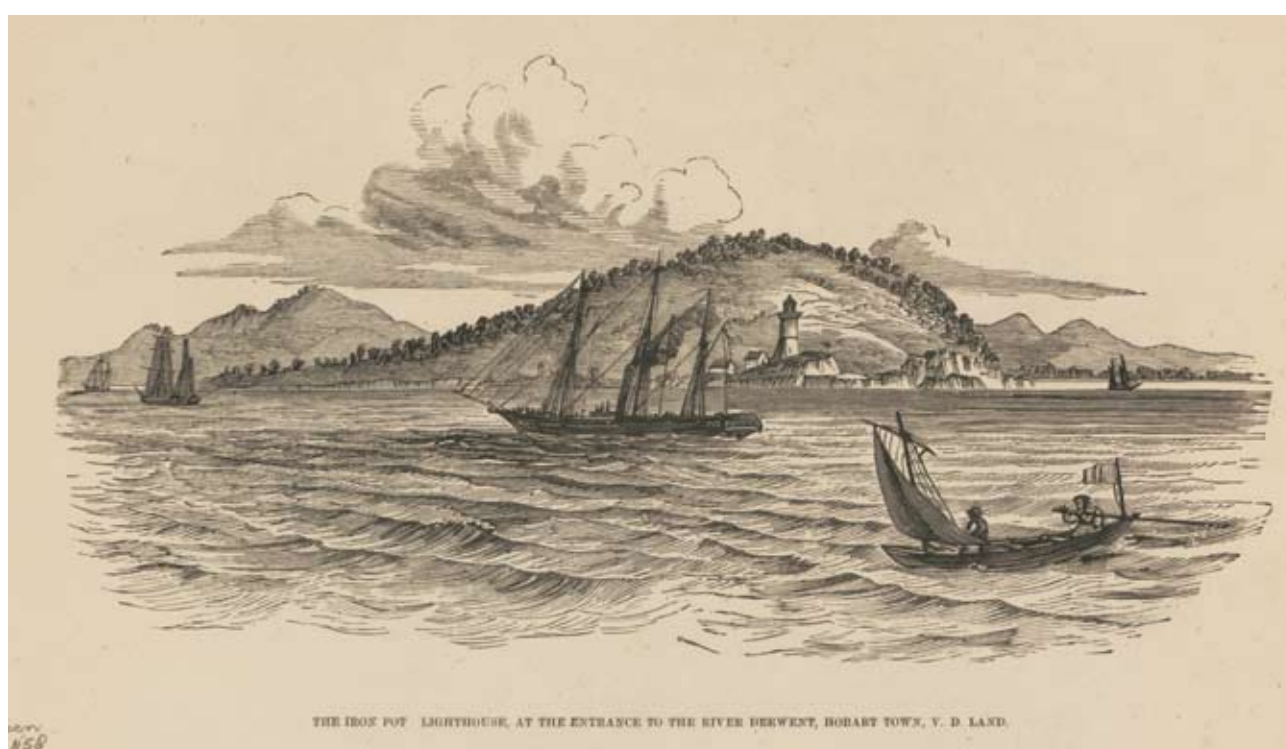
The examples of the detailed survey of the Great Barrier Reef and Torres Strait, outlined in previous sections, highlight the ongoing need for new and more refined hydrographic information. Safe passages for deep-draught ships, definition of continental edges to support national control of fisheries and seabed resources, and detailed knowledge of those resources to plan and control future conservation and exploitation, are examples of the needs driving survey activity. This trend for targeted information has not finished, nor is it likely to—as new needs arise, new surveys are required to support it.

### ***Safety at sea—the provision of navigation aids***

From the time of the earliest European exploration of the Australian shore it was clear that this was a dangerous place. The many Dutch shipwrecks brought this starkly to the attention of the VOC, and the stranding of the *Endeavour* on Endeavour Reef reinforced it for Cook. The instructions to the naval hydrographers included the direction to identify and clearly chart hazards, and they were gradually marked by the erection of beacons and lighthouses. Explorers noted major landmarks that warned of off-shore hazards, such as Cook's Mt Warning, and later surveyors directly marked threats—Blackwood built the beacon on Raine Island to mark the passage through the Barrier Reef (see images of Raine Island on page 110), and Denham planted low-lying islets with coconut palms to make them more visible from sea.

*The Iron Pot lighthouse at the entrance to the Derwent River, Hobart Town, V.D. Land. From an engraving on wood by J R Clarke, Sydney, 1857.*

National Library of Australia



THE IRON POT LIGHTHOUSE, AT THE ENTRANCE TO THE RIVER DERWENT, HOBART TOWN, V. D. LAND.



