

Article



British Hydrographic Surveys in the Mediterranean in the early years of the Nineteenth Century

By Andrew David



Abstract

In the aftermath of the Napoleonic Wars there was a resurgence of hydrographic activity around the world. In the Mediterranean the British effort was spearheaded by William Henry Smyth with Francis Beaufort also making a considerable contribution. Smyth also carried out joint surveys with Neapolitan and Austrian surveyors in the Adriatic and co-operated with the French Captain Pierre-Henri Guattier, in an early example of international co-operation in the field of hydrography.



Résumé

Les guerres napoléoniennes ont eu pour corollaire la résurgence des activités hydrographiques à travers le monde. En Méditerranée, les travaux britanniques ont été conduits par William Henry Smyth avec la remarquable contribution de Francis Beaufort. Smyth a également effectué des levés conjoints avec les hydrographes napolitains et autrichiens, dans l'Adriatique, et a coopéré avec le capitaine de vaisseau français Pierre-Henri Guattier, un des premiers exemples de coopération internationale dans le domaine de l'hydrographie.



Resumen

En las condiciones que resultaron de las Guerras Napoleónicas hubo una resurgencia de actividad hidrográfica en el mundo. En el Mediterráneo, el esfuerzo británico fue encabezado por William Henry SMYTH, habiendo efectuado también una considerable contribución Francis BEAUFORT. SMYTH también llevó a cabo levantamientos conjuntos con los hidrógrafos napolitanos y austriacos en el Adriático y cooperó con el Capitán de Navío francés Pierre-Henri GUATTIER, en un prematuro ejemplo de cooperación internacional en el campo de la hidrografía.

When the British Hydrographic Office was established in 1795, the task of Alexander Dalrymple, the first Hydrographer to the Admiralty, was at first merely concerned with cataloguing the numerous surveys held in the Admiralty and deciding which were suitable for publication. There was no regular programme of surveying and the occasional major surveys that were undertaken were initiated by the Admiralty and not by the Hydrographer. In consequence, at the start of the nineteenth century, most of the surveys of the Mediterranean reaching the Hydrographic Office were the work of enthusiastic but unskilled naval officers carried out during the course of their normal duties. Nevertheless, Dalrymple was able to publish a number of Admiralty charts to support the British fleet in the Mediterranean under the command of Vice-Admiral Lord Nelson (David 2005). No regular coastal surveys had been carried out in the Mediterranean, and the geographical positions of few places there were accurately known. In 1814, Captain Thomas Hurd, Dalrymple's successor as Hydrographer to the Admiralty, in a lengthy report to J.W. Croker, the Secretary of the Admiralty, on the state of hydrography pointed out that in the Mediterranean

...our knowledge is very limited, particularly on the Southern Coasts thereof, from Algiers to Alexandria, and from thence along the Syrian Shore to the Gulf of Scanderoon [İskenderon Körfezi], where Captain Beaufort's late survey ended. Likewise of the Coast and Islands in the Archipelago, together with the whole Eastern Side of the Adriatic, of which Sea our ignorance is so great as to leave us without any information as to the real extent or width of its entrance from the Mediterranean (Day 1967).

In a further report to Croker on 26 June 1816, Hurd requested that Commander William Henry Smyth, who on his own initiative had been carrying out surveys in the Mediterranean since 1809, should be furnished with a ship (UKHO Letter Book), thus setting his survey work on a much more official basis. As a result, by 1825, when Smyth finally returned to England, most of the deficiencies pointed out by Hurd had been made good, mainly by the efforts of Smyth and his subordinates. Smyth added so much to the knowledge of the area that he was known in later years as 'Mediterranean Smyth'.

Captain Francis Beaufort, however, also made an important contribution. In 1811 Beaufort was cruising in the Greek Archipelago, in command of the frigate *Frederickstein*, when he was ordered to survey the uncharted southern coast of Asia Minor, which was known in those days as Karamania. Beaufort was a good choice as he had already carried out a number of excellent surveys, chiefly in South America, as well as being skilled at astronomical observations. Having first obtained the necessary *ferman* or passport from the Porte in Smyrna, present day Izmir, Beaufort started his survey at Makry [Kurtoğlu Burnu], a point on the Turkish mainland about 40 miles eastward of Rhodes, by fixing its geographical position. An observatory was set up ashore where latitude was obtained using an excellent circle by Troughton and longitude by observing the eclipses of Jupiter's satellites with a two-inch reflecting telescope. Longitude was then carried forward to the next observing station by *Frederickstein's* three chronometers. Latitude was carried forward by further observations ashore with Troughton's circle, or by observation on board by sextants. Having fixed the position of Makry, Beaufort commenced his survey in an eastward direction, landing at frequent intervals to delineate the coastline, while the frigate's boats, under sails or oars, fixed the positions of any off-lying rocks and obtained the necessary soundings by lead-line. As he explored the coastline Beaufort found numerous remains of former civilisations, mainly Greek and Roman, though some dated from the time of the Crusades. Although it delayed his main survey a little, Beaufort felt it was his duty to examine the more interesting ruins and to draw plans and sketches of them. As some made excellent navigational marks, their positions had to be fixed in any case.

