Matthew Flinder's Great Voyage

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The vessel selected for a great voyage of Australian discovery was *Xenophon*, an English north country built ship such as Captain Cook would have chosen. She was fitted out for the voyage at Sheerness, renamed Investigator and a crew of volunteers raised for her.

Fowler, the First Lieutenant of *Xenophon*, continued these duties in the newly named ship, Flinders' younger brother Samuel was appointed as Second Lieutenant and John Franklin served as one of the midshipmen; all including the Captain, hailed from Lincolnshire on the east coast of England. The civilians onboard included Crosley, the astronomer, whose return to England from the Cape of Good Hope due to illness was to throw a considerable burden of celestial observations on the Captain and his brother. William Westall, a student at the Royal Academy School in London, was the official landscape painter; Ferdinand Bauer, a German botanical painter, was sent onboard by Sir Joseph Banks, who also selected a naturalist, Robert Brown, a graduate of Marischal college, Aberdeen, with an assistant Peter Good, who brought onboard a portable greenhouse to preserve the plant collection. John Allen, a miner, would collect the geological samples.

Just before sailing from Portsmouth in 1801 Flinders met John Thistle, a seaman who had accompanied George Bass to Westernport in *HMS Reliance* and Flinders for the circumnavigation of Van Diemens Land in *Norfolk* where he had proved himself an excellent man. Although Thistle had only been home for three weeks after six years abroad he willingly accepted the post of Master of *Investigator.*

Flinders had modelled himself on Cook in more ways than in surveying. As he sailed towards the Cape of Good Hope Flinders wrote in his journal: *'At this time we had not a single person in the sick list, both officers and men being fully in good health, as when we sailed from Spithead. I had begun very early to put into execution the beneficial plan, first practised and made known by the great Captain Cook. It was in the standing orders of the ship, that on every fine day the deck below and the cockpits should be cleared, washed, aired with stoves, and sprinkled with vinegar. On wet and dull days they were cleaned and aired, without washing. Care was taken to prevent the people from sleeping upon deck, or lying down in their wet clothes; and once in every fortnight or three weeks as circumstances permitted, their beds, and the contents of their chests and bags, were opened out and exposed to the sun and air. On Sunday and Thursday mornings, the ship's company was mustered, and every man appeared clean shaved; and when the evenings were fine, the drum and fife announced the forecastle to be the scene*

Matthew Flinders (by Helena G. de Courcy 1814, after unknown artist)

of dancing; nor did I discourage other playful amusements which might occasionally be more to the taste of the sailor, and were not unreasonable.'

For nearly 200 years ships bound for the East Indies, after rounding the Cape of Good Hope ran along the latitude of 40º South before fair westerly winds until their longitude was deemed sufficiently great for them to turn northwards for Sumatra or Java. Hence in the days before timekeepers it was not unlikely that the vessels, mostly Dutch, carried on too far to the east and thus on their way northward sighted the barren western shores of the continent. In 1627 The Dutch *Gulde Zeepaard*, carrying a wealthy merchant Pieter Nuyts, overran the longitude more than was usual and explored a thousand miles of the southern coast before turning back.

Throughout the seventeenth century vessels of the Dutch East India Company were constantly probing eastwards from Timor along the south coast of New Guinea and circling southwards around the Gulf of Carpentaria. But the Dutch kept their secrets and in England it was yet by no means certain whether Carpentaria was a gulf or a wide strait dividing New Holland from New South Wales, the whole eastern coastline of which Cook had laid down in his voyage in *Endeavour* 30-odd years before.

There were major problems to solve, and details to be filled in, so that their Lordships' instructions to Flinders called for complete examination of the entire Australian coastline. It was a mammoth task. Using a holograph Memoir, compiled by Flinders whilst on the Isle de France, one is able to study his survey techniques. They consisted of running surveys, the name given to the method of laying down a coastline from a ship passing along offshore whilst keeping careful records of her position so that features along the shoreline, or inland mountains or hill peaks, could be fixed in relation to the ship's track by cross bearings taken with the magnetic compass.