With a coastline of over 19,000 km, the decision about where to place lighthouses and other navigation aids on the Australian coast was a difficult one.<sup>243</sup> The first generation of lights protected the approaches to the main settlements. A coal-burning beacon was erected at the entrance to the Hunter River at Newcastle in 1804. The first lighthouse, understandably, was erected on South Head of Port Jackson in 1817 to mark that dangerous entry. This, the Macquarie Light, was replaced with the current tower in 1883. Lights were provided at the Iron Pot in Storm Bay (see illustration, left) at the Derwent River entrance in 1832 and at Low Head at the entrance to the Tamar River in Tasmania in 1833. A light at Cape Bruny followed in 1838. Lighthouses were built on a number of Bass Strait islands and on the Victorian coast between the 1840s and 1860s.

The elegant stone lighthouse tower erected by Benjamin Boyd at Twofold Bay in 1847 to guide his own ships into port was a beacon that may have been lit on no more than three occasions, before the government intervened to prevent the use of a navigation aid which it could not guarantee would be lit every night.

The entrance to the South Australian gulfs was marked by the lights at Cape Willoughby on Kangaroo Island in 1852 and at Troughbridge Shoal on the western side of St Vincent Gulf in 1856. The entrance to Fremantle in WA was marked by the light on Rottnest Island in 1851, and to King George Sound at Breaksea Island in 1858. The approaches to Brisbane and the associated hazards were marked by the Cape Moreton lighthouse in 1857.

In north Queensland new ports were established at Mackay in 1860 and Bowen and Townsville in 1864, and awareness grew of the need for increased maritime safety. In response to an inquiry in 1864, a beacon with lantern was erected on Lady Elliott Island in 1866 (replaced by a lighthouse in 1873), and a lighthouse was completed at Bustard Head in 1868, and at Sandy Cape in 1870. Cape Capricorn lighthouse followed in 1874.

Because navigation of the Great Barrier Reef and Torres Strait was an issue that concerned all colonies, being on the main trade route to eastern Asia, an inter-colonial conference in 1873 recommended more lights be erected along the inner route and through Torres Strait. A lighthouse was erected on North Reef, marking the Capricorn Channel, in 1878, and on Low Isles off Port Douglas in the same year. Other lights followed over the next decade. However the lighting of Torres Strait was tardier. A light was completed on Goods Island in 1887 to mark the entrance to the Prince of Wales Channel and Normanby Sound, and on Booby Island in 1890 to mark the western end of the straits route.

Western Australia, being a poor state before the discovery of gold in the 1890s, and with an immense coastline, had no major lights outside the south-west until the 20<sup>th</sup> century.

At Federation, the Commonwealth assumed responsibility for off-shore navigation aids, but had little money to do anything about it. However, in 1908 the Commonwealth offered to reimburse the states for any lighthouses they now built, and Western Australia built seven new lighthouses between 1910 and 1914.<sup>244</sup> The Commonwealth finally resumed the state lighthouses, and established the Commonwealth Lighthouse Service in September 1913. It immediately started building lighthouses in the major shipping lanes, at Citadel Island and Cape Liptrap in Bass Strait in 1913, and Cape



Don on Coburg Peninsula in 1915. In 1915 the Commonwealth took responsibility for 104 manned lights, and assorted other navigation aids. Between 1914 and 1939 the Commonwealth built more than 60 lights, including a number on the previously unlit northern coast, and additional lights in Torres Strait and the Great Barrier Reef.

### ***The protection of the sea routes***

Initially, the Australian colonies felt comfortable under the protective shield of the British Army and Royal Navy contingents. However, as the colonies developed their own economies, and as the demands of the empire changed, Britain began to demand joint funding of defence, then withdrew land forces altogether in 1870, and cut back on its naval presence. In response, the colonies started to build their own tiny navies. The protection of the major coaling stations located on the distant shipping routes at Thursday Island in Torres Strait and at Albany in King George Sound was a defence issue that concerned all colonies, and in 1890 they agreed to co-fund defensive fortifications at these places. Britain offered to provide the ordnance to arm them.<sup>245</sup>

The Queensland government had already tried to address the issue of Torres Strait security with the establishment of a settlement at Somerset on Cape York in 1863, to act as a coaling station, refuge for mariners, police station, and garrison port for 25 marines. Run by John Jardine, and a number of successors as police magistrate, the settlement's location was not the best, due to the tide race through Albany Strait, on which it stood, and in 1877 the settlement was moved to Thursday Island, which was also closer to the shipping routes. Thursday Island had been annexed by Queensland in 1872, and Queensland pushed its northern boundary to include the rest of the Torres Strait Islands in 1879.<sup>246</sup>

The Green Hill Fort on Thursday Island, and Princess Royal Fort at Albany, were both completed in 1893.

## **MAPPING THE COAST—OVERVIEW AFTER 1823**

During this phase of the survey of the coastline, the opportunities for the exploration of new land had been reduced to the small-scale detail of coastal gulfs, island groups and river estuaries. The pressure for surveys to provide information on coastal detail, shipping routes and hazards to support the shipping needs of the expanding settlement of the continent had become paramount. Nonetheless, knowledge of these details, particularly on the north-west coast, continued to provide new insights into the nature of the continent.