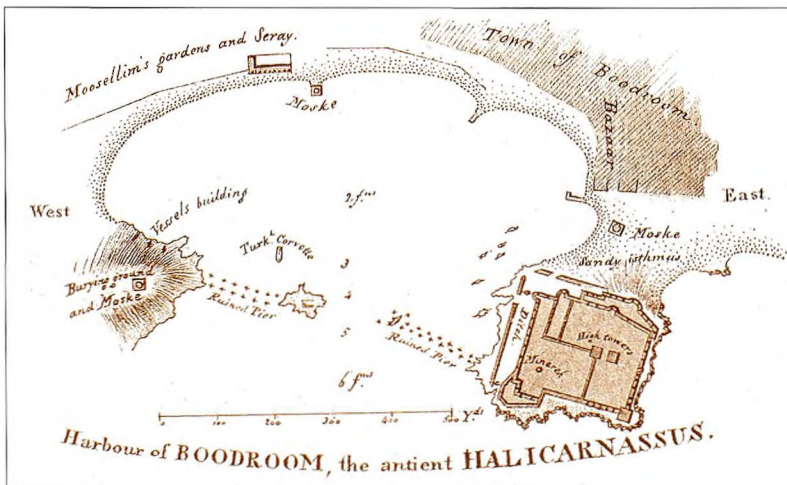
After he had surveyed about 100 miles of coastline, Beaufort decided it was time to obtain another geographical position. A convenient place for his observatory would have been Adalia, the modern Antalya, as it was the largest port in the vicinity, but on reaching Cape Avova [Koca Burnu], 18 miles south of Adalia, Beaufort was surprised to hear gunfire. This he learnt was an attempt by a deposed Bay to retake the town. Beaufort therefore decided to remain at Cape Avova and set up his observatory there, where a satisfactory observation was obtained, using an eclipse of the Moon to obtain an excellent longitude. Beaufort had

hoped that by remaining at the cape his presence would not be detected as he had no wish to become involved in local disputes. These hopes were in vain. Adalia had been recaptured and soon a large body of defeated troops arrived at the beach abreast the ship, requesting protection. This was at first refused, but the next morning with the arrival of pursuing cavalry and an armed vessel, Beaufort embarked the refugees as he was not prepared to stand by and see them butchered in cold blood. After first attempting to land them on the mainland further up the coast and then at Rhodes, the refugees were eventually put ashore on the island of Kos. This gave Beaufort the opportunity to survey the island and adjacent mainland, where he visited and surveyed the port of Boodroom [Bodrum]. Here once more there were interesting ruins to be examined, which he decided were the remains of the ancient city of Halicarnassus. Beaufort was particularly keen to see inside the local fort, where it was said there were some interesting marbles. On requesting permission from the Governor, Beaufort was told the story of a French frigate captain who had also expressed a desire to see the marbles. The Governor told him that he had no authority to grant his request without direct orders from the Porte. The French captain was, however, determined to see the marbles and left to obtain the necessary permission. Having successfully obtained the appropriate *ferman* the Frenchman presented it to the Governor and together they proceeded to the entrance to the fort. Here the Governor paused, saying that the orders of his Master must be implicitly obeyed. 'Let me in, then', exclaimed the impatient captain.

'Undoubtedly' replied the Governor, 'for so am I enjoined to do by the *ferman*, but as it contains no directions about your coming out again, you will perhaps forgive this momentary pause, before we pass the drawbridge' (Beaufort 1817). The French captain, not wishing to put this to the test, left without seeing the marbles. Beaufort likewise deemed it wise not to press the point. By now the season was well advanced and after examining some uninhabited islands to establish the necessary quarantine, Beaufort sailed for Malta where he was to spend the winter.

In the spring of 1812 Beaufort resumed his survey at Cape Avova where its progress had been halted the previous year by his encounter with the fugitive Turks. In spite of his help for the rebels, Beaufort had a friendly reception from the Bey when he first reached Adalia. Later, however, he was treated with suspicion as the Bey clearly thought that Beaufort had been sent from the Porte to depose him. In spite of being unwelcome ashore, Beaufort was still able to note that the town had a thriving trade; English and German goods were being sold in the market and in the harbour wheat was being loaded into ships for British garrisons in the Mediterranean.

As he continued his survey to the east, Beaufort found many more Greek and Roman ruins, all of which he was at pains to identify with their classical origins. At the site of the ancient town of Sidé, about midway between Antalya and Alanya, there were some magnificent ruins in an excellent state of preservation, the most striking of which was a the-



'Harbour of Boodroom, the ancient Halicarnassus'; original drawing by Francis Beaufort; UKHO, OD 524. Reproduced by permission of the Controller of Her Majesty's Stationery Office and the UK Hydrographic Office.

are capable of accommodating over 13,000 spectators. Beaufort regretted he could not spare the time to examine all the ruins adequately since the survey had to take priority and there was a great length of coastline still to be explored. However, Beaufort had to examine the ruins of Seliniti, which he identified with the ancient Trajanopolis, known to the Turks as Gazıpaşa, since they commanded such a magnificent view. From the ruins of the castle, situated on a lofty cape, the surveyors were able to observe

angles into many prominent features, including the coast of Cyprus, 60 miles away.

About 40 miles eastward of Seliniti Beaufort reached the impressive castle of Anamóur [Anamur], inhabited by a friendly Agha. In the castle Beaufort set up his observatory once more, for what was to prove his last observation for geographical position. Further to the east another place of interest was the ruins of Soli or Pompeiopolis, near the town of Mersin [İcel]



