Cook the Map-Maker

Introduction

For James Cook, the production of a new chart was his principal reason for going to sea. He then set himself high standards so that any chart he drew would be of the highest quality and such that he would have no cause to repeat or modify it. His charts were aimed at fellow seamen so he incorporated as much information as possible while employing an economy of style and little elaboration. Engravers and other cartographers could embellish his charts later but Cook rarely added cartouches and certainly never include cherubs or whales! The quality of his charts can be confirmed by the fact that some from Newfoundland and New Zealand could still be safely used over one hundred years later. His last piece of the New Zealand hydrographic chart was only removed in the 1990s.

When James Cook entered the Pacific Ocean in January 1769 he was a skilled seaman with nearly 20 years’ experience in the Merchant and Royal navies behind him. He had acquired high competence in seamanship and navigation, to which he had added a supreme ability to conduct surveys and produce sea charts. He had only been surveying and charting for 10 years, but in that time he had become expertly proficient in these arts. The opportunity, therefore, of sailing to the Pacific could not have been offered to a more suitable or grateful officer. Cook’s instructions at departure were to first observe an expected Transit of Venus and then to search for Terra Australis – Cook’s own private motivation was the compilation of new charts.

Cook had learned to conduct surveys at Louisbourg, Cape Breton Island, in August 1758 after a chance meeting with Samuel Holland, a Dutch engineer serving in the British army with James Wolfe. The French defenders at Louisbourg had just surrendered to the British forces and Holland was using a plane table on a nearby beach when Cook observed him at work. He approached Holland and asked to be shown how to use the equipment and how to do this work. Holland agreed and Cook proved a quick and able learner, encouraged by John Simcoe, captain of HMS Pembroke, of which Cook was the master. Simcoe was one in a line of benefactors who
recognised qualities in Cook and helped further his career. Within a couple of months Cook had produced his first known chart, that of Gaspé Harbour near the mouth of the St. Lawrence River. Cook’s own financial position would have prevented him paying for the chart’s publication so someone else, probably Simcoe, arranged for the chart to be published in London.

Cook, as master of the *Pembroke*, was the senior non-commissioned officer, responsible for over 400 men and the day-to-day running of the ship. Among other responsibilities, according to *The Admiralty Regulations and Instructions* (1745 ed.), a master was expected to record new coasts visited by producing charts, sailing directions and drawing coastal views:

VII He is to apply himself to observe the appearances of coasts and how they show themselves in different points of view and if he discovers any new shoals or rocks underwater, to note them done in his journal, with their bearings and depth of water.

Cook was, therefore, in his usual diligent fashion, improving his ability to perform his duties. He was lucky though that Holland was a good teacher and colleague and that Simcoe offered him the time and opportunity to learn.

In 1759, Cook and Holland produced a meticulous chart of the St. Lawrence River and Gulf. This was based partly on captured French charts and partly on new British surveys in which Cook had played a significant role. Admiral Charles Saunders, who had led the British fleet during the Quebec campaign arranged for the chart to be published in London together with detailed sailing directions. Officers of the time were expected to pay for their charts to be published and once again Cook was relying on the generosity of senior officers. It would only be in 1793 that Britain established a Hydrographic Office to co-ordinate the production, publication and dissemination of charts.

Captain John Simcoe was a man of learning and carried a library with him on the *Pembroke*. With his encouragement, Cook immersed himself in mathematics and astronomy textbooks housed on board. After the siege of Quebec in 1759, Cook transferred to become master of HMS *Northumberland* under Commodore, Alexander, Lord Colvill. They were based at Halifax, Nova Scotia for over two years which allowed Cook the opportunity to hone his skills further. Therefore, in August 1762, when Cook was part of a flotilla sent to recapture Newfoundland from the French, he was able to compile accurate charts of many of the harbours around the Avalon Peninsula.
Colvill wrote letters to the Admiralty praising Cook’s charts and his reputation was quickly recognised by Thomas Graves, the governor of Newfoundland. Graves had realised the poor quality of charts of the island and, in 1763, he made representations to the British Government that a surveyor be immediately appointed to remedy the situation by conducting a careful survey of the long and intricate coastline. It is most probable that he always had Cook in mind and Cook was soon appointed to the role.

