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International Cartographic Association (ICA-ACI)

The Emergence of the Admiralty Chart in the Nineteenth Century

Andrew David

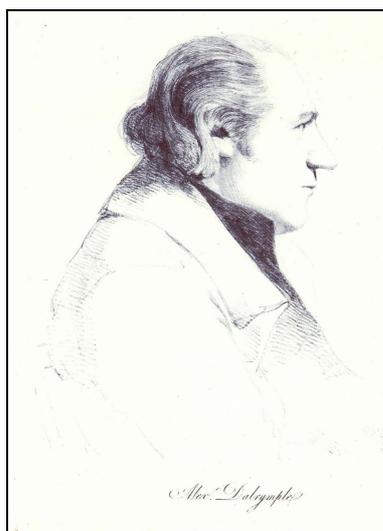
Lieutenant Commander, Royal Navy (retired)

ABSTRACT

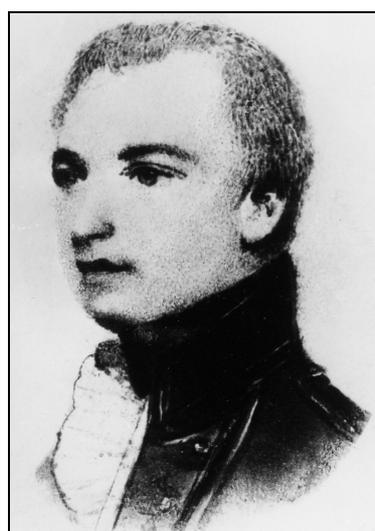
When Admiralty charts were first published in the first decade of the nineteenth century they were only intended for ships of the Royal Navy. This continued until 1821, when Admiralty charts were first put on sale for the public. During the era when Beaufort was Hydrographer (1829-1855) Admiralty charts, based on modern surveys, achieved almost world-wide coverage. Even so, the merchant service continued to rely mainly on the smaller scale blueback charts of private chart publishers, with their numerous insets of ports and anchorages, because they needed fewer charts. But as steam gradually superseded sail and ships could navigate closer inshore, they were gradually forced to use the larger scale Admiralty charts. Finally, in 1929, Imray, Laurie, Norie and Wilson, the sole surviving private chart publisher, were informed that in future royalty would have to be paid for information taken from Admiralty charts, forcing them to specialise on charts for fishermen and yachtsmen

ALEXANDER DALRYMPLE, HYDROGRAPHER 1795-1808

At the end of the eighteenth century Great Britain was the dominant naval power both in Europe and the world. Nevertheless, the Royal Navy had to rely on the charts of private chart publishers or



Alexander Dalrymple



Thomas Hurd



William Parry

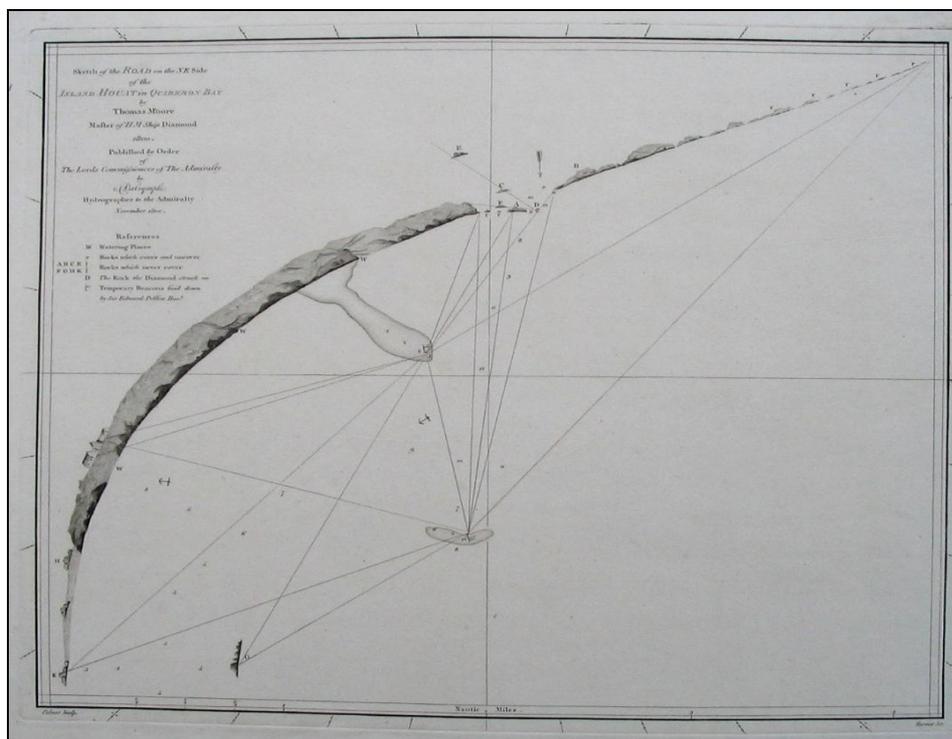


Francis Beaufort

from foreign sources. Indeed there was no specific organization within the Admiralty for carrying out surveys or publishing charts. This hardly changed with the establishment of the Hydrographic Department under Alexander Dalrymple by Order in Council dated 13 August 1795,¹ in which he was instructed ‘with the custody and care of such plans and charts as now are, or may hereafter be, deposited in this office...and selecting and compiling all such information as may appear to be requisite for the purpose of improving the navigation, and for the guidance and direction of the Commanders of Your Majesty’s ships...’ This Order made no mention of merchant ships nor did it give any instructions as to how this information should be promulgated. Dalrymple, however, brought extensive experience to the task, having himself carried out a number of surveys in eastern waters, resulting in his appointment as Hydrographer to the East India Company in 1779, a post he continued to hold simultaneously with his appointment as Hydrographer to the Admiralty.² As Hydrographer to the East India Company Dalrymple had, by 1800, published in excess of 900 charts, mostly plans of harbours and anchorages in eastern waters, usually from information supplied by captains of East Indiamen but also, on occasions, from information supplied by naval officers.

When Dalrymple was appointed Hydrographer to the Admiralty, he brought with him the engraver John Walker, who was first employed copying and reducing plans. A few years later the French cartographer, Élisabeth-Paul-Édouard de Rossel, was employed as a temporary assistant. Rossel had been captured on his way back to France in a Dutch ship with the surveys carried out during d’Entrecasteaux’s voyage. He had been brought to London, where he was entertained to dinner at the Royal Society Club on 27 October 1796 by Dalrymple, which led to his appointment, during which he was employed calculating the astronomical observations made during d’Entrecasteaux’s voyage. Rossel returned to France during the Peace of Amiens,³ and since he later became French Hydrographer, a good liaison between the two Offices was therefore forged. In 1800 Dalrymple acquired a printing press for the Hydrographic Office and recruited two further engravers, who were supervised by Walker under Dalrymple’s directions. Presumably a printer was also engaged to work the press. This enabled Dalrymple to publish in November 1800, the first Admiralty chart, ‘Sketch of the Road on the NE side of the Island Houat in Quiberon Bay 1800’. The reason Dalrymple chose to publish this sketch survey is not clear, as it would appear to have had little strategic value, and I suspect it might have been engraved as a trial run for the newly acquired printing press. It carries a simple imprint under the title, but subsequent Admiralty charts carry the following imprint below the bottom border, ‘Hydrographical Office *Published...by Alexander Dalrymple Hydrographer to the Admiralty*’ to distinguish it from the charts he continued to publish as Hydrographer to the East India Company, which carried the simple imprint ‘Published

