

Classic Boat

THE WORLD'S MOST BEAUTIFUL BOATS

EVENTS GUIDE

Local & Global
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ELECTRIC PROPULSION
Owner's restomod story

THE EXPLORER
Robin Knox-Johnston



The hand-coloured title pages of the magnificent 'King's copy' of Collins' atlas, from the library of George III (British Library)

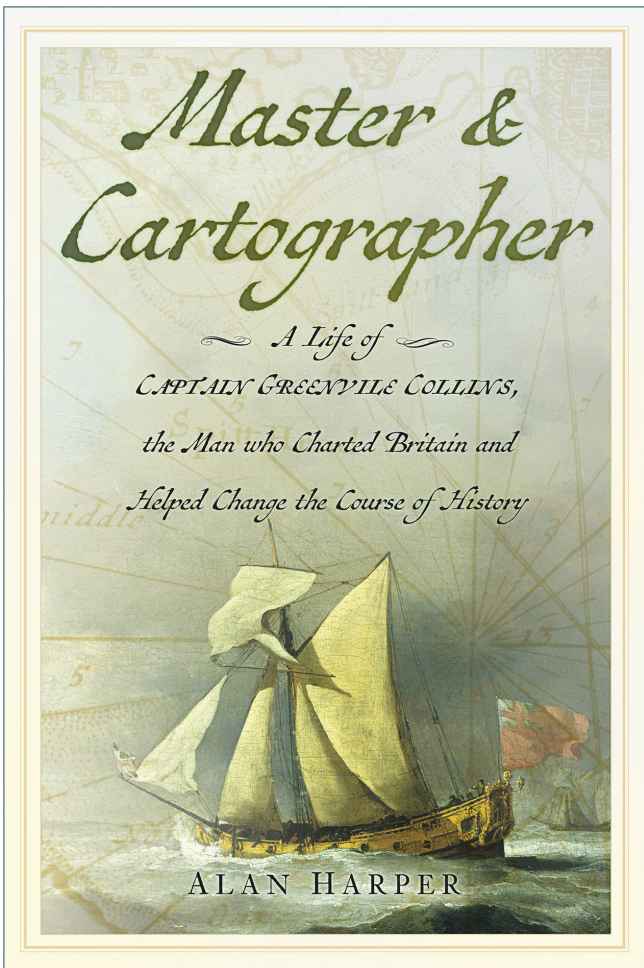
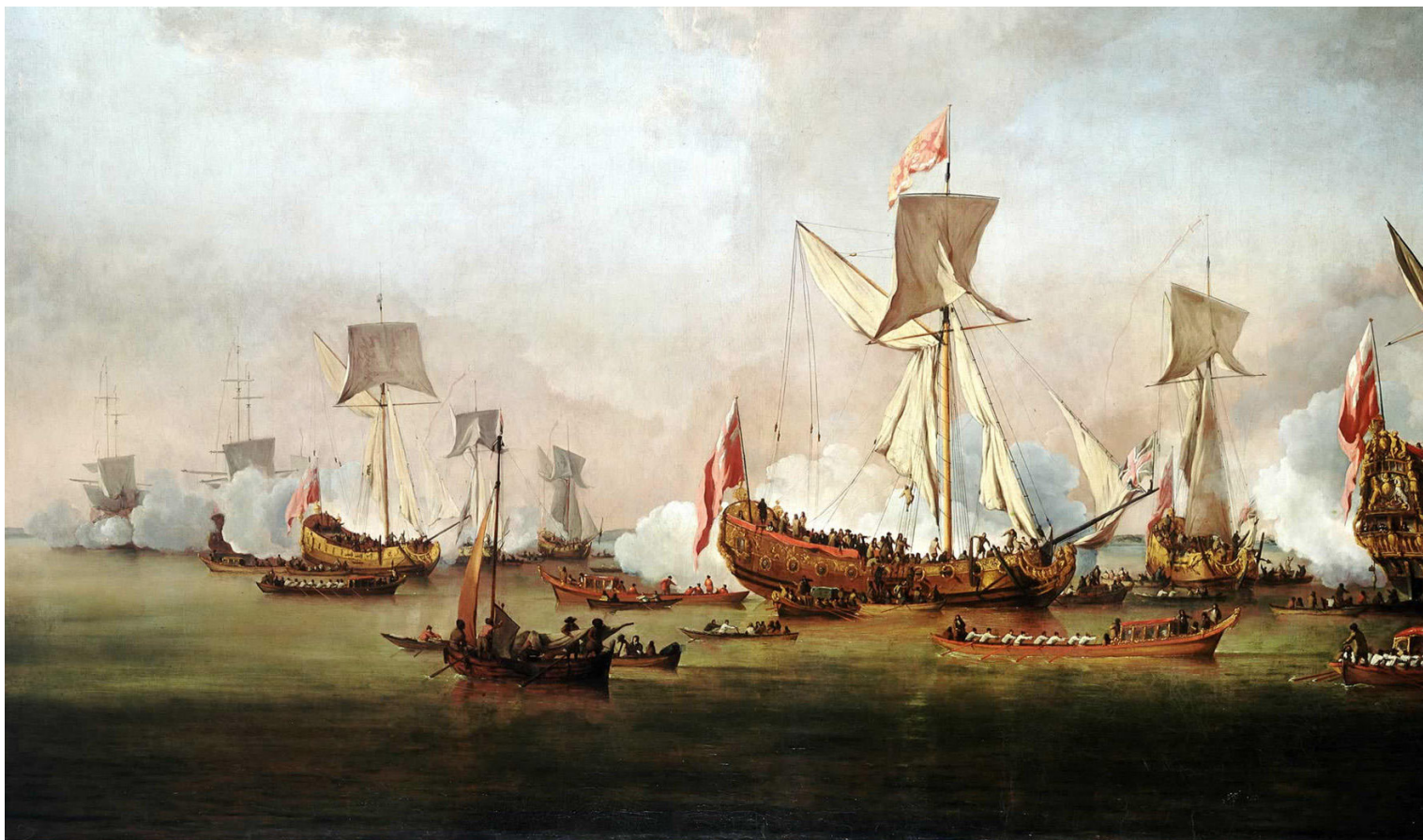