Cook returned to Newfoundland in 1763 and began a procedure that he would repeat over several years. The climate of Newfoundland closed down the island for several months over the winter and Cook followed the routine adopted European fishermen who crossed the Atlantic to fish the Grand Banks. He sailed to Newfoundland in the spring, worked hard over the summer months before crossing back to Britain late in the year. During the winter months he produced fair copies from the rough charts he had compiled during the summer.

Hugh Palliser replaced Graves as Newfoundland’s governor in 1764. Palliser had already been Cook’s captain from 1755 to 1757 and the two men now formed a working partnership that developed into a close friendship. Palliser was a principal supporter Cook’s appointment to the Endeavour in 1768.

By 1768, Cook had produced an incredible portfolio of charts, sailing directions and other material detailing about two-thirds of the Newfoundland coastline. Cook arranged for Thomas Jefferys, a London mapseller, to publish his charts and they continued to be incorporated in other publications for many years. Cook’s charts were very much working documents intended to be used by other seamen. To this end, he rarely spent time introducing elaborate cartouches or filling empty spaces with whales or other figures. Instead, he filled those spaces with more detailed charts of harbours or other important features. For example, his chart of the Northern Peninsula and Strait of Belle Isle in Newfoundland has five such detailed inserts.

Chart of Newfoundland here please

Cook’s charts came to be trusted in a way that those of many of his predecessors and successors were not as his were meticulous and extremely accurate given the equipment he had at his disposal and the conditions he had to work under. Cook blended land-based triangulation surveying with offshore running surveys. Cook performed the survey work onshore or close
inshore in small boats while his mate took soundings and sightings offshore in their vessel, the *Grenville*. Cook then combined all the information into charts which even showed individual rocks, shoals, etc and whether they were covered at high water. Some of his original drawings still have the onshore triangulation lines showing.

In early 1768, Cook was selected to lead an expedition initiated by the Royal Society to observe the Transit of Venus expected in 1769. The Royal Society petitioned the Government for financial assistance and a vessel to transport scientists to the Pacific. The Admiralty agreed to furnish a vessel but insisted on one of its own officers to captain her. Philip Stephens, the Admiralty Secretary, with support from Hugh Palliser, proposed James Cook and after some negotiations Cook was appointed. Some writers have subsequently asked why Cook was selected as he was largely unknown at the time and not even an officer. A better question would be “who else could they have chosen?” – Cook was by far the most suitable and best qualified. He possessed all the skills required and by passing his lieutenant’s examination in May 1768 he satisfied that requirement as well. Importantly, Cook was known and respected by the men running the Admiralty and they had every faith in him.

Cook was also fortunate in that, at the time he was working, British scientific instrument makers were leading the world in the development of new instruments and the improvement of existing ones. Cook was prepared to use these new instruments but only if he could see that they offered sufficient advantages. For example, he carried early trial versions of the marine chronometer and was only gradually won over to them, remaining loyal to the lunar distance method of calculating longitude.

Among the craftsmen working in London at the time were John Bird, Jesse Ramsden, Jonathan Sissons, James Short and John Dollond. Existing instruments included compasses, telescopes, backstaffs, astrolabes, octants and quadrants. Telescopes, both reflecting and refracting, were improved dramatically during the mid-eighteenth century especially by Short and Dollond while Sissons developed theodolites. Cook used examples of their work in the Pacific. John Bird, working with John Campbell, a naval captain, adapted the quadrant by adding a telescope sight and giving it a greater arc (one-sixth of a circle), which allowed a far more precise determination of latitude. This was the sextant and Cook used an early version.
Determining longitude was more difficult. Cook had learned the lunar distance method which required long calculations each time using tables produced in Germany in 1753 by Tobias Mayer, a German mathematician. John Harrison meanwhile was developing the marine chronometer and Cook carried versions on his second and third voyages enabling him to record his position more quickly and correctly.