The 'rough charts' were always plotted on the same day on which the land had been seen, the scale being 1 inch to 4 geographic miles. Whilst the ship lay in harbour or was sailing far offshore Flinders re-plotted the coastal surveys using his log-book, his latitude book, his longitude book and his compass bearing book, the observations in the last two being corrected according to the rates of chronometers and magnetic variation respectively found at the shore observation spots which formed the terminal points of each coastal traverse. These fair coastal sheets were plotted on a scale of 4 inches to a degree of longitude; but for harbour sheets, or in particular places requiring a larger scale, 12 inches to a degree of longitude was usually adopted.

A number of symbols had been developed by the early navigators to indicate shoals, rocks, unsurveyed coastlines &c., but Flinders went further. *'A first and principal deviation from former usage', he writes in the Memoir, 'is the distinction made between the night and the day track. It is obvious that a ship may pass near to rocks, reefs, or lone islands in the night without seeing them, and consequently without being able to lay them down in a chart, and as the generality of ships follow a former route with confidence, this might occasion many disasters. During the day, then, when every neighbouring object above water was distinguishable and could be laid down, the* ***Investigator's*** *track is represented by a small* ***continued*** *line, but to point out the uncertainty attending the track at night, a* ***broken*** *line is then used, not much unlike dotting; and the same is done in very thick weather, when objects could be no better seen than at night.'*

Flinders then added a number of special symbols he used along the tracks some of the most important of which were as follows:

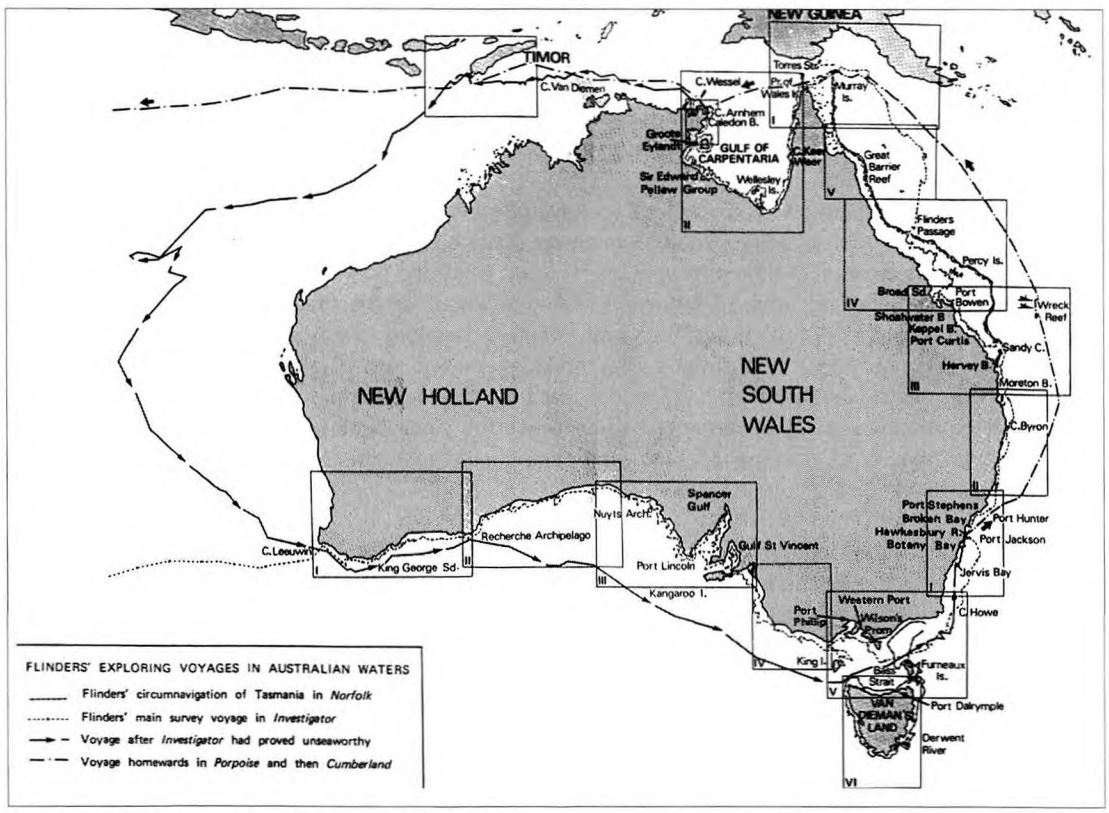
- The position of the ship at noon, according to the latitude from an observation of the Sun. This was taken with a sextant (one Ramsden 8 in. and three Troughton 6 in. sextants were carried) and if the altitude of the Sun was more than 50º and less than 85º it was the constant practice to observe the altitude of the lower limb and the supplement of the upper limb at the same noon, with the same

instrument and standing on the same place, and to take the mean of the results for the true latitude. The only corrections necessary to apply to such observations were parallax and refraction