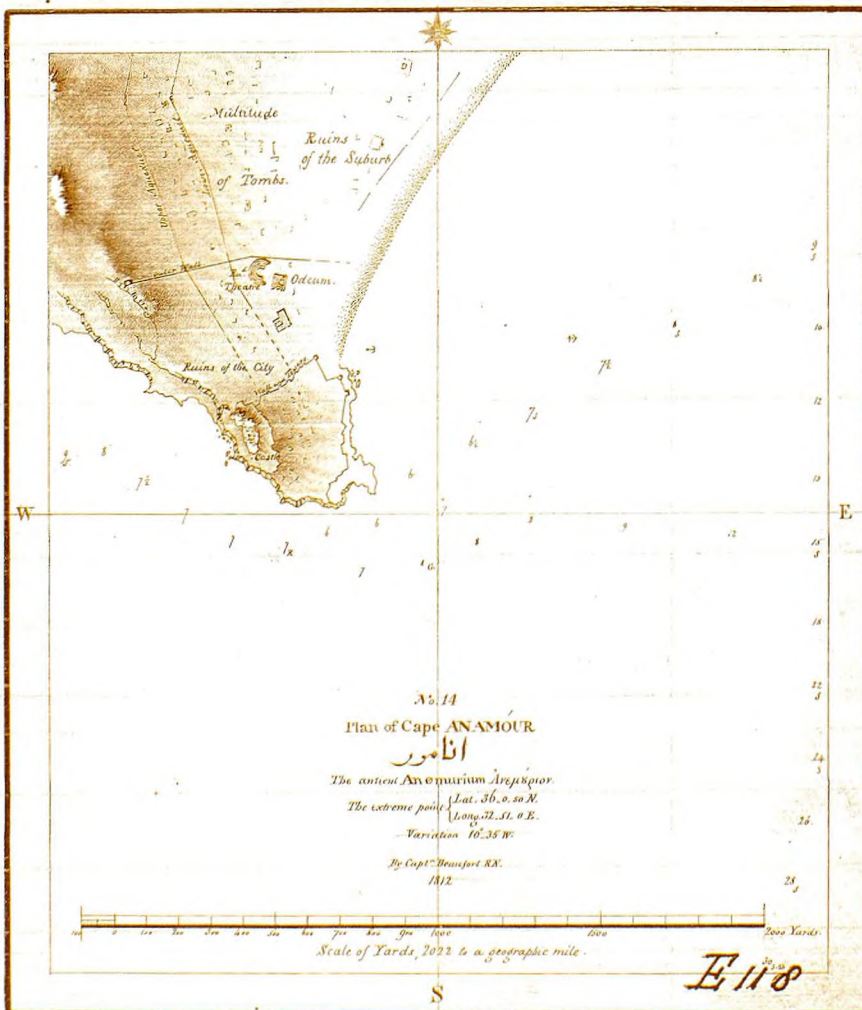
'Ruins of the
ancient Sidé';
Karamania, f.p.
140. Author's
collection.

where there had once been a well constructed artificial harbour. Beaufort measured the remains of the moles and found them to be 50 feet thick. Further on, a place of particular interest was the ancient city of Tarsus, which lay only a few hours ride inland. Beaufort, to his regret, could not spare the time to visit this famous place, although a party of his officers was able to make the trip. However, he can have missed very little since his officers were not very well received by the Governor of the city and there were few antiquities left to see. This reception prompted Beaufort to remark that they invariably found the civility of the natives to be exactly in the inverse ratio of their distance from the ship; and of course her guns!

From Tarsus the survey continued to the east into the Gulf of Iskenderoon [İskenderon Körfezi], where the coastline became very flat and fringed with

marshes. It was in the gulf, on 20 June 1812 that the survey came to an abrupt halt. Beaufort and his party were embarking instruments in a little cove on the north side of the gulf when an armed party of Turks tried to rush the boat. Beaufort fired his fowling piece over their heads, gaining sufficient time to turn the boat and almost get clear of the cove. However, one of the Turks was more resolute than the rest and took deliberate aim at Beaufort who was seriously wounded. Another boat was also attacked and a young midshipman killed. This caused the survey to be broken off and the *Frederickstein* accordingly returned to Malta. For a time Beaufort's life hung in the balance and all thoughts of continuing the survey had to be abandoned.

In spite of not being able to complete his survey, Beaufort delineated over 400 miles of almost



'Plan of Cape Anamôur'; original survey drawn by Francis Beaufort; UKHO, E118. Reproduced by permission of the Controller of Her Majesty's Stationery Office and the UK Hydrographic Office.

1829 when he was appointed Hydrographer of the Navy, filling the post with great distinction for 26 years.

Valuable as Beaufort's contribution was to the survey of the Mediterranean it cannot be compared with that of Smyth. Smyth first went to sea at an early age serving in ships of the East India Company. Whilst in the Indian Ocean he carried out some surveys which reached the Admiralty anonymously in 1796 and 1797. In 1804 the *Cornwallis* in which Smyth was serving was bought into the Royal Navy with most of her crew, Smyth included. In her he saw active service in many foreign waters before returning to England in 1808. Joining the *Milford* in that year, Smyth eventually found himself in Cadiz where he was given command of the Spanish gun-boat *Mors-aut-Gloria* for the defence of the city. This enabled Smyth to meet Admiral Cayetano Valdés, who had served under Alejandro Malaspina during the later's expedition to the Pacific and had commanded the schooner *Mexicana* surveying the waters between Vancouver Island and the mainland. Through Valdés Smyth acquired a copy of Don Vicente Tofiño's celebrated *Atlas Marítimo de España*. Although Smyth held the highest regard for Tofiño's work, he found that his survey of Cadiz contained various errors and omissions. When his other naval duties permitted, Smyth was able to make a number of valuable amendments to Tofiño's chart. As the British and Spanish armies fought their way up the Mediterranean coast of Spain they were supported from seaward by the Royal Navy. This enabled Smyth to make improvements to more of Tofiño's charts and also to carry out some original surveys of his own. Alicante was one such place that Smyth found time to survey. Eventually the fleet reached and blockaded Toulon where Smyth was able to make some valuable additions to the French charts. From time to time the fleet retired to Port Mahon in Minorca, which enabled Smyth to extend his surveys to the Balearic Islands as well.

In 1812 Smyth returned to England where he submitted his surveys to Captain Hurd and as a result Smyth was promoted to lieutenant early in 1813. At the same time his old friend Sir Robert Hall and former commodore of the gun-boat flotilla, requested Smyth to join him in Sicily which was being defended against the French. Before sailing, Smyth consulted Hurd to plan what surveys he could do if

the opportunity arose. Between them they examined the Hydrographic Office's archives in which they found many detached surveys but few geographical positions by which they could be connected. In consequence Hurd told Smyth that the principal requirement was a series of geographical positions so that the various surveys could be connected thus enabling an accurate chart of the Mediterranean as a whole to be drawn.