Increasingly, surveys concentrated on those areas most dangerous for shipping—Torres Strait, the Great Barrier Reef, and Bass Strait—and this emphasis continued after Australia took direct control of its hydrographic work. As ships became larger and resource and territorial imperatives extended to the continental shelf edge, new demands for hydrographic survey arose, supported by dramatic changes in seabed and oceanographic mapping technology in the 20<sup>th</sup> century.

Federation saw the rapid expansion of navigation aids around Australia, including in those areas which were far from the capitals and were of national rather than colonial



importance—the northern Australian coast, Torres Strait and the northern Great Barrier Reef.

The number of places directly associated with important advances in knowledge of the continent understandably declined during the ‘infill’ era. The shape of the continent was now well known, and natural history and ethnographic research had largely refocused on the interior. The inland sea was not looked for on the coast, but in the desert. The development of knowledge of the coast took on a finer grain, shifting from the illumination of whole stretches of coast to the detailing of the form and resources of specific bays, estuaries and peninsulas. The whaling potential of particular bays, the links between potential harbour or loading sites and the forestry, pastoral or agricultural potential of hinterlands, and the best sites for coastal settlement became important questions for surveyors and administrators. In the late 20<sup>th</sup> century the focus changed again, with detailed investigation and mapping of the continental shelf.

Places that stand out as potentially significant in this period are:

- Raine Island Beacon, the first physical marker of a safely surveyed shipping route through the Great Barrier Reef
- the early lighthouses, cementing knowledge of the hazards of coastal navigation—Iron Pot and Low Head, Tasmania; Rottnest Island, WA; Cape Morton, Qld; Cape Don in the NT; and perhaps Booby Island in Torres Strait
- Somerset settlement on Cape York, an early attempt to protect and service the now established Torres Strait route
- Green Hill Fort on Thursday Island, and Princess Royal Fort at Albany, showing the value placed on the well established and strategically important sea routes
- the north coast settlement sites at Fort Dundas, Raffles Bay and Port Essington, indicative of perceptions of the commercial and strategic value of the coast
- Hydrographers Passage, an example of the more recent discovery of a shipping route to meet new shipping requirements.







# 7

## DISCOVERING AND CHARTING AUSTRALIAN ANTARCTIC TERRITORY, HEARD ISLAND AND MACQUARIE ISLAND

### AUSTRALIAN ANTARCTIC TERRITORY

The conceptualising and definition of Antarctica was a slow and laborious process.<sup>247</sup> The discovery of the Australian Antarctic Territory (AAT) is a subset of that story. James Cook defined the envelope for Antarctica during his second voyage in the *Resolution* in 1772-1775, when he circumnavigated the continent through the Southern Ocean, reaching south of 60°South in four areas, one south of Australia, and three times reaching below the Antarctic Circle. Thaddeus von Bellinghausen repeated Cook's circumnavigations, spending even more time below 60°South and the Antarctic Circle in 1819-1821. John Biscoe, a captain seeking sealing prospects, saw land from the *Tula* at the extreme western end of the AAT in January 1831, and the French explorer Dumont d'Urville in the *Astrolabe* sighted land south of Hobart in January 1840, the basis for the French claim to Terre Adelie, which separates the two parts of the AAT. Also in 1840, the American Charles Wilkes sailed the *Vincennes* parallel to the coast of the AAT from near Cape Hudson to the Shackleton Ice Shelf and claimed several sightings of land. In the following year James Clark Ross in HMS *Erebus* and HMS *Terror* penetrated the Ross Sea, and also sailed close to Terre Adelie.

The first landing of a human on the AAT was in 1902, when the German Eric von Drygalski in the *Gauss* wintered off Wilhelm II Land, and landed on the mainland and discovered the distinctive coastal nunatak, Gaussberg. Douglas Mawson organised the Australasian Antarctic Expedition of 1911-1914, and landed his main party at Cape Denison, Commonwealth Bay on 8 January 1912, where he erected his expedition huts now known as Mawson's Huts. A western party under Frank Wild was landed at the Shackleton Ice Shelf to the west on 19 January. Mawson's two parties carried out land-based exploration over the next year, a skeleton party staying at Commonwealth Bay a



second year to relieve Mawson, after he arrived back from a disastrous sledging trip in time to see his vessel, the *Aurora*, a departing speck on the horizon.

Mawson returned to the area that was to become the AAT with the British, Australian and New Zealand Antarctic Research Expedition (BANZARE) in 1929-1931, charting sections of the Antarctic coast from Commonwealth Bay to Enderby Land in Scott's former ship *Discovery* and by air. The primary objective of the expedition was 'the perfection of British title to what is known as the 'Commonwealth Sector' of the Antarctic continent', and Mawson was empowered to take possession of any land he discovered, which he did at Commonwealth Bay, Scullin Monolith, Proclamation Island and Cape Bruce.<sup>248</sup> A British Order in Council in February 1933 affirmed British sovereignty over Antarctic territory between 160°East and 45°East, excluding the French Adelie Land. Britain handed this territory to Australia, formalised on 24 August 1936 in the *Australian Antarctic Territory Acceptance Act*.