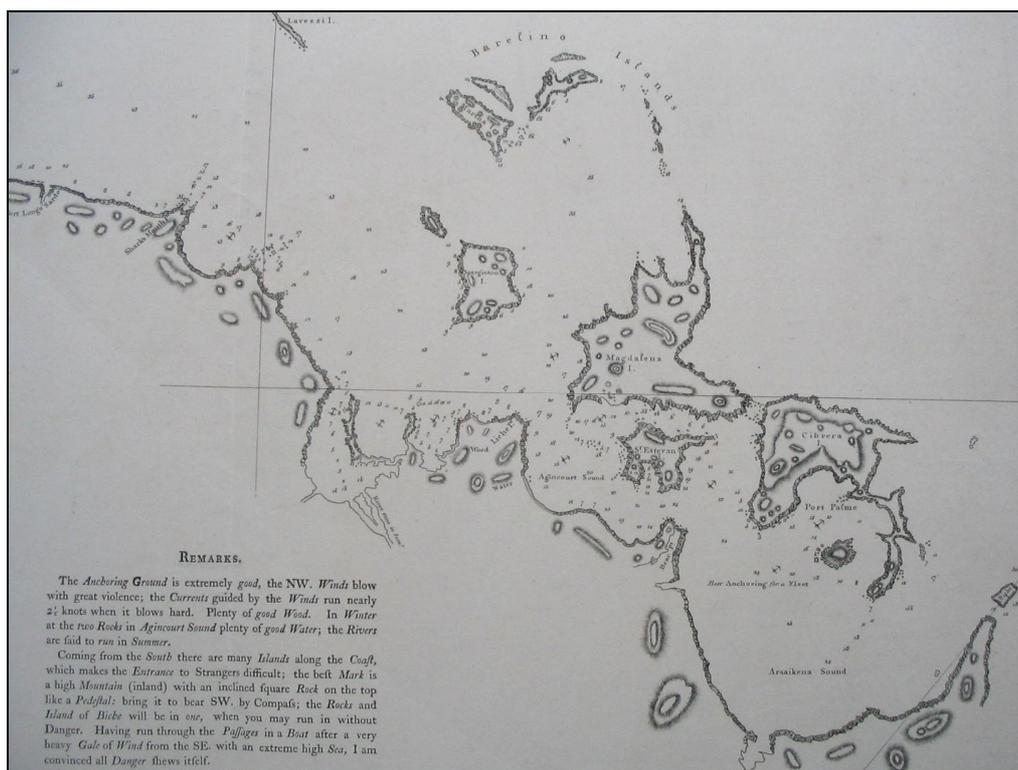
by A. Dalrymple'. Thereafter most of the early Admiralty charts were clearly published to support naval operations, first in the Mediterranean and later in the North Sea and the Channel. They were all based on surveys carried out by naval officers in the course of their normal duties.⁴



The first Admiralty chart

Among the surveys that had accumulated in the Admiralty, Dalrymple found a series of comprehensive surveys of the very highest quality, carried out between 1771 and 1803 by Lieutenant Murdoch Mackenzie as Admiralty Surveyor and his successor Graeme Spence, which covered almost the whole of the south coast of England from the Bristol Channel to the Thames Estuary. With the limited resources available to him, Dalrymple began to get these surveys engraved, having planned a series of charts on a standard format, based on a paper size known as double elephant (or DE)⁵ probably the largest size the printing press could accommodate. This became the standard size, which it still is today, for charts intended for coastal navigation. For instance, Dalrymple's chart 'The North Coast of Kent with Adjacent Channels from Birchington to the entrance to the Thames Surveyed and Navigated by Murdoch Mackenzie Jun^r' measures 26 by 39 inches. For harbour plans and anchorages, etc, DE/2, DE/3, DE/4 and even DE/8 were later used by Dalrymple. Thus two DE/2 charts or four DE/4 charts could be printed simultaneously on a single sheet of DE paper at a vast saving of time and effort.

There were two gaps in Mackenzie's and Spence's surveys. The first was between Rame Head and Exmouth, which was later filled by purchasing copies of 'Chart of the Coast of Devonshire by John Foss Dessiou', when it was published on 13 June 1811 by William Faden. The second gap was between Beachy Head and Dover, which was filled by two charts based on surveys by Spence, Lieutenant John Murray, Captain Johnstone and Mr Tapper. Murray, on his return from Australia in 1804, where he had carried out some surveys, had been appointed in command of the brig *Sorlings* to complete Graeme Spence's survey of the south coast between Beachy Head and Winchelsea. Dalrymple's role in this ambitious scheme of charts, however, has been partly obscured by his decision to issue some of them in proof state to selected ships of the Royal Navy, as he proposed to the Admiralty:



Detail from a 'Chart of the Islands Magdalen and Barelino' published 20 February 1804, depicting Agincourt Sound used as a fleet anchorage by Admiral Nelson in 1803-5.

I beg leave to suggest the propriety of delivering to His Majesty's Cruizers, Impressions of such Plates as are engraved in this Office, not only for the information of the Cruizers, but that thereby an opportunity may be afforded of verifying or correcting the Plates, before they are printed off for general use and for this purpose I have directed a few impressions to be taken off the accompanying list of Plates.⁶

Unfortunately the accompanying list has not survived and only several charts carrying the legend 'Unfinished Proof' have been located. An example of such a proof chart, issued to the fleet, but without this legend, is Mackenzie's chart of the Thames Estuary, referred to above, which was engraved by William Palmer by 1806, as he is known to have died around that year. Although it lacks a publishing imprint, it was unquestionably published by Dalrymple. It also lacks the appropriate symbols in a table titled 'Explanation' though these are shown on a manuscript compilation chart held in the UK Hydrographic Office.⁷ This chart was eventually included in Hurd's Channel Atlas, referred to below, and continued to be issued to the fleet until at least 1818.⁸ Dalrymple's role in this ambitious scheme was further obscured by Hurd, Dalrymple's successor, who, for some unknown reason, changed Dalrymple's name in the publishing imprint of several of these charts to his own name and at the same time amending its year of publication to one when he was Hydrographer. A number of examples are known with both Dalrymple's and Hurd's publishing imprints. In one instance, in a much later pull from a worn copper plate in the author's collection, vestiges of Dalrymple's name can be seen under Hurd's name and the amended date can also be distinguished.⁹ In fact, charts engraved under Dalrymple can be easily distinguished from those engraved under Hurd by their distinctive borders. When Dalrymple began publishing charts as Hydrographer to the East India Company, he dispensed with the usual practise of contemporary chart publishers of criss-crossing their charts with rhumb lines by engraving instead a series of compass indicators around the margin of his borders to indicate the cardinal, half cardinal points, etc, which navigators could join up to form rhumb lines, if they so wished.