CHART MASTER

The most important naval officer you've never heard of – Greenville Collins, yacht captain and hydrographer – worked for three successive kings, singlehandedly hauled English chart-making out of the dark ages, and created the first modern pilot book

WORDS AND PHOTOS ALAN HARPER



The yacht *Merlin* heeled over in the gusts coming off Rame Head as her helmsman cut in close past Penlee Point on Cornwall's south coast. As she settled on her course, the hands adjusted the set of the sails and her captain sat down in the cabin, sharpened his quill, and penned a note to the Admiralty: "I came into this port this day sevennight and am now under saile bound away to the westward."

It was August 1681, and the yacht was leaving Plymouth Sound: "Since my being here I have taken an exact survey of this place, and some others about it, and have taken the advice of the skilfullest seamen and fishermen of these parts." Just a few weeks before, Greenville Collins had sailed out of the Thames to begin his ambitious survey of the British coast, having persuaded King Charles II to back him in the venture. This went somewhat against the inclinations of Samuel Pepys, although even the naval secretary had to agree that such a survey was long overdue: most English navigators used Dutch charts, or copies of them, because there was nothing else.

At 38, Collins was a seaman of wide experience. He had sailed on expeditions to the Arctic and the Strait of Magellan, and served as master – responsible for sailing and navigation – aboard numerous warships in home waters and the Mediterranean. It was his early voyage to Patagonia with the scientific naval captain John Narbrough that first seems to have piqued his interest in hydrography, and his subsequent journals are full of drawings and sketch charts.

His idea was to produce a folio of home-grown charts of British waters, complete with detailed pilotage notes. Published in 1693, his *Great Britain's Coasting Pilot* was the first modern pilot book. It remained in print for nearly 100 years.

Above:
 'The Departure of William of Orange and Princess Mary for Holland,' by Willem van de Velde the Younger

