

AN EIGHTEENTH CENTURY JOINT SURVEY ON THE NORTH-WEST COAST OF AMERICA BY BRITISH AND SPANISH SURVEYORS

By Andrew David



Abstract

When the British surveying expedition under George Vancouver met a similar Spanish expedition under Dionisio Alcalá Galiano in June 1792 off Birch Bay, on the coast of present day USA state of Washington, they agreed to carry out a joint survey of the waters to the north of the Strait of Georgia. The resulting survey is a very early example of co-operation in hydrographic surveying between nations. It also highlighted the difficulties they encountered,



Résumé

Lorsque l'expédition hydrographique britannique conduite par George Vancouver a croisé la route de l'expédition espagnole similaire, conduite par Dionisio Alcalá Galiano, en juin 1792 au large de Birch Bay, sur la côte qui correspond aujourd'hui à l'Etat de Washington (USA), il fut décidé qu'un levé conjoint serait exécuté dans les eaux situées au Nord du détroit de Georgia. Le levé qui a été réalisé constitue un des tout premiers exemples de coopération hydrographique entre nations et a permis de mettre en évidence les difficultés rencontrées



Resumen

Cuando la expedición hidrográfica británica a las órdenes de George Vancouver se encontró con una expedición similar española bajo Dionisio Alcalá Galiano, en Junio de 1792, en aguas de la Bahía de Birch, en la costa del actual estado de Washington de los Estados Unidos de América, convinieron llevar a cabo un levantamiento conjunto de las aguas hacia el Norte del Estrecho de Georgia. El levantamiento resultante es un ejemplo muy temprano de cooperación entre las naciones en materia de levantamientos hidrográficos. Se destacan también las dificultades encontradas.

When the British surveyor George Vancouver and the Spanish surveyor Dionisio Alcalá Galiano met on 22 June 1792,¹ near Point Grey,² it was a meeting of two like-minded persons. Vancouver was 35 years old that very day while Galiano, as he was usually referred to, was three years younger, having been born on 8 October 1760. Both had a wealth of hydrographic experience behind them. Vancouver had served as a midshipman in the *Resolution* under Cook, during the latter's second voyage, and in the *Discovery*, during his third voyage. Vancouver then spent the next ten years in general service ships during which he surveyed Port Royal and Kingston harbours with the help of the gifted master, Joseph Whidbey, who later became Vancouver's valuable assistant during the survey of the North-west coast of North America.

Galiano's hydrographic credentials were even better than Vancouver's, having taken part in various hydrographic surveys during most of his naval career. He was first employed charting the coasts of the Iberian Peninsula under the celebrated Spanish surveyor Vicente Tofiño y San Miguel and then in the frigate *Nuestra Señora de la Cabenza*, commanded by Antonio de Córdoba, when he was in charge of astronomical observations and cartography on a surveying voyage to Magellan Strait. On his return to Spain, Galiano rejoined the survey of the Iberian Peninsula under Tofiño, which brought him to the attention of Alejandro Malaspina, who recruited him as the expedition's principal astronomer for his projected voyage to the Pacific.³

Their Lordships, when drawing up Vancouver's instructions, were well aware that he might encounter the Malaspina expedition and so instructed him that:

...if you shall fall in with any Spanish ships employed on any service similar to that which is hereby committed to you, you are to afford to the officer commanding such ships every possible degree of assistance and information, and to offer to him, that you, and he, should make to each other, reciprocally, a free and unreserved communication of all plans and charts of discoveries made by you and him in your respective voyages.⁴

Galiano and his fellow captain, Cayetano Valdés, were given similar instructions by Conde de Revillagigedo, viceroy of New Spain: If while at sea, on the north-west coast, or in the Strait [of Juan de Fuca] ships of other European nations are encountered, the commanders of the *goletas* will endeavour to observe the greatest accord with them, avoiding disputes which cause displeasure to their nations and delay the commission, and assisting each other reciprocally.⁵

It is not clear whether it was Vancouver or Galiano who first proposed that their two surveys should become a joint venture. The reason for this discrepancy probably lies in the fact that communication between the two parties would not have been easy since no one in either of the British ships could speak Spanish, while it is not clear how well Galiano spoke English since, according to Vancouver, he only spoke a little English, though according to Peter Puget, one of Vancouver's officers, he spoke it with great ease and fluency. However, it seems likely that the proposal may have come from Vancouver, since the Spaniards foresaw difficulties in a joint survey because the British had better ships and equipment, although they thought there could be compensations as they might gain some insight into British methods and techniques.⁷