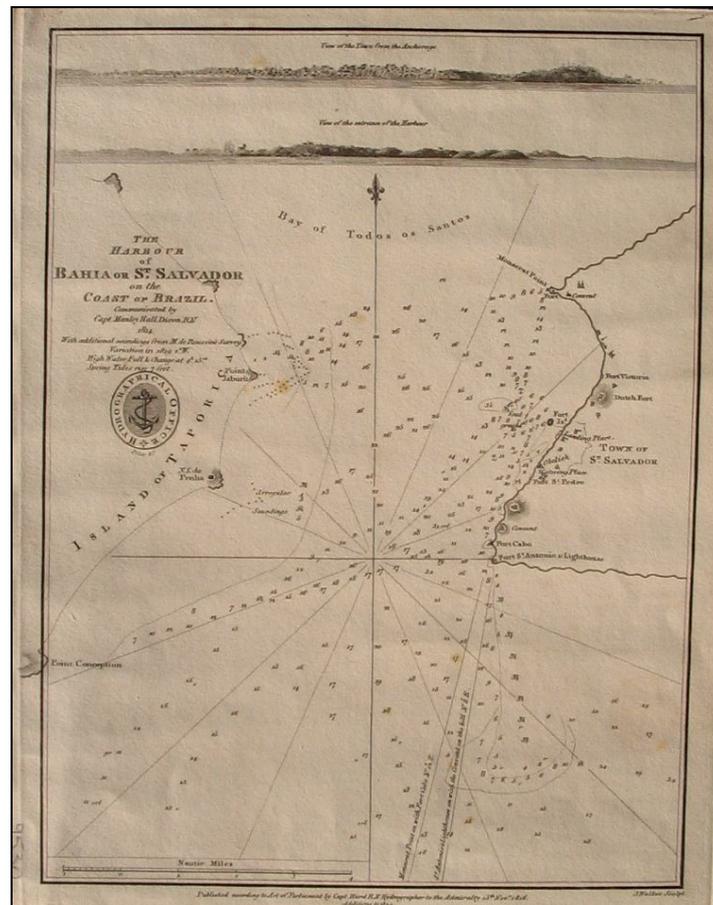
Hurd's charts, on the other hand, do not have these compass indicators and have much thicker borders. At the same time Hurd reintroduced rhumb lines, thus spoiling the much cleaner appearance of Dalrymple's charts. In 1804, Dalrymple offered to provide the Admiralty with copies of his East India charts and views, if they would meet the cost of paper and printing. The offer was accepted and 100 copies were ordered from each of the plates, the printing taking place in the Admiralty. At the rate of 140 impressions a day this occupied the printer and the printing press until October 1806, by which time 81,000 charts had been printed, for which the Admiralty paid Dalrymple £1,000, a considerable saving on the commercial price of £3,462.¹⁰

During Dalrymple's time as Hydrographer to the Admiralty, he was not able to publish sufficient charts to meet the needs of the Royal Navy, which was therefore still dependent on charts produced by private chart publishers, based in London, such as William Faden. As a result the Admiralty appointed a committee of three naval officers with surveying experience (Captains Sir Home Popham, Thomas Hurd and Edward Columbine), known as the Chart Committee, to review all available charts, whether published privately or by the Admiralty, and to select a suitable collection for issue to the fleet. Having examined over 1,000 charts, they selected 200 of the least unsatisfactory, half of which were Admiralty charts, either already published or in the course of preparation and the remainder from private chart publishers. Of these 50% came from William Faden, who had published many surveys by naval officers, such as Captain John Knight.¹¹ Charts so selected carry the legend 'Approved by the Chart Committee of the Admiralty'. Due to disagreements with the Chart Committee and other reasons, Dalrymple was dismissed on 28 May 1808 and Captain Thomas Hurd was appointed Hydrographer in his place. By the time of Dalrymple's dismissal, some 70 Admiralty charts had been published or issued in proof state - a not inconsiderable achievement considering the size of the Hydrographic Office.¹²

THOMAS HURD, HYDROGRAPHER 1808-1823

Thomas Hurd brought with him considerable surveying experience, having spent nine years making a detailed survey of Bermuda. Subsequently he surveyed the approaches to Brest between 1804 and 1806, during Cornwallis's blockade of the port, and in the same period he carried out a detailed survey of Falmouth Harbour and its approaches.¹³ One of Hurd's first acts as Hydrographer was to set about completing Dalrymple's scheme of Channel charts, which was eventually published in atlas form in 1811 as *Charts of the English Channel: Compiled, Selected, & Engraved in the Hydrographical Office...by Capt. Hurd R.N., Hydrographer to...The Admiralty*, which is usually referred to as Hurd's Channel Atlas. Thus there is no acknowledgement of Dalrymple's contribution to this atlas in the title. Dalrymple had lived for his work and he died on 19 June 1808, just over three weeks after his dismissal. In his will Dalrymple left his East India copper plates, which were his personal property, about 635 in total, to the East India Company provided they paid a suitable remuneration for them. However, his offer was refused and they were put up for sale and bought by a London coppersmith for the price of old copper. About 400 of them were then acquired by Hurd from the coppersmith for a small profit, and subsequently the majority of them were republished over the years as Admiralty charts.¹⁴ At the time they were acquired it is probable that the Hydrographic Office still had an ample stock of Dalrymple's East India charts which they had purchased from him in 1804. Those covering places in the South Atlantic and on the route to India were the first which needed to be reprinted. When 66 of these charts were republished between 1810 and 1817, Dalrymple's name and his year of publication were once again erased from the publishing imprint and Hurd's name and the year of republishing substituted. Sometimes the re-engraving was done skilfully, but often Dalrymple's name can still be seen on close inspection. Rhumb lines were once again engraved across the face of these charts and the Hydrographic Office seal was also engraved on all Dalrymple's charts as they were republished. Many of these charts remained in the Admiralty series for most of the nineteenth century and the last of them, 'Plan of Nancowry Harbour from a Survey of Captain Alexander

Kyd', first published in 1792, was not withdrawn until 1959, after being in continuous publication for 167 years.



‘The Harbour of Bahia on St Salvador on the Coast of Brazil’, published 15 November 1816.
A typical Hurd chart, with rhumb lines engraved on it.

In 1809, when Wellington began his campaign to drive the French out of the Iberian Peninsula, there was only a single Admiralty chart covering this important theatre of war.¹⁵ However, in 1812 William Faden published, in a single volume, *España Maritima, or Spanish Coasting*

Pilot...drawn from the Spanish Surveys of Brigadier Don Vicente Tofiño de San Miguel, containing 28 charts and plans, 27 of which were reproduced from Tofiño’s survey, although four had been updated from later British surveys, while ‘The Entrance of the River Tagus’ was based on a survey by William Chapman, Master of HMS *Illustrious*, Captain W.R. Broughton. Faden’s work was so important that he republished it again the following year. It was then republished yet again, in two volumes, under the Hydrographic Office imprint in 1814. The circumstances under which the Hydrographic Office edition was published are not known, but it was presumably under some financial arrangement with Faden, as the copper plates remained in Faden’s possession until 1823.

On 7 May 1814, with the apparent end of the Napoleonic War,¹⁶ Hurd wrote a lengthy report to J.W. Croker, the First Secretary to the Admiralty, pointing out

...the great deficiency of our Nautical knowledge in almost every part of the World but more particularly on the coastline of our own Dominions, and also with the hopes that the present favourable moment for remedying these evils will be made use of, by calling into employment those of our Naval Officers, whose scientific merits point them out as qualified for undertakings of this nature.¹⁷