USING YACHTS AS SURVEY SHIPS

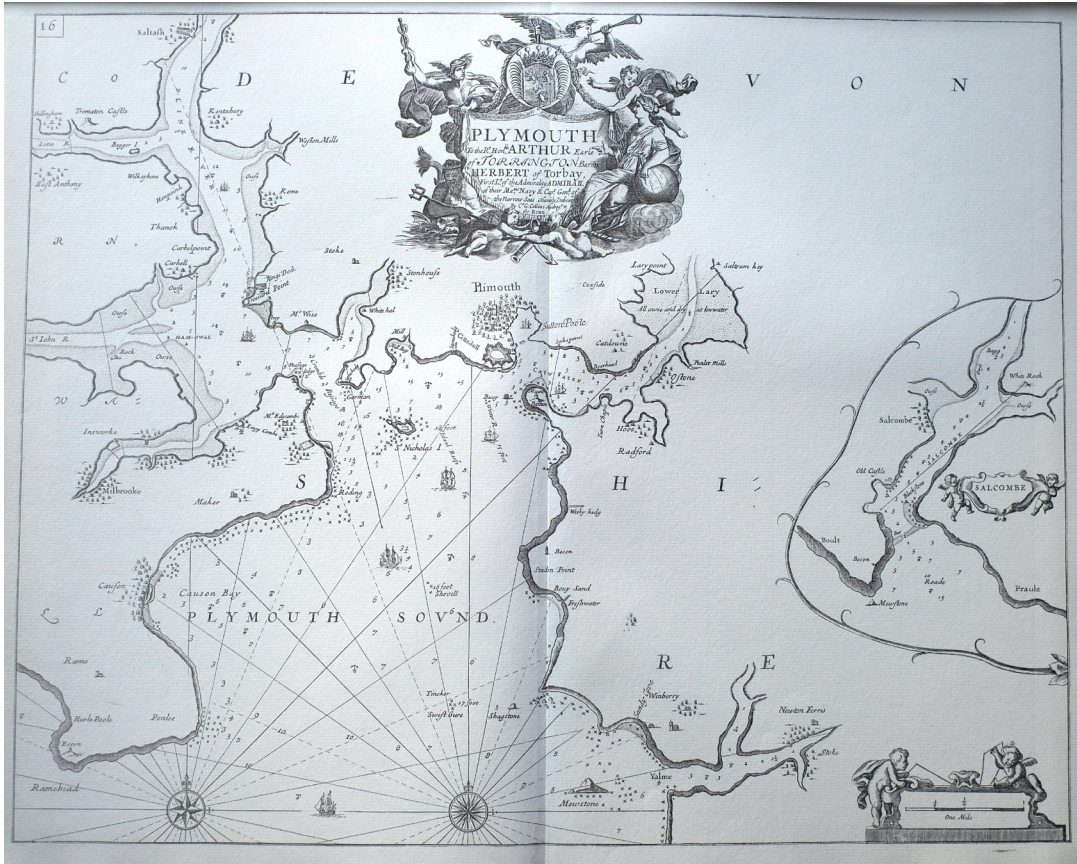
Having discovered the joys of sailing while in exile during Cromwell's commonwealth, the king and his brother, the future James II, lost no time after the Restoration of 1660 in soliciting English shipbuilders to come up with their own take on the Dutch pleasure-boat concept. With their elegant sheer and high stern, these English yachts looked like miniature warships, but used a simple rig that could be easily handled by a small crew – generally a single mast, a loose-footed gaff mainsail, a square topsail and one or two staysails tacked to a long bowsprit. They were typically 50-55ft (15.2-16.8m) along the keel, and 18-19ft (5.5-5.8m) in the beam, lavishly decorated with carved wood and gilding, and armed with small cannon.

Greenville Collins

Greenville Collins (1643-94) was a naval warrant officer who worked successively for Charles II, James II, and William III, as a chart-maker, navigation tutor and yacht captain. Even by the standards of the tumultuous times he lived in, he had an extraordinary career, journeying to Patagonia and Chile as well as taking part in an Arctic expedition and serving in the Mediterranean. On one cruise he was tasked with teaching the rudiments of navigation and seamanship to the teenage Duke of Grafton, one of King Charles's numerous illegitimate children.