- Showed the position of the ship at noon according to dead reckoning when sights were unobtainable Chr. or TK. – the position of the ship for longitude by means of one or more timekeepers. If it occurs on the solid day track the observation is from altitudes of the Sun, but if on the dotted night track the altitudes of a fixed star were used. In order to show the prevailing winds at the time the ship passed along the various parts of the coast, a system of differently feathered arrows were used to indicate the forces and directions from light airs to hard gales. A somewhat similar system was used to show the directions and speeds of the currents encountered. 'Az' or 'Amp', signifying azimuth or amplitude observations of the Sun appear at intervals along the track, together with the variations as found and the ship's head at the time, for Flinders had realised that iron within the vessel itself had an affect upon the compasses and in time he was able to reduce all these variations to what they would have been with the ship's head in the magnetic meridian and the effects of internal iron at a minimum. He used the anchor symbol to indicate where the ship had lain at anchor, but with true surveyor's caution went on to say *'it must not be understood that these anchorages are always securely sheltered'*

Longitude posed a complex problem for those carrying out running surveys at the turn of the eighteenth and nineteenth centuries. Flinders carried on board four chronometers, two by Earnshaw and two by Arnold, the rival clockmakers of London. Time in relation to Greenwich Mean Time could be carried by these timepieces, and converted to longitude by meridional observations of the Sun, but even the finest chronometer has a gaining or losing rate so that it was necessary to land the chronometers from time to time to make the necessary observations to find longitude and to ascertain their going rates.

One can visualise the running survey as being composed of a series of traverses which had subsequent-



Map of Flinders voyage in Australian waters (drawn by Juliet Fisher)

ly to be corrected according to the results of the terminal observations. For instance the longitude of Simon's Bay, Cape of Good Hope, from where Flinders took his departure on 2 November 1801, had been well established by the Abbé de la Caille using Cassini's method of occulations of Jupiter's satellites and Mason who had observed the transit of Venus at the Cape. Neither of these results relied upon carrying time from Paris or Greenwich and differed from each other by only 8 seconds of longitude. Here Crosley, before leaving the ship, had established the rates of the *Investigator's* chronometers during 7 days' observations of equal altitudes of the Sun using a mercury horizon with a Troughton's sextant. On the day before sailing Flinders made a final set of observations for chronometer rates and obtained their individual errors on Greenwich Mean Time before the ship set out across the Southern Indian Ocean.