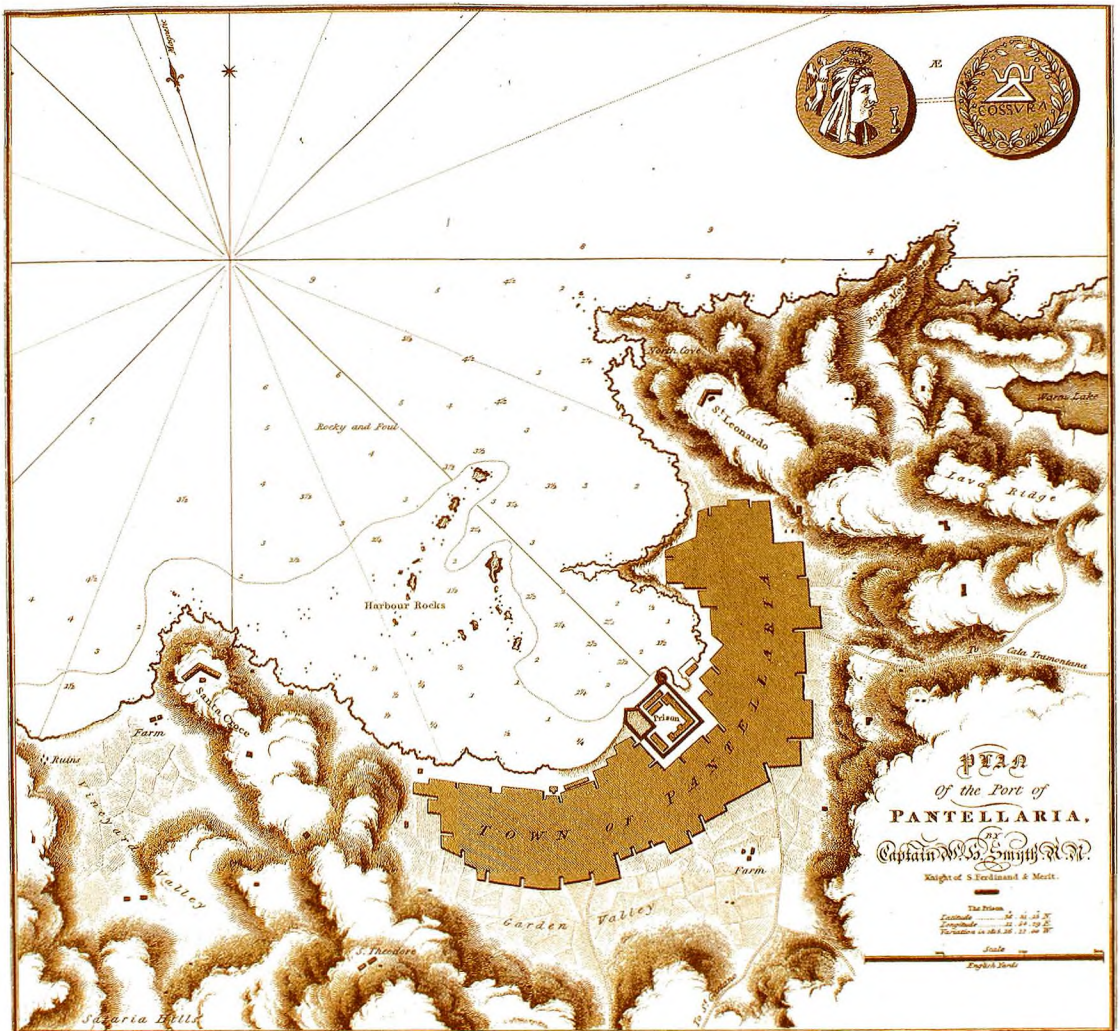
On arrival in Sicily Sir Robert Hall offered Smyth every possible assistance to advance the proposed surveys. Smyth's first discovery was that the plan of the Strait of Messina, which Hurd had assured him was satisfactory, was in fact full of errors. Smyth therefore started by making a new survey of the strait, abandoning his intention to confine his observations to the measurement of longitudes with two chronometers he had been issued with. As well as the chronometers Hurd had issued Smyth with a theodolite, a sextant, a telescope and a station pointer. In addition Smyth had spent £400 of his own money to buy sufficient instruments for astronomical and magnetic observations, including some of Six's thermometers for deep-sea temperatures and a marine barometer and hygrometer for meteorological observations. Smyth was given command of a Sicilian gun-boat in which he carried out surveys when his naval duties permitted. Sometimes these duties carried him to Calabria or Naples, enabling him to run meridian distances there from Palermo. At Palermo Observatory Smyth met the amiable astronomer Abbaté Giuseppe Piazzi who taught Smyth some improvements in his observing techniques and calculations and who became a life-long friend. When Smyth's second son was born in Naples in 1819 he was named Piazzi in the Abbaté's honour. It was in Naples that Smyth met the Neapolitan General Visconti who co-operated with him in surveys in that vicinity.

In the summer of 1814 the British army was withdrawn from Sicily as invasion no longer threatened and Sir Robert Hall left to take another appointment. There were no orders for Smyth either to return to England or to join the Mediterranean fleet under Admiral Pellew. He therefore decided to remain in Sicily and continue his survey. The local authorities were agreeable to this proposal and put one of their best gun-boats at his disposal. Smyth was fortunately able to persuade two army officers

also waiting for orders to assist him in his survey. In 1815, when peace was finally declared, Admiral Pellew's fleet was recalled to England and Admiral Penrose came out to Malta as Commander-in-Chief. Penrose warmly approved Smyth's actions and in consequence Smyth was promoted Commander later that year. Smyth continued his surveys for a further two years without official backing from the Admiralty, by which time he had completed his survey of Sicily, surveyed Malta and the adjacent islands and observed geographical positions at various places in Italy and the North African Coast. In 1824 Smyth published an account of Sicily (Smyth 1824) intended to accompany an atlas of the island published by the Hydrographic Office the previous

year (Smyth 1823). The atlas was well illustrated with a number of interesting sketches of the coastline, as Smyth was a more than competent artist, and a number of the charts were embellished with examples of ancient coins of the locality.