The major US post-war naval exercise, Operation Highjump, saw major aerial mapping take place across the AAT in 1946-1947. Operations were divided into three sectors, the AAT being within the Western Group's area. The most significant discovery of the operation was the sighting of the ice-free area of the Bunger Hills in Queen Mary Land by Commander David Bunger. The Western Group mapped over a third of the continent's coastline, between 160°E and 40°E, and penetrated up to 800 km inland. The success rate of the aerial photography, however, was low, and Operation Windmill, centred at the Windmill Islands near the current Australian Casey Station, was carried out in the following year (1947-1948) to improve ground control by the use of helicopters.

right: Antarctica. Looking across sea ice to the ice shelf and Vestfold Hills near Australia's Casey Station.

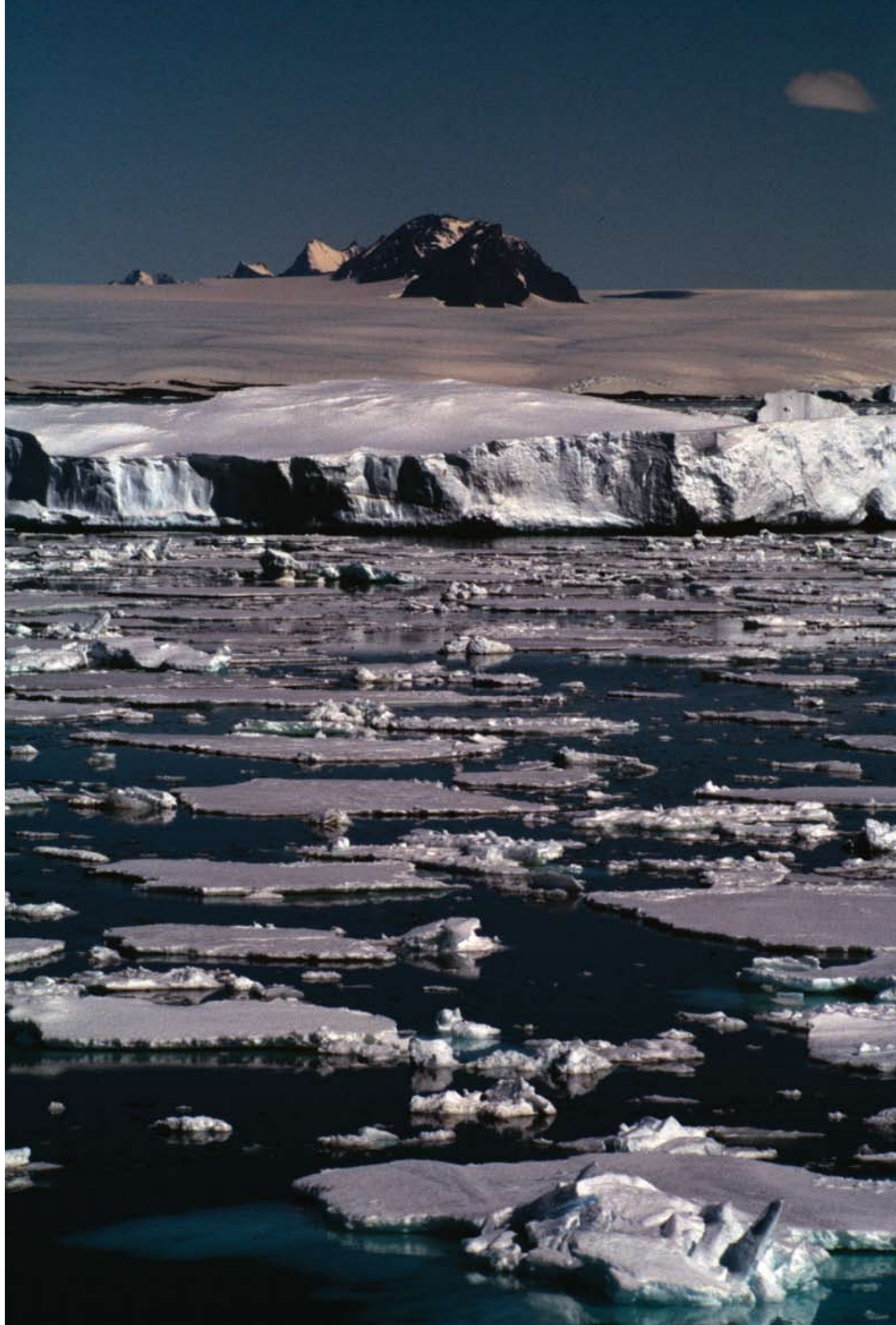
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below: Mawson's Hut in Antarctica. The last great frontier of Australian exploration.