It seems likely that Vancouver and Galiano would have shown one another their instruments and books. Malaspina had supplied Galiano and Valdés with an astronomical quadrant, an astronomical or regulator clock by John Ellicott, a large achromatic telescope and a smaller one, Arnold Box chronometer 61, Arnold pocket chronometer 344, a reflecting circle with stand, a theodolite, an azimuth compass, a mariner's compass⁸ and three artificial horizons.⁹

Vancouver had two chronometers, namely Kendall No 3, usually referred to as K3, and Arnold 82. He also had a similar collection of instruments as those issued to the Spanish surveyors. The two most important books held by Vancouver were the edition of the *Nautical Almanac* for the current year and the second edition of *Tables Requisite...*, which was published in 1781. Based on what Malaspina is known to have held,¹⁰ Galiano probably had a copy of the current British *Nautical Almanac*, its French equivalent¹¹ and also copies of the current Spanish *Almanaque Náutico y Efemérides Astronómicas*, which was first published in 1791, enabling Galiano to compute longitudes directly from Cádiz.

The first meeting between the two expeditions had occurred on June 14 when the Spanish schooners *Sutil* and *Mexicana* encountered the *Chatham* and *Discovery* at anchor off Birch Bay, about 30 miles south-east of Point Grey. Lieutenant William Broughton, commanding officer of the *Chatham*, at once called on Galiano on board the *Sutil* to offer, on behalf of Vancouver, who was absent on a boat trip, any assistance he could give. Galiano then showed Broughton Arnold 344 and told him they also had Arnold 61, which was presumably in the *Mexicana*, commanded by Cayetano Valdés. Broughton, in his turn, said that the British expedition also had an Arnold chronometer [No 82] and one by Kendall [K3].

Vancouver first encountered the Spanish expedition when he sighted their two schooners on 22 June off Point Grey, on his way back to join the *Discovery* after surveying Jervis Inlet, situated about 45 miles north of Point Grey. He at once went on board the *Sutil*, where he gave Galiano a copy of his recent survey, which included Burrard Inlet, except for Indian Arm, at the head of the inlet, which he had not surveyed. Vancouver noted that the officer's quarters on board the *Sutil* only allowed room for sleeping berths on each side, with a table in between at which four persons could sit with difficulty and in consequence the two schooners were, in his opinion, in all other respects, the most ill calculated and unfit vessels that could possibly be imagined for such an expedition.¹² Vancouver then returned to the *Discovery* in Birch Bay, whose position he had already determined, thus providing a starting point for the forthcoming joint survey. He had obtained the latitude of the bay by eleven meridian altitudes of the Sun and had deduced its longitude from observations made in Discovery Bay, on the southern side of Juan de Fuca Strait, where he had observed 220 sets of lunar distances, carried forward by his chronometers. Galiano had also established a starting point in the San Juan Islands, on the south-eastern point of Lopez Island, where he had obtained its longitude by observing the emergence of Jupiter's first satellite.

The joint British and Spanish survey began when Vancouver sailed from Birch Bay on 24 June, joining the *Sutil* and *Mexicana* later that day off Point Grey, where Galiano came on board the *Discovery* and informed Vancouver that he had now examined Indian Arm and presented him with a copy of his survey. The two surveyors then discussed the possibility that a passage to the open sea might be found if they continued to the north, as shown on a map in Meares's *Voyage* in which a track of the American fur-trading vessel *Washington* making such a passage was depicted.¹³ Galiano, however, was able to assure Vancouver that, notwithstanding the fact that the Spanish had lived on terms of great intimacy with Captain Gray and other American traders, they had no knowledge that anyone had performed such a voyage. However, Valdés, who had been with Malaspina at Nootka Sound the preceding year and spoke the local language fluently had been told by the natives that such a passage did in fact exist. (*Figure 1*)

On 26 June the four vessels got under way and, after passing Burrard Inlet and Howe Sound, about 10 miles north-west of Point Grey, which Vancouver had already surveyed, they proceeded through Malaspina Strait between Texada Island and the mainland, where Galiano began a running survey by measuring bases.¹⁴ They then passed east of Harwood, Savary and Hernando Islands, at which juncture it seemed to Vancouver that they had forsaken the main direction

of the Strait of Georgia as they were now encompassed on all sides by islands and rocky islets. Around dusk they entered a spacious sound leading to the north-east. Although the night was dark and rainy, they were forced to keep under way under the influence of wind and tide as they were unable to obtain soundings, until they were finally able to anchor about midnight on the north side of Kinghorn Island, just within the sound,¹⁵ which Vancouver named Desolation Sound. (*Figure 2*)