This report slowly brought fruit and soon several officers were employed carrying out surveys at home and abroad. On 11 July 1809, William Chapman, who had also served under Captain Broughton during the latter's voyage to the North-west Pacific, was appointed to the surveying sloop *Sorlings* as Admiralty Surveyor in succession to Murray, to be paid one guinea a day when actually conducting a survey and half a guinea when in harbour; he was also given an assistant to be paid 2/- a day.¹⁸ Unfortunately this appointment was short-lived as Chapman died on 2 April 1810 and George Thomas, also a Master RN, was appointed Admiralty Surveyor in his place, in command of the ketch *Gleaner*, which was replaced in 1811 by the 121-ton brig *Investigator*. Thomas went on to have a distinguished career as a hydrographic surveyor, working mainly on the east coast of England and in the Orkney and Shetland Islands until his death in 1846. Also in home waters, Commander Martin White was surveying the Channel Islands, extending his surveys later to the English, Irish and Bristol Channels. According to Dawson he 'was the first fairly recognised officer of that rank employed in the Naval Surveying Service'.¹⁹ In Canada, Captain William FitzWilliam Owen was surveying the Great Lakes and the upper waters of the St Lawrence River. They were joined in 1817 by Henry Bayfield, surveying the Gulf of St Lawrence and Newfoundland, and in the same year by Anthony de Mayne, another Master RN, carrying out surveys in the West Indies in the schooner *Kangaroo*. In February 1817, Lieutenant Phillip Parker King, who had little previous experience in hydrographic surveying, was sent out to Australia, to complete Matthew Flinders's survey, with instructions to hire suitable vessels in Sydney for that purpose. In 1818, Captain David Ewen Bartholomew, who had earlier carried out surveys in the entrance to the Persian Gulf, was appointed in command of the *Leven* with orders to carry out surveys on the west coast of Africa. This appointment was short-lived as Bartholomew died in 1821 and Captain W.F.W. Owen was appointed in command of the *Leven* in his place. In her, between 1821 and 1826, Owen surveyed almost the whole of the east coast of Africa and parts of its west coast as well. In the Mediterranean, Lieutenant William Henry Smyth had been carrying out surveys on his own account since 1811, during the Anglo-Spanish reconquest of the Iberian Peninsula, starting at Cadiz and working his way up the south-east coast of Spain. At the other end of the Mediterranean, Commander Francis Beaufort had been employed in 1811 and 1812 in the *Frederickstein* surveying the south coast of Turkey, known in those days as Karamania, which was published in six sheets and five half sheets by the Hydrographic Office in 1819, with a printed memoir the following year.²⁰ By 1815, Smyth had extended his surveys to include the whole of Sicily and Malta and the adjacent islands, which were eventually published by the Hydrographic Office in 1823 in 32 charts and plans. This led Hurd, on 13 September 1815, to submit to Lord Melville, the First Lord of the Admiralty, surveys of the Mediterranean carried out by Smyth,²¹ with the result that his work was at last recognised officially, leading to his appointment in 1817 in command of the *Aid*, with instructions to carry out surveys in the Adriatic and Mediterranean Seas. When the Austrians heard of Smyth's intended surveys in the Adriatic, they proposed a joint survey, realising that the survey could be carried out along the whole of the eastern side of the Adriatic, much of which was still in Turkish hands, because of their respect for the British flag. Smyth therefore visited Naples early in 1818 to negotiate with the Neapolitan and Austrian authorities. As a result four Neapolitan and four Austrian officers joined the *Aid* and the Austrian sloop *Velox* was put under Smyth's command. By the end of 1819, the survey was successfully completed and Smyth was recalled to London.

When Smyth was in Malta in 1816, Captain Pierre Henri Guattier of the French Navy arrived there to measure meridian distances²² so that the various detached French surveys could be connected. Far from resenting what could have been construed as an intrusion on his domain, Smyth went out of his way to offer Guattier every assistance, even helping Guattier to place his instrument on the very spot he had used himself. Not only was the comparison between the two results most satisfactory, it also led to a free exchange of methods and surveys. Smyth and Guattier continued to meet each year to compare results. Thus, when Smyth was recalled to London, he was consulted on the state of the survey of the Mediterranean by Lord Melville. Smyth suggested that much time could be saved if the French and the British avoided surveying the same localities. Melville agreed

and Smyth was sent to Paris to draw up the necessary agreement, in which the French were to continue their surveys in the Greek Archipelago, while Smyth was to concentrate on the western Mediterranean and the north coast of Africa. In 1821, Smyth returned to the Mediterranean in the *Adventure*, as his former command had been renamed, finally returned to England at the end of 1824, leaving Lieutenant Slater in the *Nimble* to finish off some important surveys. By now Smyth had also surveyed the whole of the north coast of Africa from Tripoli to Alexandria from seaward, while at the same time Lieutenant Frederick William Beechey and his brother Henry sketched in the coastline on foot from Tripoli to Derna dressed in Arab clothes.²³

On 12 November 1814, Hurd supplied the British Museum with copies of all charts published by the Hydrographic Office, accompanied by a manuscript listing comprising 103 items.²⁴ The listing represents a slightly greater number of charts, since in several instances, up to three charts had been printed on the same sheet of paper. The listing is also incomplete as does not include any of Dalrymple's East India Company charts, which had been republished by the Admiralty. Hurd may have thought that copies of these charts, with Dalrymple's imprint, had already been presented to the museum by Dalrymple. Nor did it include any of Matthew Flinders's charts of the coast of Australia. Following his release from imprisonment in Île de France, as Mauritius was then called, Flinders was finally able to publish his surveys, between 1 January and 1 June 1814, in 16 plates of charts and four plates of views. The engraving had been supervised by Aaron Arrowsmith and his nephew John, but they were published under the imprint of G. & W. Nichol. However, since the engraving had been paid for by the Admiralty, the plates were passed to Hurd and republished almost simultaneously as Admiralty charts. Thus with the publication of all these surveys, both at home and abroad, the list of Admiralty charts was growing rapidly.

On 12 October 1816, Hurd wrote to John Barrow the Second Secretary to the Admiralty, giving a detailed report on the state of the Hydrographic Office. Only the digest of this letter has survived, which reads:

The Captain in the first place suggests with a view of defraying a part of the expenses of the department that after a plate has been engraved and a sufficient number of charts struck off for Naval Uses, that the remaining impressions be disposed of at a moderate price for the benefit of the Trading Interest and the amount of sales carried to an office account in aid of its annual expenses: and secondly submits the expediency of selecting a certain number of officers well acquainted with the science of maritime surveying and forming them into a distinct and separate corps something similar to that of the Engineers of the Army and transmits a list of officers entitled to consideration for such employment.²⁵

Such a corps was rapidly established and on 7 January 1817, the Board of Admiralty fixed the rate of pay for surveying officers at 20/- per day for commanders and 15/- for lieutenants and masters, which was in addition to their full pay.²⁶ Thus a corps of dedicated officers, known as the Surveying Service, was established. This was followed on 9 January 1819, by a further order from the Board, fixing the rate of survey pay for post captains at 20/- a day and for assistant surveyors at 5/- a day.²⁷

Hurd realised that if he was to produce adequate charts of European waters he had to obtain charts published by other Hydrographic Offices, who would be much more willing to provide them, if they knew that they were not solely for the use of ships of the Royal Navy. Therefore on 30 December 1819, with the approval of the Board of Admiralty, Hurd wrote to Rear Admiral Lövenörn, the Danish Hydrographer, suggesting the mutual exchange of hydrographic information.²⁸ Lövenörn responded by forwarding two packages of charts, which were received on 18 June 1821. Lövenörn followed this up in 1825 by sending the Hydrographic Office charts of the west coast of Greenland,²⁹ while his successor Commodore Fabricius, wrote again the following year about the continuing exchange of hydrographic information.³⁰ An unrecorded exchange of hydrographic information with Spain must have taken place a few years earlier since, between 1817 and 1819, Hurd published seven charts of South America and one of Acapulco, based on