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In the environment created by the US build-up in operations Highjump and Windmill, Sir Douglas Mawson lobbied for and achieved the establishment of the Australian National Antarctic Research Expeditions (ANARE) in 1947. Research bases were established at Atlas Cove on Heard Island on 26 December 1947 (Heard Island was claimed for Australia on the same day), and Macquarie Island on 21 March 1948, using the tank landing craft HMALST 3501 (*Labuan*). The Australian Government decided to set up the Antarctic Division within the Department of External Affairs in May 1948.<sup>249</sup> An attempt was made using the sealing vessel *Wyatt Earp* to establish a base on the mainland, but without success. Success was achieved in the chartered Danish ship *Kista Dan*, when Mawson Station was opened at Horseshoe Harbour in MacRobertson Land on 13 February 1954. This became a base for extensive exploration of that sector of the AAT. Australia extended its Antarctic exploration from Davis Station, established as an ANARE base on 13 January 1957, and from Wilkes Station, built by the US in 1957 and taken over by Australia on 4 February 1959. Wilkes was replaced by the new Australian Casey Station in 1969.

## MACQUARIE ISLAND

Macquarie Island was discovered by Captain Frederick Hasselburgh in the *Perseverance* in 1810, while seeking new sealing grounds for the Sydney company of Campbell & Co. His discovery started a fur sealing rush, which saw the fur seal population of the island nearly completely destroyed by 1815. The island became administratively part of Tasmania in 1825. It was roughly charted by the Russian explorer Bellinghausen in November 1820, very roughly by William Langdon R.N. in the supply vessel *Lusitania* in 1822 and by Captain Neil Macdonald of the ketch *Gratitude* in 1899. The first detailed mapping, terrestrially based, was by L.R. Blake of Douglas Mawson's Australasian Antarctic Expedition of 1911-1914, which occupied the island as a research station and radio relay station.<sup>250</sup> An Australian research station was established at the Isthmus on 21 March 1948, using the tank landing craft HMALST 3501, and has been occupied constantly since then.

## HEARD ISLAND

Heard Island may have been sighted by Peter Kemp in the brig *Magnet* in 1833, and another possible sighting was made by Captain T. Long in 1849. The first confirmed sighting and accurate plotting of its position was made by Captain John Heard in the American barque *Oriental* in November 1853, and his name was applied to the island. The nearby McDonald Islands were discovered by the sealer Captain McDonald in the *Samarang* in 1854.<sup>251</sup>

Erasmus Darwin Rogers in the American sealer *Corinthian* made the first landing to undertake elephant sealing in 1855. Elephant sealing continued until 1882, and was again undertaken between 1907 and the 1930s. The island was visited by BANZARE in 1929, and an Australian research station was established at Atlas Cove on 26 December 1947, and occupied until 1954. ANARE has visited the island on a number of occasions since then, undertaking research activities. British sovereignty





A blizzard sweeps across the Laurens Peninsula and Mount Aubert de la Rue, Heard Island. The Atlas Cove ANARE station is around the bay to the right of the photo.

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over the island was transferred to Australia in 1947, confirmed in an exchange of letters in 1950, and by the *Heard Island and McDonald Islands Act 1953*.

‘Knowledge’ of Heard Island had two distinct contexts. The sealers internationally had knowledge of the resources of the island, American sealers in particular occupying its beaches, using at times Portuguese labour from the Canary Islands. Many sites of their activities survive. Scientific knowledge came with the *Challenger* expedition which visited the island in 1874, collecting biological and geological samples. Von Drygalski’s German South Polar Expedition also collected specimens in 1902. Douglas Mawson’s BANZARE spent seven days on the island, and ANARE started its scientific work there in 1947.

## MAPPING THE COAST

### —ANTARCTICA AND THE SUB-ANTARCTIC ISLANDS

The geographic and scientific knowledge of Antarctica and the sub-Antarctic islands is much more recent than much of the story of the mapping of the Australian continent. The first human landing on Antarctica was in 1821 by sealers who landed on the Antarctic Peninsula. In the sector south of the Indian and Pacific oceans, the first landing was not until 1895, and in the Australian Antarctic Territory not until 1902. Knowledge of the sub-Antarctic islands, in particular, was due largely to the little documented search by sealers and whalers for the resources on which their industry relied.



Alone among the continents, the exploration of Antarctica took place entirely in the era of scientific enlightenment, and most of its exploration had a large component of scientific research associated with it. A primary basis for the 'settlement' of the continent since WWII has been to establish scientific bases. The other motivation has undoubtedly been to establish national interests in any future division of the resources of the continent and its surrounding waters. As a result, many of the places of heritage potential are associated with scientific infrastructure, research, or territorial claims.

Places that stand out as potentially significant in this period are:

- Mawson's Huts, Commonwealth Bay, the site of Australia's first Antarctic scientific and exploration expedition, and site of one of the territorial claims to the AAT
- Scullin Monolith, Proclamation Island and Cape Bruce, sites of territorial claims to the AAT
- Atlas Cove on Heard Island, the ANARE station of Macquarie Island, Wilkes Station site, Mawson, Davis and Casey stations in Antarctica, as the bases for Australia's geographic and scientific investigation of the Antarctic.



# 8

## THE GREAT SOUTHERN LAND REVEALED

**T**he history of the maritime investigation of Australia has been presented in the foregoing text, but what does it all mean in an historical and contemporary sense?