Next morning, which was fine and serene, Vancouver, Puget and one of the *Discovery*'s midshipmen, accompanied by Galiano and Juan José Vernacci, landed on Kinghorn Island to obtain the position of its south-western point. Vancouver took with him an artificial horizon and presumably a sextant on a stand, while Galiano took the stand of his achromatic telescope on which he mounted a theodolite. Using these instruments the two surveyors were able to observe the meridian altitude of the Sun, which Vancouver found gave a latitude of 50°6'N, while Galiano's latitude differed from this by a mere 20 seconds. Both instruments were also used to obtain local time, which compared with Vancouver's chronometer, gave the longitude of the point as 235°26' East of Greenwich, but, according to Vancouver, Galiano's chronometer observations placed the point farther to the west.

While these observations were being taken, four boat parties were being provisioned and, at the same time, Broughton was sent in one of the *Chatham*'s boats to seek a better anchorage further up the sound. In the afternoon he returned in time to inform the officers in charge of the various boat parties of a better anchorage he had found on the northern side of Teakerne Arm, on the east side of Lewis Channel. The boat parties then departed. Puget and Whidbey in the *Discovery*'s launch and cutter were sent to examine the continental shore, while James Johnstone, the master of the *Chatham*, was sent in charge of the *Chatham*'s cutter and launch to examine a sound leading to the north-west, while Valdés undertook to survey the intermediate coast in the *Mexicana*'s launch.

Immediately after the departure of the first three boat parties, the four vessels got under way and moved to the anchorage in Teakerne Arm. Here Galiano made some astronomical observations to rate his chronometers. Early the following morning, Saturday 30 June, Vancouver set off himself in the yawl to examine what appeared to be the main channel of the Strait of Georgia, to the west of Hernado and Savary Islands. However, bad weather forced him to return to the *Discovery*, where he found that Johnstone had also returned, reporting that all the land to the west and north-west appeared to form an immense archipelago.