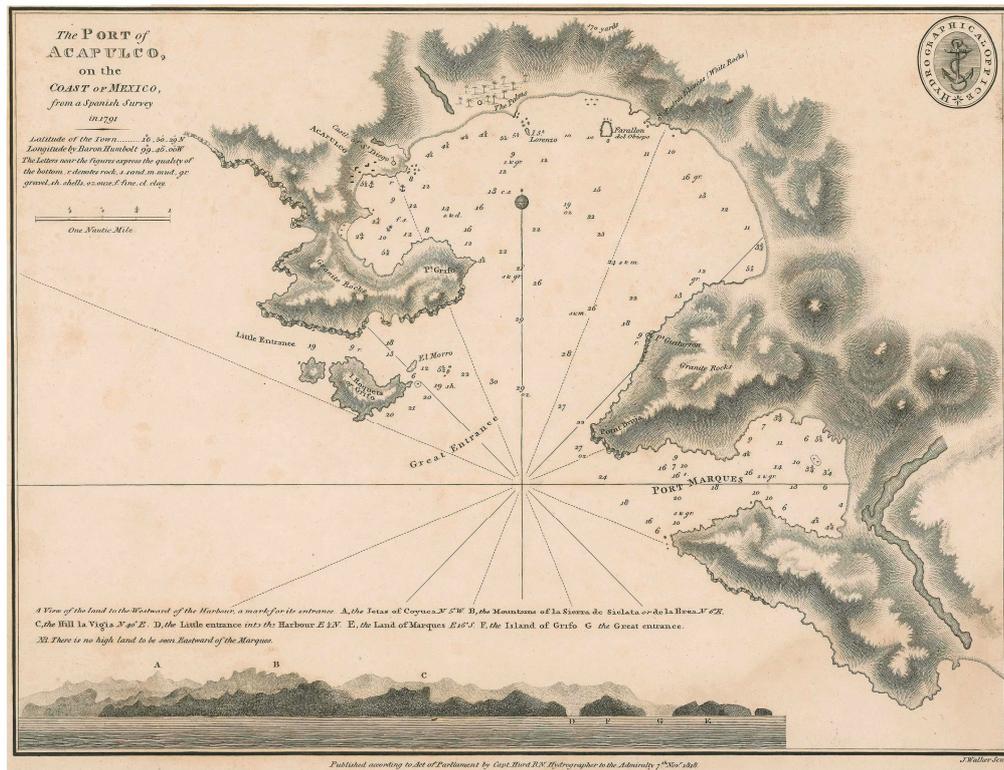
Spanish surveys. In addition there is a bound atlas of 42 Admiralty charts held in the Museo Naval in Madrid with the annotation on the first page, 'Regalada a esta Dirección Hidrográfica por el Almirantazgo de Londres y recibido en 19 de octubre de 1817'.

Permission to sell charts to the public took a little longer, but in 1821 Hurd finally received permission from the Board of Admiralty to sell charts to the general public, submitting to the Board a printed catalogue, giving the price for each chart. Unfortunately only a single page from this catalogue has survived³¹ and so the number of Admiralty charts in publication at this time is not known. Their numbers, however, received a significant boost in 1823, when William Faden, shortly before he retired later that year, sold to the Admiralty for £1,000,³² 61 of his copper plates and two half plates together with the 28 copper plates for his *España Marítima*.³³ A preliminary study shows that by 1825 the majority of these plates had been republished by the Hydrographic Office, thus adding to the corpus of Admiralty charts. These included Dessiou's 'Chart of Part of the Coast of Devonshire' referred to earlier, which was republished on 2 February 1826 with a completely new title and all reference to Faden and Dessiou deleted; a chart of the North Atlantic, depicting Nelson's track across the Atlantic in pursuit of the French and Spanish fleets prior to the Battle of Trafalgar; a chart of the South Atlantic, a chart in two sheets of the River Plate based on surveys carried out by Mr John Warner, Master of HMS *Nereus*, Captain Peter Heywood;³⁴ a chart of the West Indies in four sheets and a chart of the North Sea by Dessiou in six sheets.³⁵ Several of the charts from the *España Marítima* were also republished in due course as Admiralty charts.³⁶ Some of these charts, when published in the Admiralty series, carry the legend 'Bought of Faden and published at the Hydrographical Office of the Admiralty May 1823'.³⁷ Other Faden charts can only be identified by the price being added above or below Faden's title and, from 1839, by the chart number being engraved bottom right outside the border. When necessary, some of the charts were updated from information held in the Hydrographic Office before being republished. For instance Faden's chart of the West Indies, originally published on 13 June 1811, was republished on 2 February 1826 with a greatly amended title to show that it was now based on surveys by Anthony de Mayne and the latest Spanish charts and had been adjusted from the latest astronomical observations.

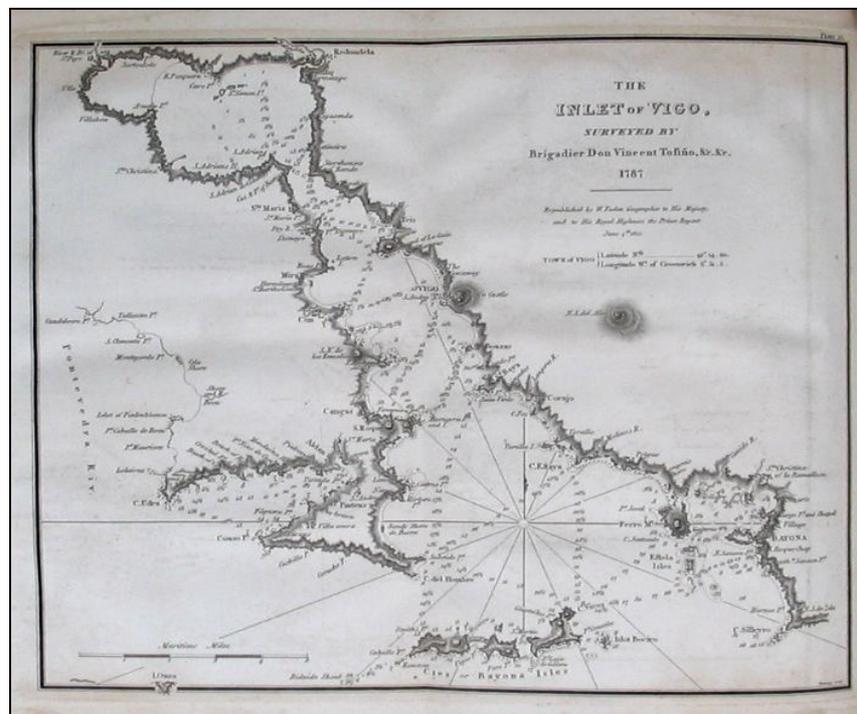
Much had therefore been achieved by the time of Hurd's death on 29 April 1823. *A Catalogue of Charts, Plans, & Views, printed at the Admiralty Office, 1825*, the first surviving catalogue, lists 754 charts and sheets of views - a considerable increase during Hurd's tenure of office. The catalogue was divided into XVIII sections, the charts in each section being offered bound in stiff marbled paper covers, with leather back or separately. Copies of *España Marítima* were offered for sale for £1:1:0.

EDWARD PARRY, HYDROGRAPHER 1823-1829

On Hurd's death the post of Hydrographer was not filled immediately and John Walker was left in charge of the office until 1 December 1823, when the Arctic explorer Captain Edward Parry was appointed Hydrographer. Parry only accepted the appointment on the understanding that it would not preclude him taking part in further expeditions to the Arctic. An important addition to the office staff at this time was Lieutenant Alexander Bridport Becher, an experienced hydrographic surveyor, who was appointed to the office in May 1823 to arrange and catalogue the vast number of documents that had accumulated there, consisting of manuscript surveys and printed charts, etc.³⁸ This task took him three years, after which he was given a permanent appointment to the office.³⁹ Parry duly sailed on his second expedition to the Arctic in May 1824, prior to which he must have spent much of the intervening five months supervising the preparations for this expedition. He returned in November 1825, but was absent again in the Arctic from April to October 1827. During his absences Walker battled as well as he could against the efforts of John Croker, the First Secretary to the Admiralty, to reduce the establishment of the office. Croker was particularly against the presence of naval officers drawing their fair charts in the office, forcing both Captain Peter Heywood and Captain Smyth from their tables, the latter taking all his



‘The Port of Acapulco on the coast of Mexico from a Spanish survey in 1791’, published 7 November 1818, one of Alexandro Malaspina’s surveys