Australia is unique in being the last habitable continent revealed to the world in 'modern' times. In the absence of an Indigenous written record, the continent's geography and natural history were investigated and reported by European navigators and scientists at a time when modern science was being invented. There was a great demand, from at least the time of Dampier's first book, *A new voyage round the world*, for both scientific and popular descriptions of the wonders of new-found lands, and the exploration of Australia filled the bill admirably. Europe was also still plotting the distribution of the world's natural resources, these being central to the economic and strategic development of the dominant nations. The investigation of Australia's resources drove much of the exploration agenda, even if the outcome turned out to be a disappointing absence of immediately exploitable wealth.

The delineation of the Australian continent from the mythical mass of Terra Australis was one of the most enduring geographical puzzles facing European scholars. The history of the resolution of that puzzle directly paralleled the history of the rise of the Enlightenment, and the breaking away from the classical tradition of inherited knowledge and quasi-mythical cosmology, to a scientifically based understanding of the world and the animals and plants that inhabited it. The gradual unfolding of the insularity of the Australian continent by the Dutch, and the definition of the coastal margins by the English and French, was underpinned by the sea-change in philosophical, artistic, geographic and scientific thinking that took place between the start of the 17<sup>th</sup> century and the middle of the 19<sup>th</sup> century. The development in all these fields stimulated curiosity about and investigation of Australia, and the discoveries made there fed the rate of intellectual change.





The extent of those changes is brought into sharper focus when you consider the same period in other contexts. It saw the immense social and political transformations in Britain that separated the reigns of Queen Elizabeth I and Queen Victoria. In France it saw the reign of the Sun King, the Revolution, the flourishing of the philosophers who influenced world thinking, and the rise and fall of Napoleon. It covered the time separating Shakespeare and Cervantes from Dickens and Tolstoy; Monteverdi and Dowland from Verdi and Wagner; Gallileo and Descartes from Darwin and Marx. Australia was defined, named and settled by Europeans while this enormous change was occurring.

The early exploration voyages often carried amateur naturalists among their officers and crew, while the later expeditions carried professional natural scientists and artists. As a result, the first unfolding to science, and the public, of the botanical and zoological

*The d'Entrecasteaux Channel,  
between Bruny Island and the  
Tasmanian mainland.*

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oddities of Australia accompanied the geographical definition of the coastline. The unusual nature of the land and its human and natural history, together with its later colonisation through convictism, establish the 'personality' of the continent in the European popular mind up until at least the end of the 19<sup>th</sup> century.

The story of exploration of the continent was not just one observed from afar by European armchair readers and imperial planners. From 1788 onwards, the exploration and survey of the coastline had major implications for the growing number of Australian colonists. The gradual clarification of the shape and unity of the continent, and the charting of the huge spaces separating the 'archipelago' of colonial settlements clinging to its coasts, were treated as economic intelligence by the local merchants and pastoralists, who stood to benefit from the expansion of pastoral production and trade. The colonial administrations focussed on development of well-surveyed and charted sea routes to service the colonies, and the opportunities for the location of government settlements, including convict establishments, around their coasts. Detailed surveys of the ports and their approaches became essential when new distant settlements were established. These took advantage of geographical positioning for trade (as with the early northern Australian settlements), to secure British interests (as with the Tasmanian settlements and Norfolk Island), or to tap promising grazing land or other natural resources (as with many coastal settlements in all the colonies). Good navigation to these distant ports was essential for their effective control by the colonial governments.

The colonies jointly also gradually recognised the security and defence implications posed by the vast coastline of the continent. The establishment of the basic geography of the coast and the key sea routes around it led directly to the realisation of the vulnerability of the colonies' economies to foreign intervention. The intercolonial cooperation in establishing fortified outposts at Thursday Island and King George Sound, key points where the trade routes entered 'Australian' waters, rather than the waters of individual colonies, were actions presaging Federation.

The concept of a 'nation' could only start to be thought about once the continent was defined as a unified land mass, and the general geography of its largely dry edge understood. In a sense, the charting of the coastline and of the sea routes supporting Australia were prerequisites to the emergence of the Commonwealth of Australia. When the Commonwealth was formed it took over all of the functions associated with national waters and sea routes, such as lighthouse development and navigation safety, hydrographic survey and chart making, and control of the navy and the merchant shipping industry.

The importance of hydrographic survey and investigation is not limited to the earlier periods of Australia's history. In the late 20<sup>th</sup> century the need for deep-water access to a greater number of ports for natural resources export has led to the use of advanced global positioning systems in combination with the Laser Airborne Depth Sounder System (LADS) to speed up hydrographic survey. Ports in the north-west and Queensland for the export of iron ore, coal, oil and gas have been created or greatly expanded. New safe access routes to service these ports have also been identified and surveyed, such as Hydrographer's Passage through the Great Barrier Reef. Other oceanographic research has enabled continuing exploration of the ocean bed and the resources of the sea, adding to the economic resource base of the nation and leading to the extension of territorial boundaries.