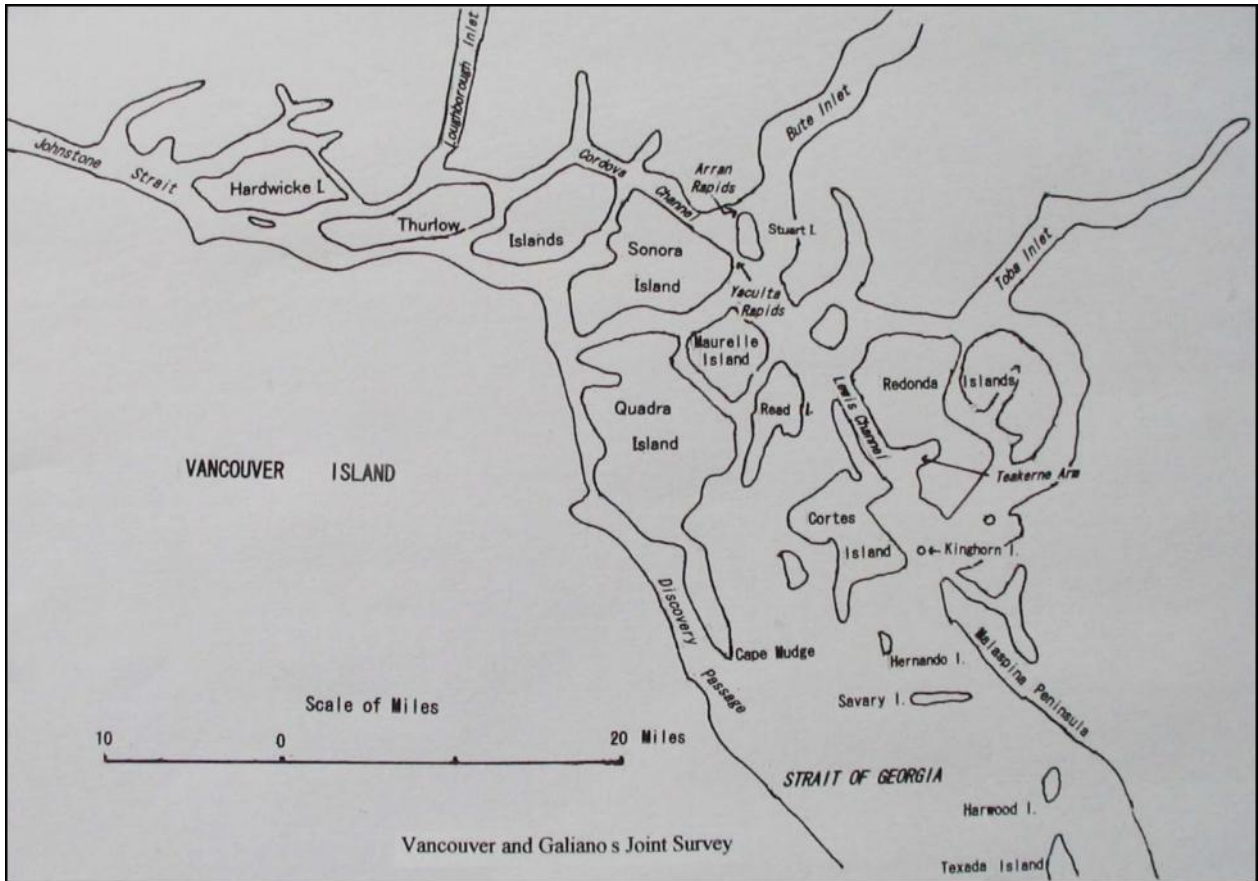


Figure 1



Figure 2

Meanwhile Valdés had also returned, having surveyed an inlet which Galiano named Canal de la Tabla after a plank of wood, covered with paintings, that he had discovered on its eastern shore. When Galiano's survey was engraved the name was changed to Brazo de Toba either by an engraver's error as suggested by Captain Walbran¹⁶ or in honour of Antonio Tova (or Toba), one of Malaspina's officers, as suggested by Henry Wagner.¹⁷ Hence its present name of Toba Inlet.

As Valdés was returning to the *Mexicana* he met Puget at the entrance to Toba Inlet and told him that the inlet was closed, but Puget nevertheless proceeded to examine the inlet himself. Because of this Galiano remonstrated with Vancouver telling him that the best way of advancing the survey was to have complete trust with one another and working together as though they were of the same nation. Vancouver replied that he did indeed have full trust in the Spanish surveyors, but he was expressly ordered in his instructions to explore all the inlets on the coast from 40°N to Cook Inlet. Galiano appears to have accepted Vancouver's explanation as they continued to dine amicably together.

While Puget and Whidbey were examining Toba Inlet, Johnstone, having also met Valdés, followed the continental shore further north, during which he discovered and surveyed Bute Inlet.¹⁸ He also discovered Arran Rapids, in the northern entrance to the sound between Stuart Island and the mainland, where the 'rapidity of the tide' caused him to conclude correctly 'that this narrow passage had communication with some very extensive inlet of the seas'.¹⁹ Shortage of provisions now forced Johnstone to return to the *Chatham* on 2 July. Three days later Johnstone was again dispatched with a week's provisions to continue his survey beyond Arran Rapids. He returned on the 12th with the welcome news he had discovered a passage leading to the open sea. Johnstone had first passed through Yaculta Rapids between Stuart and Sonora Islands. He then followed Cordero Channel to the west as far as the entrance to Loughborough Inlet, which he now followed being mindful of Vancouver's instruction to trace the continental shore. However, when he mistakenly thought he had come to the end of the inlet he turned back to its junction with Cordero Channel and then followed its western extension for about two leagues, to where the channel divided around Hardwicke Island. Johnstone decided to follow the channel to the north of this island, which brought him out into an open strait. He then followed this strait as far as the mouth of the Nimpkish River, some 50 miles west of Hardwicke Island, from where he had a clear view of Queen Charlotte Sound, Vancouver later naming this strait Johnstone Strait. Realising the importance of his find, Johnstone then returned to the *Discovery* to report to Vancouver, but pointing out that this route was

subject to strong tides, accompanied by overfalls, violent eddies and whirlpools.²⁰

On 1 July, Puget and Whidbey were sent to carry out the task that Vancouver had been forced to abandon the previous day. On their return four days later Puget reported that on the first night they had reached the northern end of Savary Island, where they pitched their tents and spent a comfortable night. Next day they continued south to Harwood Island, where they stopped for breakfast, from there they crossed over to the eastern shores of Vancouver Island, where they entered an inlet about a mile wide, leading in a north-north-west direction, whose eastern side was formed by a long narrow peninsula, terminating in Point Mudge, named by Vancouver after his first lieutenant, Zachary Mudge. Puget and Whidbey then followed Discovery Passage, as it was subsequently named by Vancouver, for about twelve miles, without any apparent end. The tidal stream was strong, with the flood coming from the north-west at about 5 knots, all of which indicated that the channel was of considerable extent. As he considered that this passage must lead to the open sea, Puget decided to return at once to the *Discovery* to report his findings to Vancouver as soon as possible.