In 1817 Admiral Lord Exmouth was sent out to North Africa to negotiate the abolition of Christian slavery with the Arab States concerned. Smyth persuaded Admiral Penrose to let him accompany Exmouth's squadron to Tunis and Tripoli. At both places Exmouth's mission was successful. At Tripoli Smyth heard from the British Consul-General that the Bashaw had offered the Prince Regent some architectural antiquities from the Roman



'Plan of the Port of Pantellaria'; engraved survey by W.H. Smyth; from Plate 26 of *Hydrography of Sicily, Malta and the adjacent Islands*, London, 1823. Author's collection.

ruins at Leptis Magna. Smyth, who had acquired an interest in archaeology during his Sicilian survey, obtained permission to visit the ruins after the departure of the squadron and to report on them. Smyth travelled 70 miles overland by camel to the ruins which he examined and surveyed, paying particular attention to the nearby beach to assess the possibility of embarking the relics by sea. On his return to Malta Smyth reported favourably on this to Admiral Penrose and in due course an expedition was arranged to collect the relics. When, at the last moment, the officer appointed to take charge refused to go, the appointment was offered to Smyth who naturally accepted. Meanwhile, on 7 May 1817, as a result of Hurd's request to the Admiralty, the 314-ton converted transport *Aid* arrived in Malta, having been sent from England as his command, and at the same time Smyth

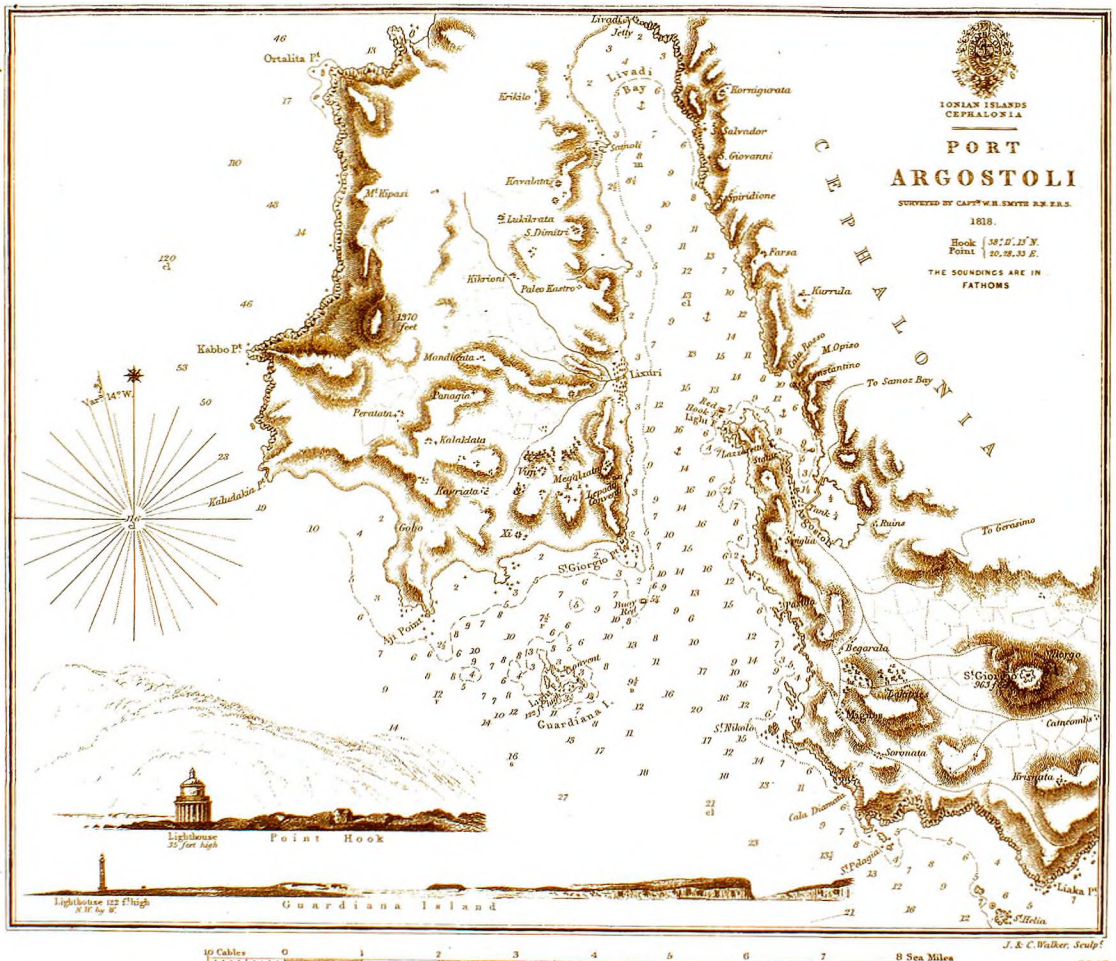
received an official appointment to conduct the Mediterranean survey (Smyth 1854). After extensive repairs to the *Aid* in Malta, Smyth first examined Pantelleria and other islands between Sicily and Cape Bon. Smyth then took the *Aid* to Leptis Magna where, in November 1817, he supervised the loading of the relics into the store ship *Weymouth*. Having successfully completed this, Smyth once again visited Tripoli where he obtained permission from the Bashaw for an expedition eastward along the coast towards Alexandria at some future date. One of the happy outcomes of embarking the relics was Smyth's meeting with Thomas Elson, the master of the *Weymouth*. Smyth was very impressed with the abilities of this officer and obtained his transfer to the *Aid* shortly afterwards. Elson was to become one of the most useful surveying assistants during Smyth's surveys.



'Port Argostoli in Cephalonia'; original survey drawn by W.H. Smyth; UKHO, L1498/5. Reproduced by permission of the Controller of Her Majesty's Stationery Office and the UK Hydrographic Office.