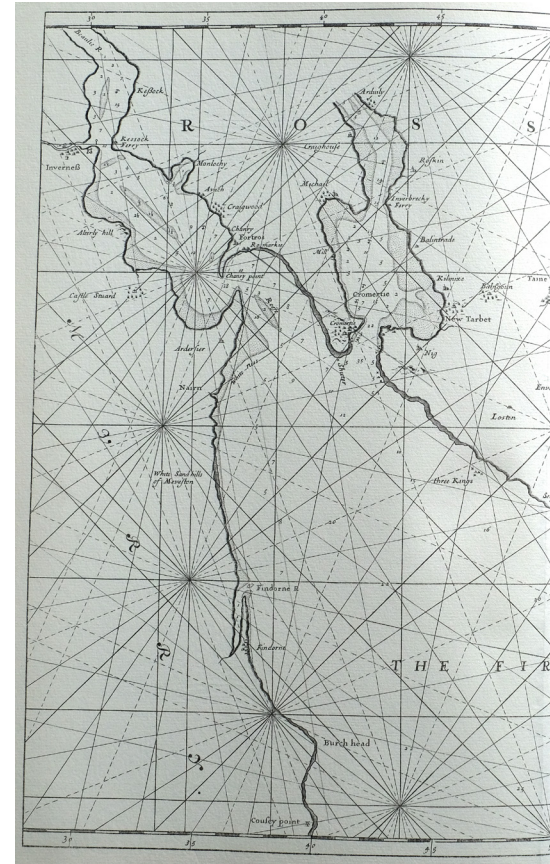
In 1688 the European world shifted on its axis when the Dutch stadtholder, William of Orange, invaded England with the conspiratorial co-operation of the Protestant establishment, including elements of the Royal Navy. Collins was in the thick of it, navigating the Catholic King James II's flagship, HMS *Resolution*. William's succession led in short order to the Bill of Rights, redrafting the contract between the crown and the people. Collins became his yacht captain.

Known today for his great atlas of sea charts, *Great Britain's Coasting Pilot* published in 1693, Collins is regarded as the father of British hydrography – but that's only half the story.



Above left: Plymouth Sound. It took Collins just a week to survey in 1681, yet the chart set a new standard

Above right: One of Collins' best charts, this rendition of the Moray Firth nevertheless still has its issues



By the 1680s sailing had become a fashionable pursuit among the gentry, and the navy kept a small flotilla of yachts at the royal dockyard in Deptford, just downriver from London. Some of these were fitted out for the king's and his brother's personal use, and in these the royal rakes engaged in yacht races and entertained their myriad mistresses. But most were more workaday vessels, employed all year round as packet boats and on harbour service duties.

MAPPING THE EDGE OF A NATION

For his survey, Greenville Collins was entrusted first with *Merlin*, then with *Monmouth*, both Thames-built and with a peacetime complement of 20. As commanding officer, Collins enjoyed a palatial, full-width stern cabin, far bigger than the cupboard-sized compartment he would have had as the master of a man of war.

The yachts were small, but solidly built and seaworthy – as they had to be in an age of natural fibres and no weather forecasts. At a time when even full-sized warships were usually laid up for the winter, Collins was often caught out late in the year. Attempting to wrap up his first surveying season and head back to the Thames, he was still down in the West Country in November, and the weather was horrible, as he wrote to the Admiralty from the River Exe. What he needed was two or three days of steady south-westerlies to get up-Channel past

Portland Bill and on towards the Downs, but so far he had been driven back in to the river twice – the second time after splitting the mainsail in the middle of the night while trying to claw off a lee shore, and then shipping a huge sea over the bow that destroyed the boats on their chocks and stove in the cabin bulkhead. With the shredded sail thrashing from its boom and several tonnes of solid water swirling over her deck, for a few endless seconds the little yacht's survival was in the balance. But she rose, the sea streaming from her scuppers, and “with much difficulty” they made it back over the bar and up to Topsham for repairs.

The survey took Collins several years. Some of his most impressive work comes from these early seasons in the West Country and on the south coast. If his letter to the Admiralty is to be believed, the Plymouth survey only took him a week, and yet the Plymouth chart is one of the finest in *Great Britain's Coasting Pilot*. Collins clearly made good use of all the local knowledge he could glean.

The Scilly Isles were plentifully provided with professional pilots to guide trepidatious mariners in among the rocks and shoals, and Collins certainly sought their advice. But he also had access to an excellent military map of the islands, lent by the local garrison. With the shoreline thus taken care of, he could concentrate



Left: Detail from the Isle of Wight chart showing the approaches to Portsmouth, an important naval base even then



on soundings and the offshore outcrops, and the resulting chart is a masterly achievement. On his Isle of Wight chart, the eastern approaches to the Solent and Portsmouth received particular care: the harbour was an important naval base even then.