The Spaniards meanwhile had not been idle. Between 3 and 5 July Galiano examined the continental shore between Point Sarah and Toba Inlet in the *Mexicana's* launch, naming two bays east of Malaspina Peninsula after Malaspina and Bustamante²¹. On the 7th Vernacci and Salamanca were sent in the launch to continue the survey to the west and on the 9th they entered an inlet which they named Quintano after one of Malaspina's officers. It was in fact Bute Inlet. While going about in heavy seas, the launch shipped several seas and nearly capsized, forcing Vernacci to take shelter for the night in a nearby cove. Next morning he continued on to Arran Rapids, waiting until slack water before passing through these rapids, where he encountered whirlpools and eddies caused by the strong tides. Some Indians they encountered informed Vernacci that the channel led to the open sea. (*Figure 3*)

In consequence of the discoveries made by Johnstone and Puget, Vancouver decided that Discovery Passage must lead to Johnstone Strait and to the open sea. He therefore informed Galiano and Valdés of these discoveries and that he intended to sail for Nootka Sound through this strait at the first favourable opportunity. The two Spanish officers now begged leave to decline accompanying Vancouver any further as the size of their vessels would retard his progress. They were also concerned at the smallness of their boats and the fact that they were not armed with swivel guns as were the larger British boats, both of which made it inadvisable for them to go far from the schooners.



Figure 3

After an exchange of surveys Vancouver sailed on the morning of 13 July leaving the Spaniards to continue their survey to the north. Galiano gave Vancouver a letter of introduction to Juan Francisco de la Bodega y Quadra, the Spanish commandant at Nootka Sound, and so with mutual exchange of good wishes and the prospect of meeting again in Nootka Sound the joint survey came to an end. Galiano subsequently took the two schooners through Arran Rapids after he and Valdés had examined it first. After surveying several more inlets, Galiano then also made his way to Nootka Sound, where he was reunited with Vancouver, enabling them to make a final exchange of surveys. Although the joint survey was not an unqualified success, it did demonstrate that surveyors of different nations could work together for their own benefit and for the benefit of all nations.

On their return to Europe only Galiano, of the principal participants, carried out further surveys. In 1802-3 He commanded a scientific and hydrographic cruise to the eastern Mediterranean in the frigate *Soledad*, during which he fixed the geographical positions of numerous places in the Dardanelles, Turkey and Greece as well as surveying several harbours.²² Sadly Galiano was killed in the Battle of Trafalgar in command of the 74-gun ship *Bahama*. In 2005 a symposium was held in Cabra, Galiano's birthplace in Andalucia, to celebrate the 200 anniversary of his death, for which a medal was struck in his honour. (Figure 4 and 5)



Figure 4



Figure 5

Valdes also took part in the Battle of Trafalgar, in command of the 80-gun ship *Neptuno*, when he was severely wounded and his ship wrecked.

In 1810, when in command of the Spanish gunboat flotilla during the siege of Cadiz, Valdes made the acquaintance of William Henry Smyth, who was in command of one of the gunboats. Through Valdes Smyth acquired a copy of Tofiño's *Atlas Maritimo* and subsequently, between 1810 and 1824, carried out extensive surveys in the Mediterranean.²³ Valdes died on 6 February 1835 and was buried in the Pantéon de Marinos Ilustres in Cadiz.²⁴ Vancouver returned to England in poor health and spent his final few years preparing the account of his voyage for publication. He died at his home at Petersham, on the outskirts of London, on 12 May 1798 and was buried in St Peter's Church, Petersham, (Figure 6) a few months before his *Voyage of Discovery to the North Pacific Ocean and round the World*, was published, probably in late August or early September 1798.