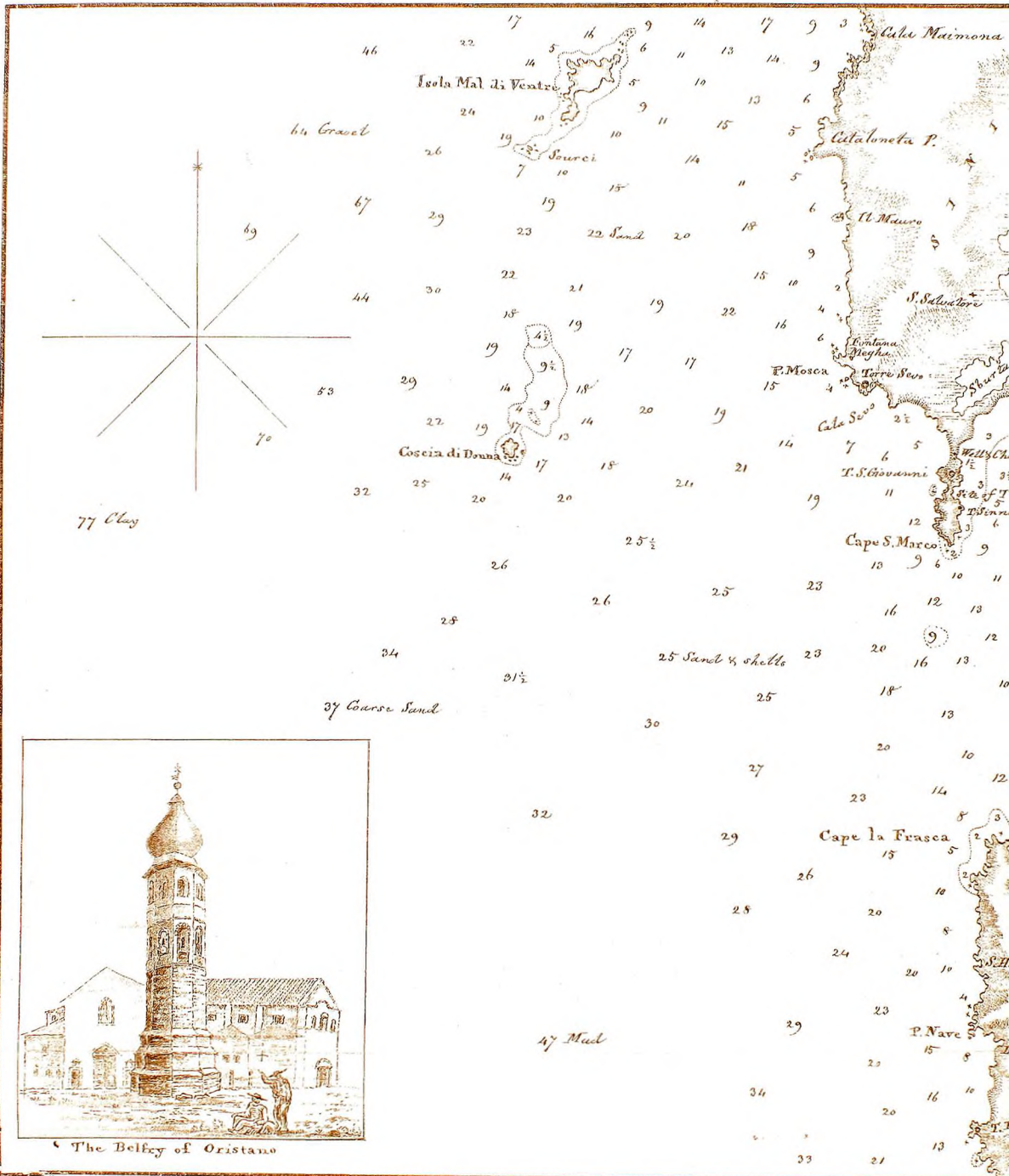
With the arrival of the *Aid*, Smyth consulted Admiral Penrose about future surveys and it was agreed that after the relics had been embarked from Leptis Magna that the Ionian Islands, which had recently been occupied by British forces, should be surveyed first. British ships were often sent to these islands and, on arrival, almost as often ran aground due to the utter inadequacy of British charts. Meanwhile Smyth had been in correspondence with the Austrian authorities who were carrying on a land survey of their Adriatic coastline. On hearing of Smyth's intended survey, the Austrians proposed that the two surveys should be combined, realising that the survey could then be carried out along the whole of the coast of the Adriatic because of Turkish respect for the British flag. Accordingly, with the backing of Admiral Penrose, Smyth visited Naples early in

1818 to negotiate with the Neapolitan and Austrian authorities. Agreement was reached and it was arranged that a party of four Austrian and four Neapolitan officers should join the *Aid*. In addition the Austrian sloop *Velox* was put under Smyth's command with additional assistance of Austrian gun-boats promised at the principal ports. The co-operation at sea was excellent, but ashore Smyth was unable to see copies of former surveys until he visited Milan towards the end of this survey. In consequence some of Smyth's work duplicated that of the celebrated French surveyor Beautemps Beaupré. Much of the survey was occupied in triangulation amongst the many islands off the eastern shores of the Adriatic, but the major harbours such as Trieste were surveyed in detail, as well as minor ones in the Istrian Peninsula. By the end of 1819 the survey of the Adriatic was complete and



'Port Argostoli'; engraved survey by W.H. Smyth. Author's collection.

N I A, by Capt. W.H. Smyth, & Assistants.



'The Bay of Oristano'; original survey drawn by W.H. Smyth; UKHO, L2204. Reproduced by permission of the Controller of Her

Smyth was able to discharge the Austrian sloop and the foreign officers, much to everyone's regret. Smyth wrote that they had always been on the best of terms and that his orders had always been obeyed with speed and good-will. Smyth now

resumed his survey of the Ionian Islands, paying particular attention to the fine natural harbour of Argostoli in the island of Kefallonia, often used as a fleet anchorage by the British Mediterranean fleet in the years before World War II, extending



Majesty's Stationery Office and the UK Hydrographic Office.

his survey to the coast of Albania and the west coast of Morea. Having completed this survey Smyth then returned to the west coast of Italy. At the end of 1820, when surveying in the Gulf of Genoa, Smyth was suddenly recalled to

England, the *Aid* following shortly afterwards to be paid off.