It is difficult to overstate how much better Collins' charts were compared with what preceded them. There was no nautical equivalent of the competent county maps of Saxton and Speed. Local pilots or ship owners might have had their own, private, manuscript charts of individual ports and their approaches, but Collins made it his mission

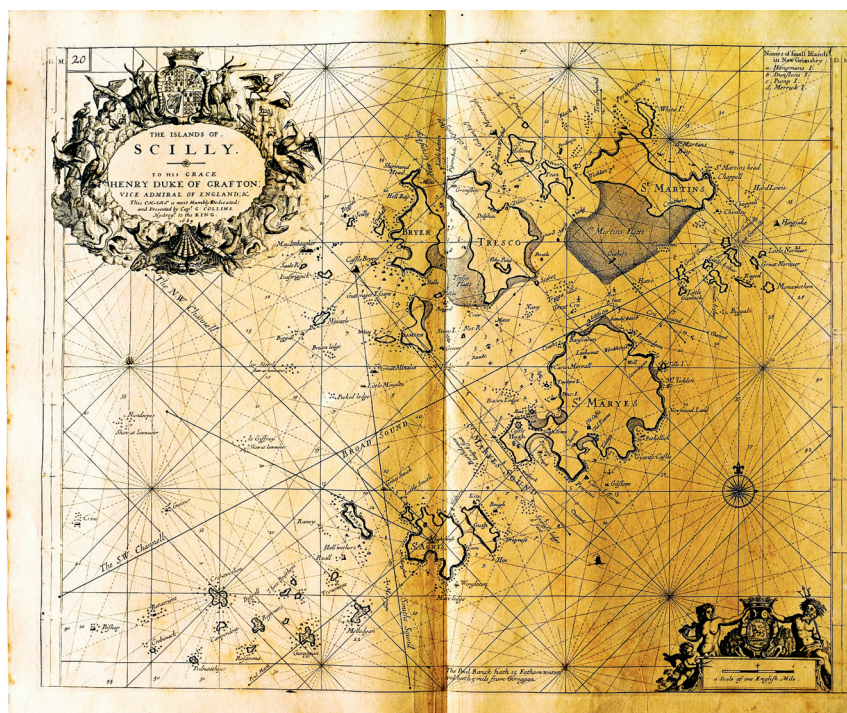
Above: The complicated approaches to Harwich as plotted on Collins' chart, which he dedicated to Samuel Pepys

to publish reliable, professional charts at a practical, useful scale that would be available to all navigators.

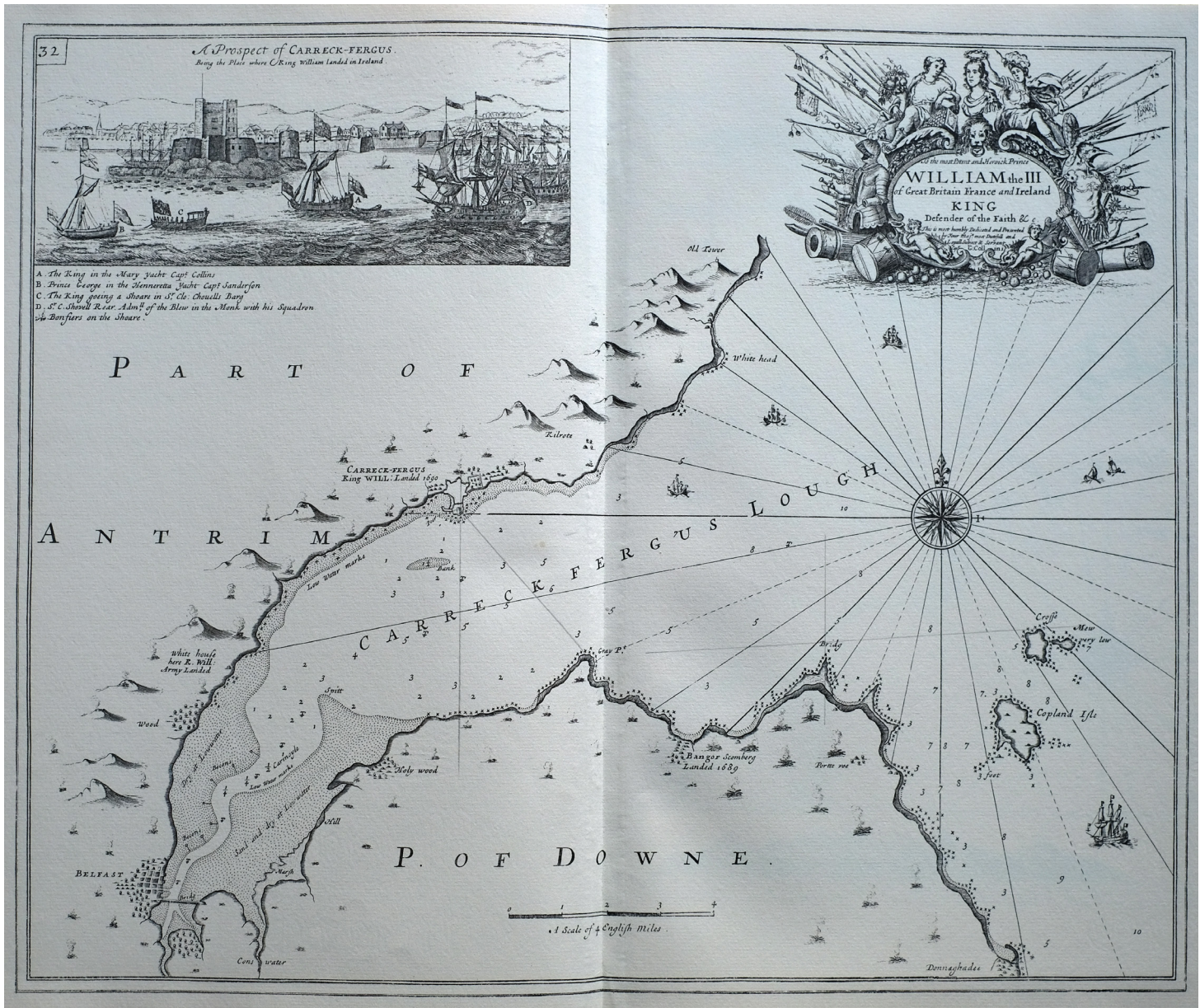
He ventured around Land's End in the summer of 1682 and into the southern Irish Sea, while the entire eastern side of the British Isles, as far north as Orkney and Shetland, claimed his attention in the 1683 and 1685 seasons. His superb delineation of the complex waters off Harwich was dedicated to Samuel Pepys. The Moray Firth chart, with its detailed approaches to Inverness and the future naval base of Cromarty (in his pilotage notes Collins predicted "this harbour is able to contain the Navy Royal") could be used today with few qualms.