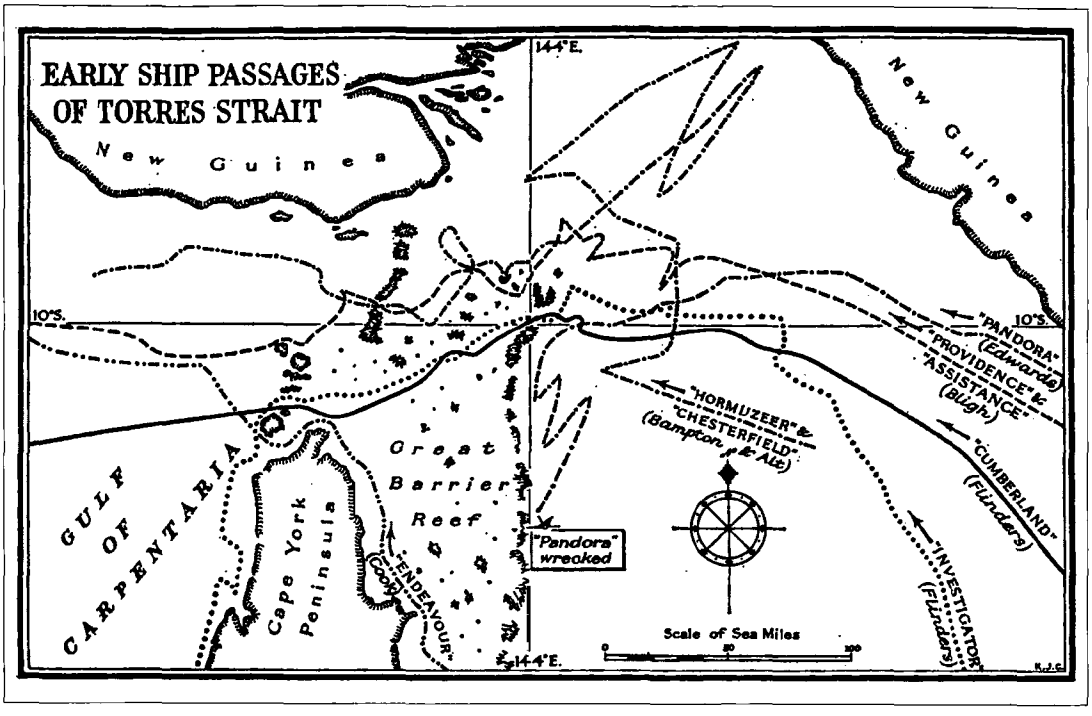
On the evening of Sunday 6 December Cape Leeuwin was sighted to the north-east and the next morning two sights were taken to fix the longitude by timekeepers and a noon meridian altitude obtained so that Cape Leeuwin, now 10 miles to the north-west, could be laid down in its position. The running survey commenced in a south-eastward direction along the coast.

King George Sound with its two harbours had been visited by Vancouver on his way to the North East Pacific in 1791 and Flinders planned to use this harbour for his first traverse terminal. The Eclipse Islands, sketched by Westall, were sighted on the evening of 8 December and course was altered to the north-east for Bald Head which marked the southern side of the entrance of the Sound. Although dark, the night was fine, and with the aid of Vancouver's chart Flinders was able to bring the ship to anchor to the east of Seal Island. It was 4 days before the westerly wind came round to the east and enabled Flinders to take the ship over the 4-fathom bar under topsails into Princesse Royal's Harbour to anchor.

Whilst refitting of the masts and spars began, watering and wooding parties were sent out, the naturalists and artists landed to explore and the tents were erected for the observers on the shore nearby, and of which Samuel Flinders was in charge. The latitude of the tents was found to be 35° 02′ 07″ from three meridian zenith distances of the Sun observed with Ramsden's universal theodolite, and the longitude observations were begun. From 12 December until New Year's Day eight sets of distances of the Sun east and west of the Moon known as lunars, were taken by Matthew and twelve by Samuel, which, worked out using Mayer's tables, gave a mean longitude of 117° 59′ 06″ east from Greenwich.

On 15 December equal altitude observations for longitude were taken with each chronometer in turn and having been meaned and compared with the longitude obtained by the lunar method gave a total error of 3′ 21″.1 east. The interval of time between 1 November, when the final observations had been taken at the Cape, and 15 December was 43.7 days. It had to be assumed that the timekeepers had increased their combined error steadily, so that a mean rate of 4″.6 eastward longitude per day was accepted. By this daily proportion all observations made from the Cape Leeuwin landfall onwards to King George Sound had to be appropriately corrected before Flinders could lay down his fair plot and delineate the coastline. Meanwhile the routine of daily observations to ascertain the going rates of the chronometers had to be continued until the tents, timekeepers and instruments were re-embarked, this being always the final activity before taking up the running survey again.

The next leg was a short one, for sailing on 4 January Flinders was in a labyrinth of islands and shoals towards nightfall on the 9 January, unable to find a clear passage to seaward. Consulting with Thistle, the Master, they decided to run before the southerly wind inshore to where some sandy beaches appeared. This proved successful and by 7 pm *Investigator* was at anchor in a sheltered bay – so Lucky Bay was named. Although only 5 days were spent here this was long enough for latitude and longitude observations, chronometer rating and observations for magnetic variation onshore. These latter consisted of amplitudes at sunrise and sunset with three different landing compasses, with Walker's meridional compass and the surveying theodolite with its magnetic compass attachment. Meaned, the observations gave the variation as 3° 6′ west and Flinders applied to a round of theodolite angles to all the off-lying islands and reefs which he could see from the top of the hill behind the bay.