‘The Inlet of Vigo’, plate 16 in William Faden’s *España Marítima*, republished as an Admiralty chart in 1823

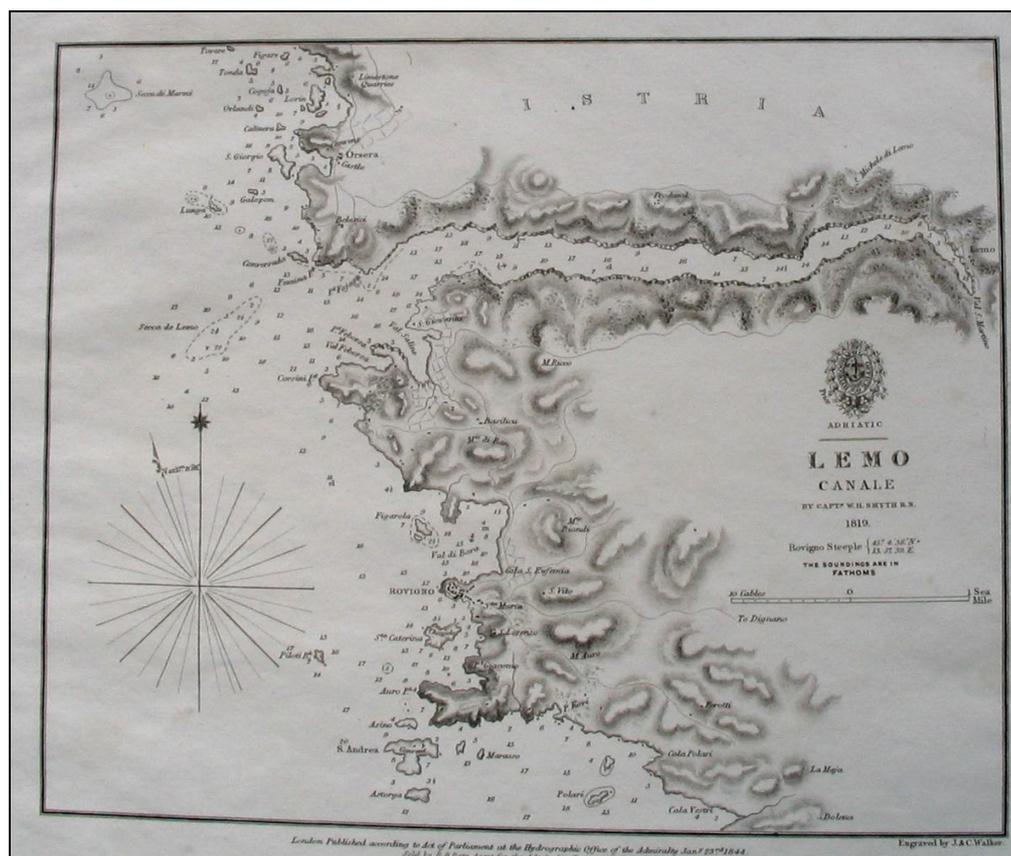
Mediterranean surveys with him.⁴⁰ On 7 June 1827, during one of Parry's absences, His Royal Highness the Duke of Clarence, then Lord High Admiral of the United Kingdom and later King William IV, began to take a great interest in the Hydrographic Office, directing that six extra draughtsmen should be employed temporarily to clear the arrears that had accumulated there and that weekly reports of their work should be made to him.⁴¹ Another person who proved to be a great help to the Hydrographic Office was the Spanish naval officer Felipe Bauzá, who had been forced to flee from Madrid for political reasons from his position as director of the Spanish *Depósito Hidrográfico*. Bauzá arrived in London in December 1823, bringing with him a considerable collection of important hydrographic manuscripts, some relating to the Malaspina expedition, in which he took part. These were examined in the Hydrographic Office, presumably by Becher, who was conversant with Spanish. As Bauzá claimed that these manuscripts were his personal property, they were returned to him. Bauzá had been elected a foreign member of the Royal Society in 1819 and so Parry took the opportunity to formally introduce him to the Society. Bauzá also formed close links with Walker and Becher, and from time to time he kept passing useful information to the Hydrographic Office from his collection.⁴² Bauzá soon provided a useful contact between the Hydrographic Office and Don Martín Fernández Navarrete, the interim director of the *Depósito Hidrográfico*. The exchange of hydrographic information with foreign hydrographic offices was still not entirely satisfactory and on 18 January 1828 Parry proposed writing to the French, Spanish, Russian, Danish, Swedish and Neapolitan governments to remedy this.⁴³ The position of Hydrographer, however, did not suit Parry and in April 1829 he resigned to take up a more active appointment in Australia as Commissioner of the Australian Agricultural Company, based on Port Stephens, 100 miles to the north of Sydney.

FRANCIS BEAUFORT, HYDROGRAPHER 1829-1855

Francis Beaufort succeeded Parry as Hydrographer on 14 May 1829. With the appointment of Beaufort, John Walker took the opportunity to retire, after serving in the Hydrographic Office for over 35 years. He died shortly afterwards on 26 July 1831 and was succeeded in the Hydrographic Office by his second son Michael.⁴⁴ Bauzá also took the opportunity to write to Navarrete, who by now had been appointed Director of the *Depósito Hidrográfico*, informing him that Beaufort had been appointed Hydrographer in succession to Parry. Navarrete at once wrote to congratulate Beaufort, forwarding at the same time 72 charts and publications, many based on the Malaspina expedition.⁴⁵ From this collection Beaufort was able to publish a series of plans of ports in Cuba and Puerto Rico and also a number of charts in South America and the Philippines. In the Mediterranean a chart of Madri Port on the east coast of Greece and another of St Nicolas Port on the island of Zea were also published from this collection. The following year Beaufort reciprocated by sending Navarrete copies of all charts the Director had marked in a catalogue Beaufort had sent him, and so the exchange of charts continued between the two offices.⁴⁶ One of the manuscripts that Bauzá presented to the Hydrographic Office was one that related directly to Malaspina's voyage.⁴⁷ In 1793, Malaspina approached New Zealand's South Island in order to carry out gravity observations there. Having made the coast off Doubtful Sound (Cook's Doubtful Harbour), Malaspina sent Bauzá inshore to see if it provided a suitable site for the proposed observations. However, bad weather forced Malaspina to abandon his plan, but not before Bauzá had made a sketch survey of the sound, on which he named various features. Beaufort published this survey in 1840, with three other plans from Cook's and Vancouver's voyages, as Admiralty chart No 1281, on which Bauzá's names are retained with English geographical terms. Thus the names Bauzá Island, Malaspina Reach and Pendulo Reach on modern New Zealand charts and maps can be directly linked to Bauzá's survey.

On 2 September 1829, Beaufort wrote to Admiral Rossel, by now the French Hydrographer, thanking him for a package of charts from Captain Hell 'who has left a most pleasing impression

on the minds of everyone here who had the happiness of being acquainted with him'. At the same time Beaufort acknowledged the receipt of charts from the French Hydrographic Office, mentioning that the Hydrographic Office was engraving Roussin's chart of Brazil.⁴⁸ On 15 October 1830, the Russian Captain Count F. Lütke forwarded copies of charts of Novoya Zembla, which he had explored in 1821-4, but no use appears to have been made of them.⁴⁹ One of Beaufort's first tasks on becoming Hydrographer was to persuade his friend Smyth, who was a skilled draughtsman and artist, to resume working on his surveys, which resulted in a steady flow of fair charts reaching the office, enabling a further series of charts of the Mediterranean to be published. As a result, on 14 May 1839, Beaufort was able to record his appreciation of Smyth's contribution to the survey of the Mediterranean, which included 170 plans of ports and roadsteads, 25 charts either quite new or materially corrected, as well as a number of navigational views.⁵⁰



'Lemo Canale by Capt'n W.H. Smyth, 1819', but not published until 23 January 1844.