He went back to the Irish Sea in 1686, by which time he was getting some of his earlier surveys engraved and ready for press. Publishing was an entirely new trade that he had to learn, dealing with draftsmen, engravers and printers in the busy studios and workshops around St Paul's in London. A fish out of water, he struggled. In one telling aside in the Pilot's text, he growls: "The Draught of the Severn is not so well finished as was intended, by reason the Ingraver lost the Original Copy."

Finally, in 1690, trying to finish off the Pilot while also serving as yacht captain to the new king, Collins took the chance to add to his work in the west, adding several surveys of Irish harbours as William III pursued his bloody business against the deposed James II. Collins' Carrickfergus chart is like a cartographical history painting, telling the story of King William's arrival on Irish soil prior to the Battle of the Boyne. An inset added to the Bristol Channel chart shows the flotilla of warships



Left: One of the masterpieces in Collins' Pilot, his chart of the Scilly Isles was a huge advance on previous published efforts (antiquemapsandprints.com)



that escorted Collins and his king on their return to England in the royal yacht *Mary*. The pointing figure on the aft deck of the yacht probably represents Collins himself.

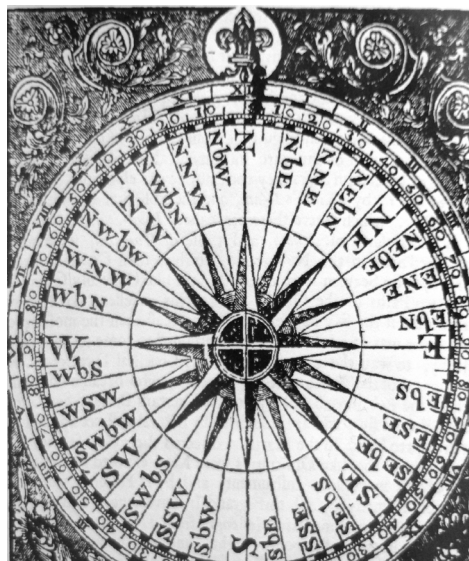
SURVEY METHODS AND EQUIPMENT

Among the instruments Collins acquired for his survey was an enormous, 5ft (1.5m) radius, brass quadrant for measuring latitude, that cost £60 – more than his annual salary as a yacht captain. To this he added a smaller quadrant, a theodolite, measuring chains and measuring wheels, a selection of compasses, and a hand-held Davis quadrant. The Davis was the 17th-century’s industry standard for professional navigators, its user standing with his back to the sun while the wooden quadrant’s two graduated arcs, of 60° and 30°, allowed for fine adjustment. Accuracy to within one sixth of a degree – ten nautical miles – was theoretically possible.