Cook as well as developing surveying skills had become an extraordinary navigator. Whereas other European explorers managed to cross the Pacific hardly making contact with land, Cook bounced from island to island like a ball in a pinball machine. More than other navigators he blended scientific navigation with intuitive methods, similar to those used by the Pacific peoples he was sailing amongst. Cook found his way to new islands by recognising the tell-tale signs of the proximity of land such as cloud formations, land birds flying around the ship, and flotsam on the water. His work was significant not only for the islands he located but for the large swathes of open water that he determined from ocean swells and currents.

Prior to the *Endeavour* voyage, the few existing charts of the Pacific were so poor and imprecise as to be virtually useless to Cook. His predecessors had little desire or ability to draw charts and also lacked the instruments with which to produce them. For any sailor, it was important to carry charts if they were available and, where possible, the latest versions of those charts. However, many were out of date and did not carry the latest information. In some cases, that information had been withheld, either for political or economic reasons.

Cook therefore had a largely blank canvas when he entered the Pacific. Many islands and island groups had not been visited at all by Europeans and remained unknown; others had been visited by Europeans but their locations had been set down so incorrectly that later travellers either could not find them again or were not sure if they had come to the same islands.

The Pacific peoples themselves often had excellent knowledge of the region around where they lived but their knowledge was oral and not set down on paper. Cook soon set about filling in the blank spaces so that the chart produced after his third and final voyage in 1780 was very different. Compiled and drawn by Henry Roberts following Cook’s death, it is recognisable as the chart we have today. Virtually all the major islands and island groups were now recorded and in their correct location.
Three charts produced by Cook in the Pacific serve to demonstrate his ability and output. The charts of Tahiti, the New Hebrides (Vanuatu) and New Zealand wonderfully show the different methods employed and standards achieved.

Cook arrived in Tahiti in April 1769, ready to observe the Transit of Venus on 03 June. An observatory was set up at Point Venus, Matavai Bay, and after the transit had been witnessed, Cook undertook a tour of the island on foot and by row boat. The *Endeavour* only visited the north coast of the island so knowledge of the other coasts was acquired on this trip which lasted from 26 June until 01 July. This was a traditional land-based survey starting from a base line at or near Matavai Bay. Cook then took foresights and backsights as he progressed round Tahiti Nui and Tahiti Iti in a clockwise direction. The resulting outline of the island, together with reefs, is depicted marvellously while the interior is only hinted at as the mountainous terrain and vegetation cover prevented access.

Map of Tahiti here please

During this first voyage, Isaac Smith, a second cousin of Cook’s wife, Elizabeth, was one of several young men used to draw the neat final versions of charts. Cook had been trained by Holland and he now recognised the need to train his men in surveying and many of his “young gentlemen” benefitted over the course of the three voyages. Only one of Smith’s versions of Tahiti shows the neighbouring island of Moorea (here called Eimeo) and, while Tahiti is shown well, Moorea is totally unrecognisable. Cook himself had not visited Moorea (and did not until the third voyage) so its inclusion here is strange and represents a rare, significant drop in Cook’s own high standards.

Cook was no artist and his coastal views are poor, so he was fortunate in having with him on the *Endeavour* Hermann Spöring who produced extremely good pen and ink coastal views of both Tahiti and New Zealand to compliment the charts.

On leaving Tahiti and the other Society Islands, Cook made a short attempt to find Terra Australis but the poor condition of the *Endeavour* soon forced him to head for New Zealand. Reaching there in early October 1769, Cook would remain for six months during which time he made a circumnavigation showing it comprised two main islands. Cook’s chart of New Zealand is one of his most famous (and rightly so) as it represents some of his best work with New
Zealand immediately recognisable. The major islands are depicted correctly with only two errors: Banks’ Peninsula was depicted as an island and Stewart Island was depicted as an extension of Te Wai Pounamu (the South Island). Given that Cook sailed around Te Wai Pounamu without landing, these should be regarded as minor failings.