Torres Strait

The commencement of Flinders' Australian survey has here been treated in considerable detail in order to demonstrate the methods he was to pursue throughout his entire survey of the Australian coast. To see how the sketch surveys of the harbours were made, as opposed to the coastal surveys, it is now necessary to press on much more quickly to the eastward.

On Saturday 20 February *Investigator* was passing through a 4-mile wide passage between the mainland and an off-lying island. A south-east wind combined with the strong south-going tidal flow causing overfalls encouraged all on board to believe that either a great river or a strait leading through to Carpentaria lay ahead. The ship was anchored to the west of a large island, which being explored on Sunday by Flinders, in the company of the Master, he named Thistle's Island. That same evening Thistle was sent over to the mainland in the cutter with a midshipman and six men in search of water, but although he was seen returning under sail at dusk he never reached the ship, he and his crew apparently falling prey to the overfalls which had so recently aroused enthusiasm. Night and day searches revealed nothing but flotsam from the cutter. Cape Catastrophe and Memory Cove will commemorate forever this first great misfortune of the voyage.

Whilst climbing the hills to search by eye for evidence of survivors from the cutter a great expanse of water had been seen to the north, and this fine harbour which Flinders named Port Lincoln, was entered by the *Investigator* north of Cape Donington on Thursday 25 February 1802. The ship was eventually moored at the extreme western end of the harbour where Samuel Flinders erected his observing tents and pits were dug successfully for fresh water.

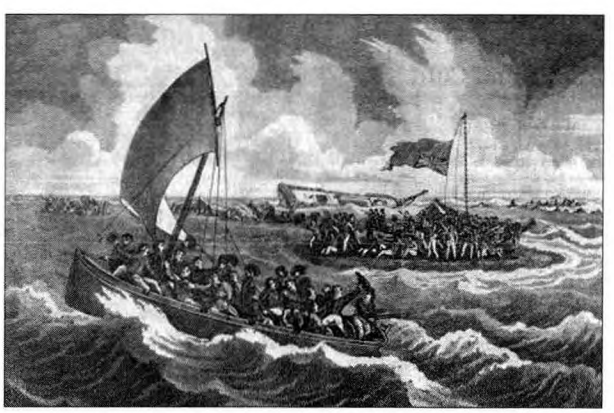
Meanwhile Flinders put in hand a survey of the harbour. A base was measured by sound from the ship to the south-east point of Boston Island. A gun was fired three times at pre-arranged intervals on board the ship, whilst on the island Flinders measured the time between the flash and the arrival of the sound by counting the swings of a pendulum consisting of a musket ball at the end of a piece of twine of such a length (9.8 inch) that each swing took half a second. Speed of sound being taken as 1142 feet per second, eighty-five swings of the pendulum gave the length of the base as 8.01 miles.

Theodolite observations from either end of the base intersected the peak of Boston Island, Stamford and North Side Hills, high points from which theodolite angles were taken to intersect and fix the many features around the harbour. The few lines of soundings taken by the ship and boats were fixed by pocket compass bearings. Station pointers, although being manufactured by Troughton in 1800, do not appear to have been used by Flinders.

The gulf which stretched away northward proved a disappointment when it terminated after 185 miles of exploration. A second gulf proved even less extensive, but by naming them Spencer and St Vincent, and the peninsula dividing them Yorke, Flinders flattered three successive First Lords of the Admiralty at a stroke.

It was now April 1802 and Flinders decided that with the onset of winter he must press on to Port Jackson. On 8th April *Investigator* encountered at sea the French exploring vessel *Le Géographe* under the command of captain Nicholas Baudin who had lost contact with his consort *Le Naturaliste* during a gale in Bass Strait. Relations between Flinders and Baudin were cordial and they looked forward to meeting again at Port Jackson. His entry into Port Phillip is worthy of comment, but in fact Lieutenant Murray in the tender *Lady Nelson* had discovered this spacious harbour only 10 weeks earlier.