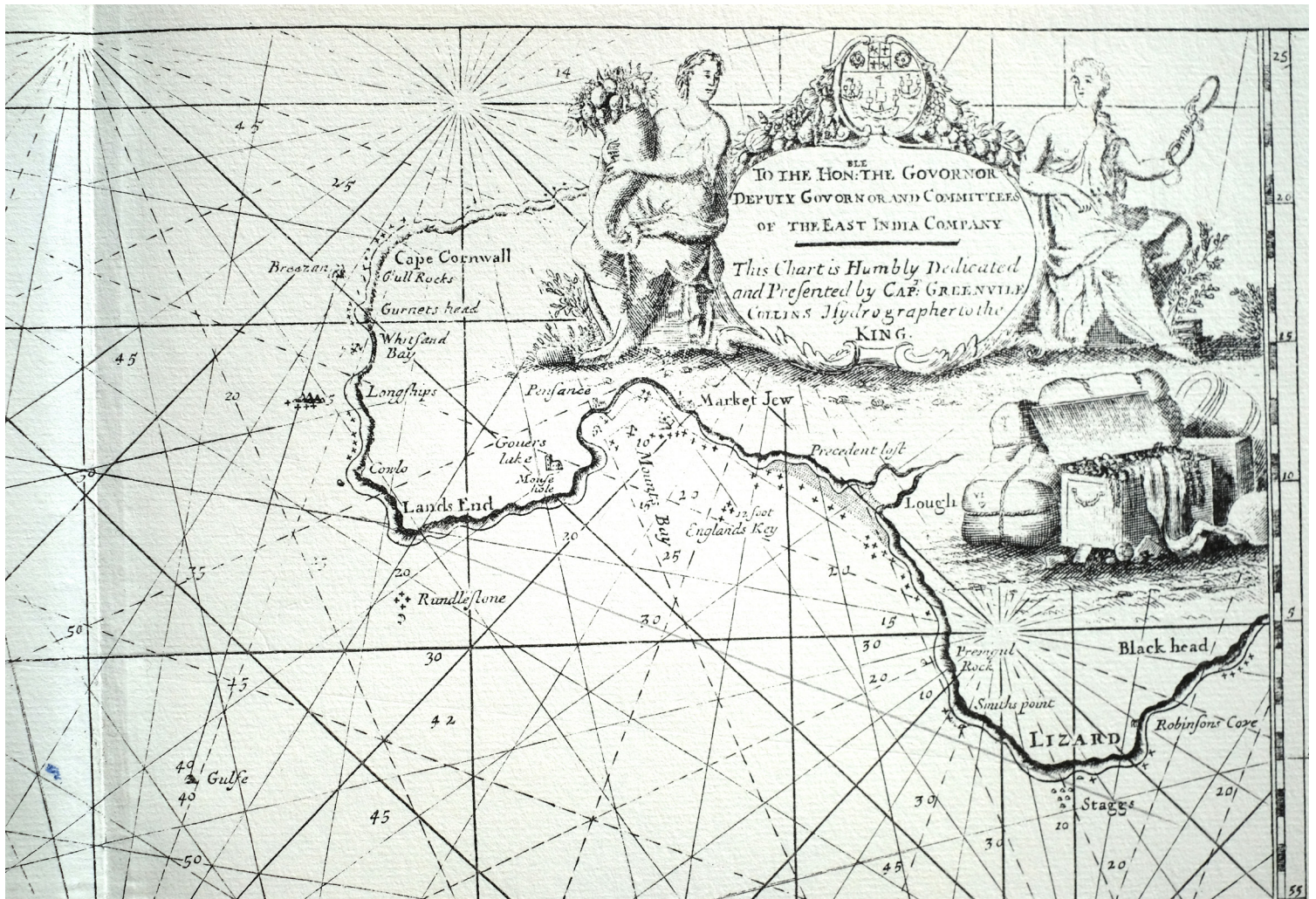
With all this expensive gear, Collins was well equipped to survey the shoreline from the land, using triangulation, and no doubt