The study on which this book is based was aimed at providing a context for the identification and assessment of places that might be entered in the National Heritage List. While no individual place has been proposed here for National Heritage Listing, a large number of places have been identified throughout the book that were in some way related to the historical exploration or survey activities described. While it is probable that few of these places may end up meeting the relatively high threshold of having characteristics of outstanding value to the nation that is applied to National Heritage Listing, their stories are an important part of the process of determining what we should value as a nation. The relative heritage assessment of such places in relation to the overall story has yet to be undertaken.

In conclusion, it is hoped that this book has stimulated a greater awareness of the rich stories of the exploration and scientific investigation of our coasts. These stories stretch over 400 years. Some of them relate to the world story of the exploration of the globe and the development of science and navigation. Others are Australian stories, recording the first non-Indigenous attempts to come to grips with the 'new' continent, and the later process of gathering geographical knowledge for settlement, trade and resource exploitation. This process continues today. It is also hoped that an increased knowledge of this history will stimulate the recognition and protection of the most important places associated with the exploration of the Great Southern Land.



*The wreck of the Maheno on Fraser Island, Queensland.*  
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# ENDNOTES

## Introduction

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# GLOSSARY

<b>Atlas</b>	A collection of maps, in the form of a book. It gets its name from the use of the name of the Greek god by Antonio Lafreri on the title page of his collection of maps in 1570, and from Gerard Mercator's use of 'Atlas' (this time for the Mauretanian king of that name) in the title of his famous book of maps (1595). The association of the god Atlas and the book of maps became fixed in the public mind. The first true Atlas in the modern sense was Ortelius' <i>Theatrum orbis terrarum</i> , published in 1570.
<b>Azimuth compass</b>	A compass fitted with a circle marked in 360 degrees, and a sighting vane allowing the horizontal bearing of objects (particularly celestial bodies) to be taken. The azimuth compass was used to take bearing of coastal features in a running survey (qv).
<b>Cable</b>	A unit of measurement at sea, usually between vessels or between vessels and the shore or feature. In British usage it is one-tenth of a nautical mile (608 feet), but is usually rounded down to 100 fathoms, 200 yards or 182.88 metres. To complicate matters, the US has until recently taken a cable to be 120 yards, and other countries have used different measurements.
<b>Careen</b>	To haul a vessel on its side to give access to the ship's bottom on the opposite side, for cleaning or repair. It was usually done by mooring the vessel on a sloping beach, and hauling the ship over by tackles leading from the mastheads to the shore. The fall of the tide could assist the process.
<b>Chart</b>	The representation of a plane surface of an area of the spherical globe for use for navigation purposes. A chart is a map of a sea area, showing coastlines, rocks, navigation aids (including the flash characteristics of lights), prominent features ashore observable from the sea, depth of water, and a compass rose. Modern charts provide latitude and longitude rulers on each edge of the chart, from which distances can be measured. Charts commonly also include sketch views of the coastline at prominent points to assist navigators.
<b>Compass rose</b>	The points of the compass printed on nautical charts, traditionally divided into the 32 primary compass points (eg north, north by east, north-north east, north east by north, north east etc). Modern compass roses are divided into 360 degrees, and include an indication of magnetic north and its annual variation. Early charts had many compass roses printed across the sea area with primary points extended to the edge of the chart (rhumb lines). These were to allow navigators to mark off courses and bearings more easily. Modern charts might have two or more compass roses depending on the size of the chart and the arrangement of sea and land areas.
<b>Fathom</b>	Six feet or 1.828 metres, the measurement used for water depths on all nautical charts until recent times. A fathom was roughly 1/1,000 <sup>th</sup> of a nautical mile. Prior to the adoption of the metric system in 1799, the French 'toise' was also equivalent to six feet.
<b>Fother</b>	To place a patch over a hole in the hull, in the form of a mat made by threading lengths of yarn, fibre or cloth into a sail and hauling this under the hull with ropes so that water pressure forced the matted material into any hole, slowing water entry. Cook used the method most famously at Endeavour Reef in 1770. The modern version is called a collision mat.