Figure 6

Références

1. The date according to Galiano's account was 21 June because Vancouver had not altered his date on the 180E meridian, when crossing the Pacific from west to east. All Galiano's dates are adjusted to agree with Vancouver's.
2. The southern entrance point of Burrard Inlet, leading to the present day port of Vancouver.
3. Andrew David, Felipe Fernández Armesto, Carlos Novi and Glyndwr Williams, eds, *The Malaspina Expedition 1789-1791: The Journal of the Voyage of Alejandro Malaspina*, 3 vols, the Hakluyt Society, London, 2001-4, III, p. 333.
4. W.K. Lamb, ed., *George Vancouver: A Voyage of Discovery to the North Pacific and round the World*, 4 vols, the Hakluyt Society, London, 1984, III, p. 285.
5. John Kendrick, *The Voyage of the Sutil and Mexicana 1792: The last Spanish exploration of the Northwest Coast of America*, Spokane, Washington, 1991, p. 54.
6. Lamb, *Vancouver's Voyage*, p. 592 and n. 1.
7. *Ibid*, p. 94.
8. David et alia, *The Malaspina Expedition*, II, p. 239.
9. Kendrick, *The Voyage of Sutil and Mexicana*, p. 250, adding the three artificial horizons.. Unfortunately the statement by Kendrick that the instruments included a 'Licot pendulum' for use in measuring the acceleration of gravity is incorrect. This instrument was in fact the astronomical or regulator clock by John Ellicott, which Alejandro Malaspina had found in Mexico City.
10. David et alia, *The Malaspina Expedition*, III, pp. 368-70.
11. *Connaissance des temps*, which had been in continuous publication since 1690.
12. Lamb, *Vancouver's Voyage*, p. 593.
13. John Meares, *Voyages made in the Years 1788 and 1789 from China to the North West Coast of America*, London, 1790, f.p. 1.
14. By computing the distance between 'ship stations' from the time taken to sail between them and the speed of the schooner as measured by log line. For the survey methods adopted during the Malaspina expedition and presumably used by Galiano in 1782 see David et alia, *The Malaspina Expedition*, I, pp. 325-7.
15. Galiano named this island Isla de Quema, because sailors from the *Discovery* set it alight.
16. Captain John T. Walbran, *British Columbia Coast Names*, reprint edition, Vancouver, 1971, p. 490.
17. Henry R. Wagner, *Spanish Explorations in the Strait of Juan de Fuca*, Santa Ana, California, 1933, p. 269. Vancouver and Galiano do not appear to have discussed the problem of nomenclature. So when Vancouver decided to name the entrance points of the sound after his sisters, the north-west extremity of Malaspina Peninsula Point Sarah, and the south-east extremity of Cortes Island Point Mary, Galiano named them independently Punta de Sarmiento and Punta de Magellanes, presumably in memory of his survey of Magellan Strait under Antonio Cordoba. As a result the present day names in this archipelago are a happy combination of those bestowed by these two surveyors
18. Named by Vancouver after John Stuart, 3rd Earl of Bute, whose son the Hon. Charles Stuart was a midshipman on board the *Discovery*; hence Stuart Island at the entrance to the inlet; Lamb, *Vancouver's Voyage*, p. 605, n. 8.
19. Lamb, *Vancouver's Voyage*, p. 606.
20. Modern sailing directions indicate that tidal streams of up to 10 knots may be encountered in Yuculta Rapids and up to 9 knots in Arran Rapids, with the duration of slack water very brief and sometimes no more than five minutes; *British Columbia Pilot*, Vol. I, 12th edition, Taunton 2004, p. 289.
21. Malaspina Inlet and Okeover Arm.
22. William Henry Smyth, *The Mediterranean: A Memoir Physical, Historical and Nautical*, London, 1854, p. 349.
23. *Ibid*, pp. 353-4.
24. José Ignacio González-Aller Hierro, 'Officers and Supernumeraries on the Malaspina Expedition', David et alia, *The Malaspina Expedition*, III, p. 356.

Biography of the Author

Andrew David is a retired Lieutenant Commander, Royal Navy, who specialised in hydrographic surveying. He is a senior editor of the much acclaimed *The Charts and Coastal Views of Captain Cook's Voyages*, published in three volumes between 1988 and 1997 by the Hakluyt Society and also a co-editor of *The Malaspina Expedition*, published in three volumes between 2001 and 2004 by the same Society. He is currently editing William Robert Broughton's *Voyage of Discovery to the North Pacific, 1795-1798*, due to be published later this year also by the Hakluyt Society.