Above: Like a cartographical history painting, Collins’ Carrickfergus chart documents William III’s arrival in Ireland, complete with celebratory bonfires on shore

that was his intention. But the speed at which he worked suggests that he didn’t actually do so very often. It just took too long. Instead, from aboard the yachts he would often have used the well-understood ‘running traverse’ technique, now known as the running fix, which had allowed Dutch mariners down the ages to survey the coastline of England without setting foot on shore. He might also have used a technique known today as the ‘abeam and four-point bearing’, in which two bearings are taken of a fixed object on shore, one at 45 degrees (four points) and one at 90 degrees as it draws abeam, to create a triangle in which the distance sailed between the bearings is equal to the distance from the object. He would have resorted to the laws of sines and cosines where two angles and only one side of a triangle were known, or two sides and only one angle.



Left: A 17th-century woodcut of a 32-point compass rose. The idea of sailing a course to within a degree or two would have been greeted by gales of laughter by a 17th-century helmsman. Within half a point was more like it.

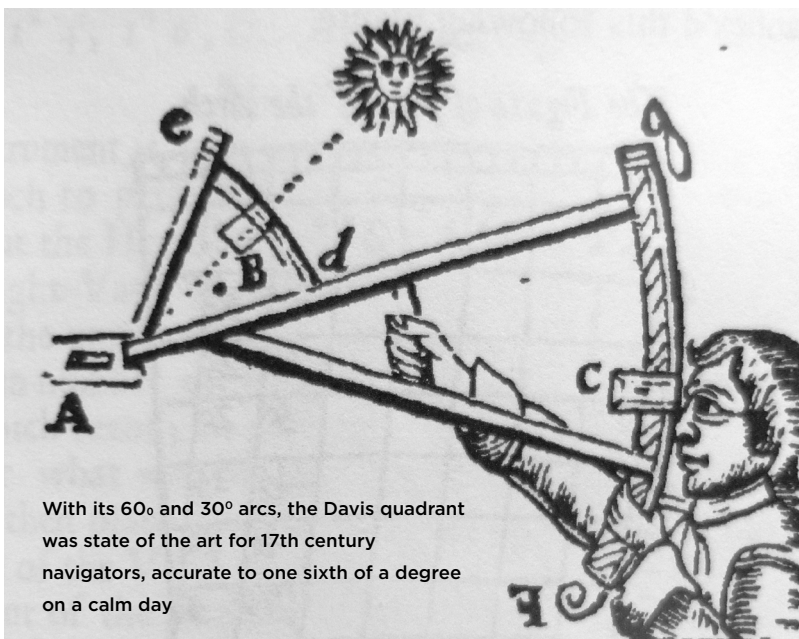


Errors were inevitable in any method not involving setting foot on land, and they would accumulate. But by these means Collins could at least position prominent shoreside features in relation to each other. It then remained to plot the direction and rate of the tide, reconcile the angles with true north, and fill in the gaps in the coastline by eye. It was far from perfect, but it was efficient, kept guesswork to a minimum, and enabled him to work quickly.

Above: Detail from Collins' chart no. 19, with its erroneous 20-fathom sounding between Lands End and the Runnel Stone

Achieving accurate latitudes was difficult. While on some of his charts Collins nails them with impressive accuracy – perhaps these were occasions when he set up his heavy 5ft quadrant on shore – on others he is way off. And there are errors which are frankly puzzling to find in the work of such a scientific navigator, who produced so many excellent charts. In a few early impressions, the latitude scales were labelled, mysteriously and quite inexplicably, 'Land Latitude' in one margin and 'Sea Latitude' in the other. An engraver's error?

Equally mysterious is a 20-fathom (36.6m) sounding that Collins placed between the Runnel Stone rock and the Land's End peninsula, in an area of shallow water. It is hard to see how such a mistake could arise – unless, perhaps, Collins sought advice from some less than scrupulous locals who enjoyed a lucrative sideline as wreckers!



With its 60° and 30° arcs, the Davis quadrant was state of the art for 17th century navigators, accurate to one sixth of a degree on a calm day

About the author

Alan Harper has been writing about boating, seamanship and navigation for longer than he cares to remember. His new book, *Master & Cartographer – A Life of Greenville Collins, the Man who Charted Britain and Helped Change the Course of History*, is published by The History Press. More info at alanharper.co.uk