Cook made several landings on Te Ika a Maui (the North Island) and many charts were produced of harbours and inlets. He used a running survey for much of New Zealand. In this, he would take sightings of features on shore from one location at sea before sailing on to a second location to take new sightings, at the same time estimating the distance between and direction from the two locations, and the co-ordinates of both. This was repeated many times over to obtain the whole picture. The outline he produced is remarkable. While his latitudes were nearly correct, there are some minor errors in his longitudes, but they should not detract from what is a marvellous chart.

Map of New Zealand here please

Matavai Bay in Tahiti and Queen Charlotte Sound in New Zealand were favourite locations for Cook and he returned to both on his second and third voyages. However, he did not waste effort making new versions of existing charts but concentrated on preparing charts of newly visited locations. For example, Dusky Sound, bypassed on the first voyage, was charted on the second. On the second voyage, Cook visited Vanuatu (he called them the New Hebrides) in 1774. He carried out a running survey in just over four weeks’ sailing and the resulting chart of the island group is one of his best.

Map of New Hebrides / Vanuatu here please

New instruments carried on board on later voyages allowed him to refine and correct the co-ordinates of his anchorages. The following table shows that the determination of latitude was already a relatively easy and precise process. However, Cook’s voyages took place while great strides were being made in calculating longitude and the table also shows how Cook’s accuracy improved over the three voyages. The earlier figures were derived by Cook using lunar tables, but by the third voyage more correct figures were obtained using marine chronometers. His co-ordinates for Queen Charlotte Sound were only out by 5 seconds (latitude) and 6½ minutes (longitude) by the third voyage, a remarkable achievement.
Early in his career, Cook was aware of his lowly status when naming locations and features during his travels. There is little direct evidence that he named many features in Newfoundland. Most features on that island already possessed names and Cook learned them from local fishermen he used as pilots. Cook’s Harbour on the Northern Peninsula may be a rare occasion where he named something after himself.

When Cook transferred to the Pacific he still had little confidence and realised the need to please his masters at the Admiralty and other dignitaries back in Britain by honouring them by using their names. Stephens and Palliser both had several features named after them in Australia and New Zealand. A few members of his crew had features named after them but, interestingly, at no time did Cook name anything after any member of his own family.

That Cook used few local names in the Pacific and Australia and instead imposed British names also reflects the limited contact he often had with indigenous peoples and associated problems of communication with them. For example, Cook’s chart of the East Coast of Australia has a string of British but no Aboriginal names. Where better understanding occurred such as at Tahiti, more local names appeared on the charts.

During the later voyages, Cook gradually delegated the survey work and cartography to his crew. Several men went on to become explorer-cartographers in their own right. James Colnett, Nathaniel Portlock and George Dixon led expeditions and produced new charts. George
Vancouver, though, was Cook’s greatest protégé and his survey of the Northwest Coast of America is equal in quality to Cook at his best.

Many of the *Endeavour* voyage charts were Cook’s own original work. They are practical and precise showing clarity and economy. Cook left it to engravers and cartographers back in Europe to elaborate them with cartouches and other additions. While the work of other cartographers was regularly replaced Cook’s work remained in use with a small part of Dusky Sound even lasting on the New Zealand hydrographic chart until the 1990s.

Copies of many of Cook’s Newfoundland charts were brought together by R.A. Skelton and published in 1965. Copies of all the charts of Cook’s Pacific voyages were assembled in three volumes edited by Andrew David and published by the Hakluyt Society. The two collections highlight Cook’s consummate skill. The testament to that skill is Cook’s map of the Pacific after the third voyage. It left little for others following him to add. One of the few explorers to rival Cook was Jean-François de Galaup de La Pérouse, who wrote of Cook in his journal when off Maui in Hawai’i in May 1786:

[I am] full of admiration and respect for the memory of this great man, I shall always regard him as the first among navigators and the one who determined the precise situation of these islands, who surveyed their coastline … but only men of his calibre leave nothing further to be known about the countries they have seen … certainly every navigator, owes him a tribute of praise.

Select Bibliography