While the Hydrographic Office under Beaufort was publishing an increasing number of charts, the East India Company was still conducting surveys in the Persian Gulf and the Indian sub-continent, which were published by James Horsburgh, who had been appointed Hydrographer to the East India Company in 1810, on the death of Dalrymple. Horsburgh remained in post until his own death in May 1836, aged 74, when the post of Hydrographer to the East India Company was allowed to lapse, resulting in a period of reduced activity afloat by the company. At the same time the Hydrographic Office was publishing charts of the same waters. For instance, the 1825 *Admiralty Chart Catalogue* listed 91 charts for the Red Sea, the Persian Gulf and the coasts of Burma and for the navigation to China, although admittedly most of these were republished from the Dalrymple copper plates. Thus by the time Beaufort took over as Hydrographer, the Hydrographic Office could boast a world wide chart coverage although not as comprehensive as he would have liked. Where there was no national hydrographic office or no capability of carrying out surveys in their own waters Beaufort usually sought permission to carry out such surveys, such

as the surveys carried out in South American waters between 1826 and 1835 by Phillip Parker King and Robert FitzRoy in the *Adventure* and the *Beagle*.

On 3 March 1832, Beaufort took the opportunity of the publication of the first issue of the *Nautical Magazine* of opening a correspondence with Admiral Adam Krusenstern, the Russian Hydrographer, by sending him a copy.⁵¹ This journal, edited by Becher, was founded with a grant from the Admiralty. From the first issue it was used as a method of promulgating new information affecting Admiralty charts and publications as well as containing other important hydrographic and general nautical information. While the correspondence with Krusenstern was carried on in the friendliest of terms in English (Krusenstern had served in the Royal Navy between 1793 and 1796), nothing very concrete seems to have been the result. However, on 15 September 1834 Krusenstern promised to send Beaufort the results of the latest Japanese surveys⁵² and on 16 October 1836 he forwarded information for the correction of charts of the Baltic.⁵³

Beaufort served as Hydrographer for 26 years with great distinction, during a period of considerable change. In particular steam propulsion was beginning to replace sail both for naval and merchant ships. At the conclusion of the Beaufort era there were ten surveys in hand in home waters and eleven abroad.⁵⁴ In 1830 there were 852 charts and 81 sheets of views in publication, the latter mainly of harbour approaches in the Far East taken from Dalrymple's copper plates. By 1839 this had increased to 1,116 charts and 86 sheets of views, covering the whole world, though some coverage was still rather sketchy. For instance there were only three charts covering the whole of the east coast of the United States, with no large scale charts of the major ports such as New York. Perhaps this was because ships of the Royal Navy were unlikely to use these ports. The coast of Norway was equally badly served, being covered by a single chart No 94, sheet 2 of Faden's chart of the North Sea, which had been bought in 1823. This was partly due to the fact that it was not until 5 May 1839 that Beaufort received from M. Haresteen, the recently appointed Norwegian Hydrographer, copies of charts 2, 3 and 4 of the Norwegian coast, published under his direction.⁵⁵ In home waters, in spite of the surveys by George Thomas, the Shetland and Orkney Islands were still covered by chart No 93, sheet 1 of Faden's chart of the North Sea, although by then a number of Thomas's surveys had been published. In the 1839 catalogue charts were allocated numbers for the first time, which were engraved outside the bottom right margin. In 1848 55,220 charts were printed of which 22,819 were sold to the public⁵⁶ and in 1855 1,981 charts were in publication.⁵⁷ Thus the publication of high quality charts accelerated during the Beaufort era. On Beaufort's retirement, Captain John Washington, his successor, remarked that one of his great achievements was 'the raising of the Hydrographic Office of England to a far higher level than any similar institution in Europe'.⁵⁸

POST BEAUFORT

When Washington took over as Hydrographer, the Admiralty chart was well established, though in eastern waters charts the East India Company continued to publish its own charts. Following the 1857 Indian mutiny all the East India Company's responsibilities were passed to the British Government. In consequence, the whole of the hydrographic surveying activity of the Government of India was transferred to the Hydrographic Office in 1861, accompanied by the transfer of original surveys, copper plates and published charts. As a result a number of Charts published by Horsburgh became Admiralty charts. Such an example was Horsburgh's chart of the island of Socotra (now Suqurá) based on a survey by Lieutenants S.B. Haines and J.R. Wellsted of the Indian Navy. Originally published on 1 August 1835, it was republished by the Hydrographic Office as chart No 5, retaining the publishing imprint of James Horsburgh and remaining in publication until superseded by a metric version on 11 December 1987.

Competition from the private chart publishers was still considerable. When Admiralty charts were first offered for sale in 1821, this had little impact for many years on the sale of privately

published blueback charts.⁵⁹ The Merchant Navy preferred these charts because of their relatively small scale, with many insets of important ports. This meant that even though these charts were as much as six or seven times more expensive than Admiralty charts, a merchant ship needed to carry fewer of them. Since the Hydrographic Office allowed commercial publishers to use modern survey material published in Admiralty charts, they were reasonably up to date when first printed, but there was no method for keeping them up to date once they had been sold. On the other hand, the Hydrographic Office had begun publishing Notices to Mariners for correcting charts in 1834 and by 1861 the notices quoted the charts numbers affected. They were distributed to chart agents so that charts in their hands could be corrected before they were sold. By the middle of the nineteenth century there were only three independent chart publishers left, namely Imray, Laurie and Norie and Wilson. At about the same time the increasing use of steam propulsion, enabling vessels to navigate much closer to land, meant that merchant vessels now required larger scale charts, making the blueback chart with little coastal information inadequate. This resulted in the gradual switch from blueback to Admiralty charts, forcing the three independent publishers to amalgamate, so that by the end of the nineteenth century the supremacy of the Admiralty chart was assured. Finally in 1929 the Hydrographer wrote to Imray, Laurie, Norie & Wilson informing them that in future permission must be sought and royalty paid before any information could be taken from Admiralty charts.⁶⁰ This was a major but not a fatal blow as although the firm was forced to stop publishing its blueback charts, it survives to this day, specialising in fishing and yachting charts.

ENDNOTES

¹ Vice-Admiral Sir Archibald Day, *The Admiralty Hydrographic Service 1795-1919*, London, 1967, pp. 334-5.

² For details of his career see Howard T. Fry, *Alexander Dalrymple and the Expansion of British Trade*, London, 1970.

³ Fry, p. 262.

⁴ See Andrew David, 'Admiral Nelson, Alexander Dalrymple and the early years of the Hydrographical Office', *IMCoS Journal*, No 102, Autumn 2005, pp. 5-19.

⁵ Although the trade now knows double elephant as a size between 36 by 24 inches and 46 by 31 inches, Dalrymple soon adopted 38 by 25 inches as DE; Day, p. 51, n. 1. A typical size for a modern coastal sheet is 28 x 41 inches.

⁶ The National Archives [TNA], ADM 1/3522, Dalrymple to Nepean, letter dated 27 May 1803.

⁷ United Kingdom Hydrographic Office [UKHO], H 84.

⁸ A copy of this chart in the collection of the author carries the watermark 'J Whatman 1818'. See also Andrew David, 'Is it Hurd's or Dalrymple's Channel Atlas?', *The Map Collector*, No. 72, Autumn 1995, pp. 20-4.

⁹ The chart was Hurd's survey of Falmouth Harbour, which originally carried a publishing date of 1st Oct^r 1807, which was re-engraved as 1st Oct^r 1808 by which time Hurd had been appointed Hydrographer; David, 1995, p. 21.