When Smyth was in Malta in 1816, Captain Pierre-Henri Guattier of the French Navy arrived there to measure meridian distances so that the various detached surveys that the French held could also be tied in. 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 him place his circle on the very spot that Smyth himself had used. A comparison of their results was most satisfactory. Not only did the French and English positions agree exactly, but a free interchange of methods and documents took place afterwards. As a result Smyth and Guattier continued to meet each year to compare results. Thus, when he was consulted on his return to England on the state of the survey of the Mediterranean by Lord Melville, the First Lord of the Admiralty, Smyth suggested that much time could be saved if the French and English avoided surveying the same localities. Smyth knew from recent correspondence with Guattier that the French were surveying in the Greek Archipelago. He therefore proposed to Lord Melville that the French should continue surveying there while he concentrated on the western Mediterranean and the north coast of Africa. Lord Melville concurred and authorised Smyth to go to Paris to draw up the necessary agreement. This was successfully accomplished and Smyth was supplied with copies of all the French surveys in the Black Sea, the Greek Archipelago and the Levant. To Smyth's great disappointment Guattier was unable to be in Paris as he was being held in quarantine in Toulon.

In July 1821 Smyth returned to the Mediterranean in the *Adventure*, as his former command had been renamed, with orders to complete his surveys in the next three years. He first revisited Tripoli with a present from the British Government for the Bashaw. At the same time he landed a party commanded by Lieutenant Frederic William Beechey, to survey the coast from Tripoli to Alexandria for which Smyth had already obtained permission. Beechey, who had recently returned to England from a voyage to the Arctic under the command of Captain W.E. Parry, had as his assistant his brother Henry, a well known traveller in Egypt. Meanwhile the *Adventure* was to examine the area for offshore dangers. Smyth considered it would be imprudent to take his ship into the Gulf of Sidra [Khaliz Surt], about which nothing was then known,

so no arrangements could be made to co-operate with Beechey. However, Elson was sent into the gulf in the *Adventure's* launch on a surveying cruise.

At the beginning of November Beechey and his party set off from Tripoli, dressed in Arab clothing and accompanied by an escort of Arabs. Near the entrance to the Gulf of Sidra, Beechey was pleased to find signs that Elson had landed a few weeks earlier and that a party from Guattier's ship had also landed in the same vicinity. Guattier had left a geographical position on a board which prompted Beechey to measure a base and observe a geographical position as well, which was in satisfactory agreement with that of Guattier. Early in January 1822, Beechey arrived in Benghazi [Banghāzī], where he remained for several months because the rainy season had set in. While he was there a rumour swept the town that a Greek invasion was about to take place, the Greeks at that time being in revolt against the Turks. Suspicions had been aroused when the *Adventure* had been seen in the offing, followed shortly afterwards by the arrival of Beechey and his party, who started to sketch the harbour and fortifications. When a few days later clouds were seen on the horizon, they were mistaken for sails and panic swept the town. The survey marks set up by Beechey eastward of the town were taken to be signals to direct the invasion fleet. A mob soon collected outside the house where Beechey and his party were staying, shouting invectives, when the situation appeared ugly. Before matters got out of hand the party's Arab escort made their way to the house and began to parley with the mob outside. However, before any conclusions could be reached, an alarm was raised that the Greeks were landing in the harbour and the entire mob rushed there to defend the city. After waiting several hours in vain for the non-existent invaders, the Arabs realising they were mistaken left quietly for their own homes and the incident fizzled out.

When the rains subsided Beechey continued his survey to the east. As well as the actual survey work, the numerous ruins dated from Roman times that are to be found in this region were also examined. When he reached Cyrene, Beechey received news that Smyth and the *Adventure* were at Derna [Darnah]. Beechey at once hurried there where he learnt from Smyth that the latter had been to Alexandria and had surveyed the coast from there as far as Derna. On the departure of the *Adventure*

Beechey surveyed Derna and then returned to Cyrene where he had left the remainder of his party. As there was now no point in continuing to the east, Beechey turned back, keeping well inshore so that the ruins at Appolonia, about halfway between Derna and Cyrene, could be visited. When these ruins had been examined, Beechey returned to Benghazi, sailing from there to Maita at the end of July (Beechey 1828). Meanwhile Smyth had made for Cape Bon in order to survey the coast from there to Tripoli.

In 1823, Smyth resumed his surveys off the west coast of Italy, concentrating on the islands and channels in the vicinity of Elba. After completing these surveys Smyth sailed for Sardinia, where he found the French survey ship *Lioriret*, Captain Anne-Chrétien-Louis de Hell, sheltering from a gale. The two captains met and discussed their surveys. Smyth discovered that Hell was conducting a detailed survey of Corsica, where Smyth had observed some geographical positions in the Strait of Bonifacio. A comparison between Smyth's positions and those of Captain Hell showed good agreement and Smyth had no hesitation in telling Captain Hell that he would not carry out any further surveys of the French island.

Early in 1824 the Admiralty at long last sent out the *Nimble* with Lieutenant Michael Atwell Slater in command to act as tender to the *Adventure*. Smyth spent the rest of this year with the *Nimble* completing his survey of Sardinia. As elsewhere, he concentrated on the principal harbours and anchorages. His survey of the Bay of Oristano [Golfo di Oristano] is a good example of the accuracy of his work, comparing very favourably with the modern chart. At the end of the year, his task almost complete, Smyth sailed for England in the *Adventure*, leaving Slater behind in the *Nimble* to finish off some important surveys and to clear up a number of uncertainties. In 1828 Smyth published an account of the island of Sardinia (Smyth 1828).