<b>Gores</b>	Triangular pieces of a map in the form of a three dimensional globe, rather than on a two dimensional sheet.
<b>Great circle</b>	The largest circle that can be drawn on a sphere, generated by a plane that cuts the earth's centre. The equator and all meridians of longitude are examples of great circles. A great circle course is the shortest route between two points. Great circle routes are, however, difficult to navigate (except those running north-south along meridians or east-west around the equator) because the bearing in relation to lines of latitude and longitude changes continuously. (see also 'Mercator projection' and 'rhumb line').
<b>Latitude</b>	One of the spherical coordinates (with longitude) used to describe a terrestrial position. The geocentric latitude of a point is its vertical angle above or below the equator, measured from the centre of the earth. However, because the earth is not an exact sphere, geographical latitude is calculated from the altitude of the elevated celestial pole at the place. Hence navigators can establish latitude by the measurement of the altitude of the sun at local noon, or of stars at night with the use of astronomical tables. The line joining all places of the same latitude around the world is a parallel of latitude.
<b>League</b>	The distance of a league varied over time and location, but in British usage it was 3.18 nautical miles (= 4 Roman miles), but this was usually shortened to 3 nautical miles or 5.5 kilometres. One explanation of its origin is that it was the distance a ship should be able to cover in one hour in moderate conditions: another that it was the distance the Roman Legions were expected to cover in the one hour. In other nations a league varied from 2.4 to 4.6 statute miles (3.86 to 7.4 kilometres).
<b>Longitude</b>	One of the spherical coordinates (with latitude) used to describe a terrestrial position. A meridian of longitude is a great circle joining the two poles, crossing the equator and parallels of latitude at right angles. Longitude is measured east or west of a designated prime meridian, previously chosen by France being that running through Paris and that for Spain running through the Azores, but by international agreement in 1880 the prime meridian was established as that of Greenwich.
<b>Magnetic compass</b>	A magnetic compass has a magnetised needle, or in the case of most nautical compasses, a card, mounted on a central pivot, which allows the compass needle or card to align itself to magnetic north. Ship's compasses during the age of exploration included a steering compass, divided into the 32 primary compass points (eg north, north by east, north-north east, north east by north, north east etc), from which the ship's course was read, and an azimuth compass (qv) with a card divided into 360 degrees, used for taking horizontal angles to celestial objects or coastal features.
<b>Mercator projection</b>	A projection, invented by Gerard Mercator in 1569, that presents the globe as if projected onto a cylinder whose circumference is the equator, then unwrapped to produce a flat chart. Meridians, because they converge on the poles, are spread outwards to become parallel lines, and the distances along the parallels of latitude are stretched accordingly. Similarly, parallels of latitude become incrementally further apart as they approach the poles. The degree of distortion is derived from mathematical equations. As a result of the distortion required, Mercator charts do not maintain a constant scale across the face of the chart, and nautical charts have a graduated scale of degrees and minutes along each edge, from which adjacent distances are measured. However, the projection enables straight (rhumb) courses to be drawn as straight lines on the chart, and bearings drawn on it are true (see also 'projection', 'rhumb lines', 'great circle').
<b>Meridian of longitude</b>	See longitude.
<b>Nautical mile</b>	One minute of a great circle of the earth, 2,025 yards, 1.15 statute miles, or 1.852 kilometres. The nautical mile is used in all navigation and maritime survey work. The international nautical mile is now set at 6,076.11549 feet, or 1,852 metres.
<b>Nunatac</b>	An exposed mountain peak, surrounded by glacial ice.
<b>Parallel of latitude</b>	See latitude.
<b>Portulan chart</b>	Or 'portolan', an early chart first appearing in the Mediterranean in the 13 <sup>th</sup> century to meet the practical needs of seamen in coastal navigation. It was heavily covered with compass roses and rhumb lines,, and was used in combination with sailing directions called <i>portolano</i> (see also 'rutter').
<b>Projection</b>	Any systematic representation of meridians and parallels portraying the curved surface of the earth on a flat surface. The two most common forms of projection either represent the bearings between two points as straight lines, such as the Mercator chart; or represent great circles as straight lines, such as the gnomonic chart (see 'Mercator projection').



<b>Rhumb line</b>	A course with a constant true direction and that makes the same angle with all meridians. On a Mercator projection a rhumb line is a straight line, and is easy to follow using a compass bearing. However, unless the rhumb line follows the equator or a meridian, it is not the shortest route between two points. The difference between rhumb line routes and great circle routes can be significant eg the great circle route between Sydney and Valparaiso is 6,106 nautical miles, while the rhumb line route is 6,902 nautical miles (see also 'Mercator projection' and 'great circle').
<b>Running survey</b>	A continuous survey of a stretch of coast, made by taking bearings with the azimuth compass of the prominent coastal features in site from the ship, which was anchored or hove-to to provide a steady observation point. The observations were repeated from a new position several miles along the coast, and newly visible coastal features added. A sketch of the coast was made at each observation position, and the bearings to each coastal feature noted on the sketch. The progress of the ship between observation positions was measured by log, and the resulting triangulation of the bearings taken transferred to the chart, building up a 'running survey' of the coastline.
<b>Rutter</b>	The name given to sailing directions published in Britain during the 16 <sup>th</sup> and 17 <sup>th</sup> centuries, deriving from the Portuguese <i>roteiro</i> (route) via the French <i>routiers</i> . Similar sailing directions had been used in the Mediterranean from the 12 <sup>th</sup> to 15 <sup>th</sup> centuries where they were called <i>portolano</i> .
<b>Wind rose</b>	A compass used on charts before the introduction of the magnetic compass. It was specific to the area being charted (usually in the Mediterranean), and indicated the prevailing wind at different times of the year. The use of the wind rose required knowledge of the characteristics of the particular wind (temperature, humidity etc), and it did not enable any degree of certainty in navigation.

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