¹⁰ TNA, ADM 1/3522, Dalrymple to Marsden, letter dated 31 October 1806.

¹¹ Ibid; see also Susanna Fisher, *The Makers of the Blueback Charts*, St Ives, 2001, pp. 10-11.

¹² For a full list see Andrew David, *A Catalogue of Charts and Coastal Views published by Alexander Dalrymple 1767-1808... and their subsequent history (1767-1959)*, typescript, 1990, with copies in major research libraries. See also Andrew David, 'Alexander Dalrymple and the Emergence of the Admiralty Chart' *Five Hundred Years of Nautical Science 1400-1900*, The National Maritime Museum, Greenwich, 1981, pp. 153-164.

¹³ Andrew C.F. David, 'Thomas Hannaford Hurd' *Oxford Dictionary of National Biography*, Oxford, 2004.

¹⁴ Until recently the UK Hydrographic Office retained about 270 of Dalrymple's East India copper plates. They have now been transferred to the Admiralty Library, Portsmouth, the British Library and several other institutions.

¹⁵. 'A Chart of the Coast of Spain from Cape Corrobedo...to River Miño...from the Atlas Maritimo de España by Don Vicente Tofiño de San Miguel', published 11 September 1801.

¹⁶. Peace negotiations were in progress, but Napoleon's escape from Elba was to prologue the war for another year.

¹⁷. TNA, ADM 1/3459. For the full report see Day, p. 27.

¹⁸. Ibid, ADM 2/156, 11 July 1809.

¹⁹. L.S. Dawson, *Memoirs of Hydrography*, 2 vols, Eastbourne, 1885 (Facsimile edition London, 1969), I, p. 52.

²⁰. *Memoir of a Survey of the Coast of Karamania*. Not to be confused with Francis Beaufort, *Karamania, or a Brief Description of the South Coast of Asia Minor and of the Remains of Antiquity*, London, 1817.

²¹. UKHO, LB 1, pp. 20-1.

²². Measuring differences in longitude between various places by chronometer.

²³. For an account of Beaufort's and Smyth's surveys see Andrew David, 'British Hydrographic Surveys in the Mediterranean in the early years of the Nineteenth Century', *International Hydrographic Review*, Vol. 6, No 3 (New Series) November 2005, pp. 10-24 and also William Henry Smyth, *The Mediterranean: A Memoir Physical Historical and Nautical*, London, 1854.

²⁴. British Library, maps C.1.c.15.

²⁵. TNA, ADM 12/179, cut 57; reprinted in Day, p. 27.

²⁶. UKHO, LB 1, 1st page of index.

²⁷. Ibid.

²⁸. Ibid, LB 1, pp. 260-1.

²⁹. Ibid, letters prior to 1857, L396.

³⁰. Ibid, F 239 and 240.

³¹. Found by Adrian Webb in the chart collection of the Wyndham family and estate papers in the Somerset Record Office, Taunton.

³². TNA, ADM 17/28 (contingent expenses of the Hydrographical Office from 1 January to 29 April 1823), payment on 3 June 1823.

³³. UKHO, MLP 196.

³⁴. Heywood was a midshipman under Bligh at the time of the mutiny on the *Bounty*. He remained on board and was brought back to England and tried by court martial for mutiny and convicted. On being granted a free pardon he rejoined the Navy and had a distinguished career during which he carried out a number of notable surveys.

³⁵. The six copper plates of this chart have survived are now on display in the annexe to the Ritchie building in the UK Hydrographic Office.

³⁶. Before these copper plates were destroyed several impressions were taken from 21 of them, which are now held in 'Pulls from Cancelled Plates', Folio D.

³⁷. For example 'The Bay of Algeziras or Gibraltar' which was published as chart 143 when copies of *España Maritima* were withdrawn from sale.

³⁸. His catalogue, known as catalogue A, is still in constant use in the Hydrographic Office.

³⁹. A brief account of Becher's career is given in Dawson, *Memoirs of Hydrography*, II, pp. 48-9.

⁴⁰. Admiral G.S. Ritchie, *The Admiralty Chart: British Naval Hydrography in the Nineteenth Century*, a new edition, Bishop Auckland, 1995, p. 177.

⁴¹. Day, p. 36.

⁴². For an account of Bauzá exile in London see Andrew David, 'Felipe Bauzá and the British Hydrographic Office 1823 - 1834, Mercedes Paula Banquero and Antonio Orozco Acuaviva (eds), *Malaspina '92: Jornadas Internacionales*, Cádiz, 1994, pp. 235-42. See also Ursula Lamb, 'The London Years of Felipe Bauzá: Spanish Hydrographer in Exile, 1823-1834', *The Journal of Navigation*, Vol. 34, No 3, pp. 319-40.

⁴³. UKHO, MB 1, pp. 130-2, 140-1 and 174.

⁴⁴. Dawson, I, pp. 103-4.

⁴⁵. UKHO, Letters prior to 1857, N 21.

⁴⁶. Andrew David, 'Anglo-Spanish Cooperation in Hydrography, Navigation and Nautical Astronomy, 1788-1834', Luisa Martín-Merás (ed.) *Navigare Necesse Est: Estudios de Historia Marítima en Honor de Lola Higuera*, Gijón, 2008.

⁴⁷. 'Croquis del Puerto Dudoso...por el Alferez Dⁿ Felipe Bauzá'; UKHO, G54.

⁴⁸. UKHO, LB 2, pp. 348-50. Admiral Roussin surveyed the coast of Brazil between 1818 and 1820.

⁴⁹. Ibid, Letters prior to 1857, L176.

⁵⁰. Ibid, MB 3, p. 120.

⁵¹. Ibid, LB 4, p. 6. In the prospectus to the first issue of the journal in March 1832, it was stated that its contents would be arranged under four headings, namely: Hydrography, Voyages, Navigation and Nautical Miscellany. Krusenstern would have been particularly interested in an account of the voyage of the *Blossom* to the Pacific and Bering Strait in this issue; pp. 28-34, 79-89 and 138-45. The introduction (pp. 3-9) was a translation of a Spanish MS written by Felipe Bauzá.

⁵². Ibid, Letters prior to 1857, K 148. It is not known if these were ever sent.

⁵³. Ibid, Letters prior to 1857, K 145.

⁵⁴. Day, p. 67.

⁵⁵. UKHO, Letters prior to 1857, H 129.

⁵⁶. Ibid, p. 52.

⁵⁷. Ibid, p. 49.

⁵⁸. Day, p. 67.

⁵⁹. So called from the blue paper backing used to strengthen unbound charts.

⁶⁰. Fisher, p. 119.

BIOGRAPHY

Andrew David, born in 1924, is a retired Lieutenant Commander, Royal Navy, who specialised in hydrographic surveying, carrying out independent surveys off the west coast of England and Wales in 1960-1 in command of HM Surveying Launch *Medusa*. From 1962-1985 he served in the UK Hydrographic Office, editing Admiralty sailing directions, during which he produced a catalogue of the office's holdings of manuscript logs, journals, correspondence, etc, thereby creating a personal interest in the history of the UK Hydrographic Office and voyages of exploration. He has presented papers at historical conferences in the UK and abroad, many of which have been published. He has served as vice president of the Hakluyt Society and in 2006 was awarded their silver medal. His principal publication has been as senior editor of the Society's *The Charts and Coastal Views of Captain Cook's Voyages*, published in three volumes in 1988, 1992 and 1998. He was also co-editor of the Society's *The Malaspina Expedition, 1789-1794: The Journal of the Voyage of Alexandro Malaspina*, published in three volumes in 2001, 2003 and 2004.