In the 15 years that Smyth had been in the Mediterranean he had made astronomical observations ashore to obtain geographical positions at 62 places, each set of observations requiring considerable mathematical calculations. In addition he had determined the positions of over a thousand other places by chronometer, triangulation or similar methods. These positions formed the basis of

his surveys and also enabled the Hydrographic Office to construct accurately the small scale charts of the Mediterranean from the other surveys they held in their archives. In all, Smyth drew 170 plans of ports and anchorages and 25 coastal sheets that were either completely or partly new or substantially corrected. These surveys were accompanied by a number of useful coastal views. From his surveys Smyth drew a series of coastal charts covering the North African coast from Tangiers to Alexandria, the north coast of the Mediterranean from Cadiz to the southern tip of Greece and the islands of Malta, Sicily, Sardinia, Corsica and the Balearic Islands, incorporating where necessary the work of other surveyors.

In addition to his purely survey work Smyth found time to make oceanographical observations; he kept a daily meteorological log and subsequently wrote on the meteorology of the area. He observed and commented on the tides and currents and even observed the habits of fish. Thus Smyth was able to write that, even when he was becalmed, he still found much to do, since this was an ideal time to use his deep-sea thermometers, obtain water samples or make other observations.

Smyth made no pretence that his surveys were as detailed as they might have been. In his view his main task was to gather information to correct existing charts rather than carry out completely original surveys. He estimated that otherwise his survey of Sicily alone would have taken ten years. Smyth foresaw that later surveyors would produce better charts and some years later wrote to Beaufort telling him that as such surveys were received to burn his. Fortunately for posterity Beaufort did not accede to this request.

On his return to England Smyth set about preparing his surveys for publication. This required a suitable drawing office and access to the Hydrographic Office's archives. Captain Parry, who was now Hydrographer, allowed Smyth the use of an office for that purpose. This was a happy arrangement for both Smyth and Parry as the latter then had a competent officer to whom the office could be entrusted in his absence. This arrangement was, however, abruptly terminated, much to Parry and Smyth's surprise when, in October 1826, Croker personally instructed Smyth to spend the following week making final arrangements to complete the engraving of

his charts and then to vacate his office. Smyth learnt at the same time than his uncompleted charts were to be sent to another officer to prepare for engraving. As this constituted the bulk of his last seven years work, Smyth took umbrage and left the Admiralty at once taking all his surveys with him and, for the time being, no further work was done on them. This state of affairs continued until 1829 when Francis Beaufort was appointed Hydrographer. When Croker resigned in 1830, Beaufort was able to persuade Smyth to start work again on his charts. The amount of work that had to be done was enormous, particularly as Smyth insisted in producing his completed charts in a fit state for engraving. But slowly progress was made and from time to time Smyth wrote to his friend Beaufort saying that a further batch of charts was being sent to London. This time Smyth was taking no chances and had decided to draw his charts at his home in Bedford. The ensuing delay enabled Beaufort to arrange for surveyors working in the Mediterranean to fill in gaps in Smyth's work at the latter's request. This naturally led to further delays and it was not until 1839 that Smyth finally completed his charts and a few more years before they could all be engraved. Only 32 of Smyth's charts were listed in the 1825 *Admiralty Chart Catalogue*; which were his charts of Sicily, Malta and adjacent islands. These were priced at £7.10.0 or, in stiff marble paper covers with leather back at £8.8.0. The atlas was also available from the publisher of Smyth's *Memoir...of Sicily* (Smyth 1824, xvi). The 1839 catalogue, however, listed 81 of Smyth's charts and in the 1846 catalogue over 100 charts were attributed to him, which shows how completely Smyth's work dominated the British survey of the Mediterranean.

Smyth's influence of the survey of the Mediterranean was felt long after he had returned to England. One of his legacies was that no fewer than eleven officers who had served with him continued actively in the surveying service. Thomas Graves, who was his senior assistant in the *Adventure*, returned to take charge of the Mediterranean survey after a commission in South American waters. Elson, after serving in the Pacific and Arctic with F.W. Beechey in the *Blossom*, returned to the Mediterranean to serve in general service ships, but this did not prevent him rendering some important surveys. Smyth corresponded with both these officers for many years and also with his friends Piazzi and Visconti.

After he had completed work on his charts, Smyth published in 1854 *The Mediterranean: A Memoir Physical Historical and Nautical*, which gives a detailed description of the area, with information on tides, currents and weather, and with an historical account of the surveys in the area, including his own. An appendix to the book gives a list of all his and Guattier's geographical positions. It was intended to be complementary to a Mediterranean *Directory* giving sailing directions for the area which was being compiled at the same time by Graves, partly from information supplied by Smyth.

It would be unfair to the many fine surveyors who followed Smyth and Beaufort if their names were not mentioned. Richard Copeland carried out numerous surveys in the Greek Archipelago; Graves surveyed much of the Aegean between 1831 and 1850; Thomas Saumarez Brock, a noted water-colour artist, surveyed in the eastern Mediterranean between 1836 and 1847; Thomas Spratt was employed in the Mediterranean continuously from 1832 to 1863, first as a Midshipman under Graves and finally in command of the *Spitfire*, distinguishing himself in the Crimean War; Arthur Mansell was also employed in the Mediterranean between 1834 and 1865, first under Graves, then under Spratt and finally in charge of the survey. Taking into account the work of all these able surveyors, Smyth's contribution was still supreme. It can best be summed up by a tribute that Beaufort paid to him in 1839 in a minute to the Secretary to the Admiralty, 'I think I am warranted in stating that there is no person living to whom H.M. Naval Service is more deeply indebted than to him - nor to whom some strong expression of the Lordship's approbation and favour is more justly due' (UKHO Minute Book).

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Andrew David is a retired Lieutenant Commander, Royal Navy, who specialised in hydrographic surveying. He is the senior editor of the 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.

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