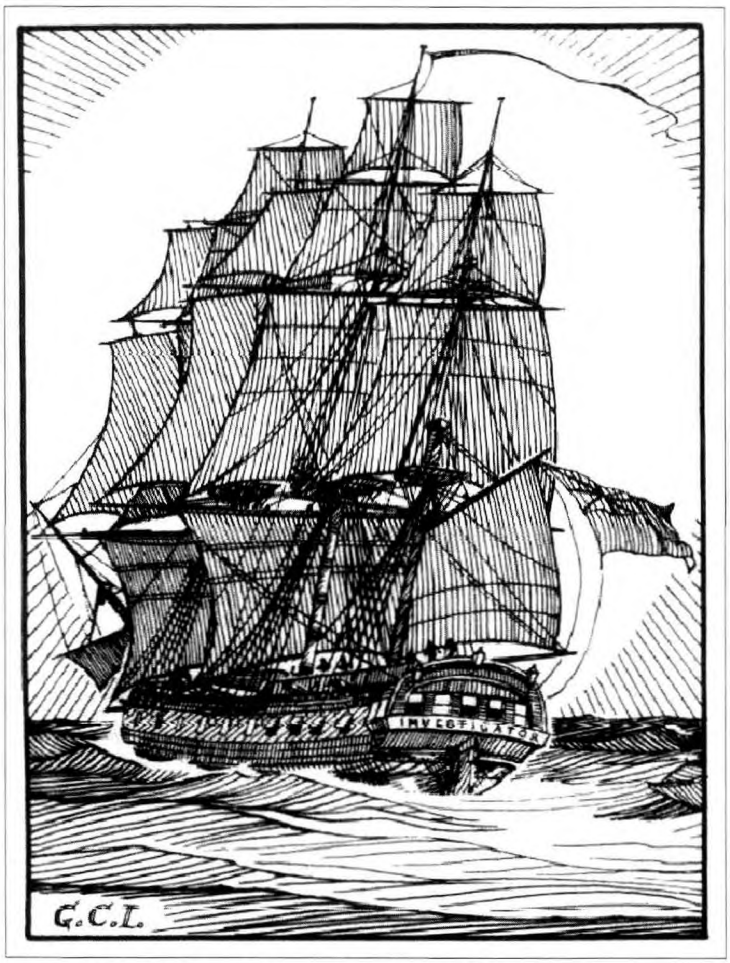
Investigator arrived at Port Jackson on 9 May, remaining there refitting and preparing for the next part of the voyage until July when she sailed northwards with the tender *Lady Nelson*, which had been sent out from England for survey work and was now under the command of Lieutenant Grant. During Flinders' stay in Port Jackson both Baudin's ships, *Le Géographe* and *Le Naturaliste*, were welcomed and given succour. Flinders was now following in Cook's *Endeavour* tracks. 'He reaped the harvest of discovery, but the gleanings of the field remain to be gathered,' wrote Flinders. With John Aken, the new Master who had joined at Port Jackson, in the boat searching ahead for the channel, *Investigator* rounded Breaksea Spit off Sandy Cape, passed within the shallow reef-protected water and anchored to await the lagging *Lady Nelson* which, an indifferent sailor, was commanded by an officer 'not accustomed to make free with the land'. Sailing too far offshore in search of safety, Grant had been hindered by a strong south-going stream.



Flinders leaving Wreck Reef in Dolphins boat (by unknown artist 1808)

The coastal survey proceeded on the lines Flinders had established, an observation spot being finally established in Broad Sound. Flinders then decided to quit the coast to find and pass to seaward through a break in the Barrier Reef and make direct for Torres Strait by the open sea in an effort to complete the passage before the onset of the contrary north-west monsoon. It took 14 days to find a gap, sailing and searching by day, dragging anchors by night, for the tidal streams flowed at alarming rates through the tortuous passages between the reefs, which formed not a solid barrier but a great loosely scattered jigsaw pattern, green-covered at high water, brown and black-studded with 'coral heads' at low. Shadows thrown by the clouds made their own 'reefs' as did the eddying of the tidal stream. With one eye on the whaleboat sounding ahead, and the other on the *Lady Nelson* struggling astern, Flinders crept onwards until at last he thought he had found an opening. Here he took the decision that had been formulating in his mind and ordered Lieutenant Grant to return with his vessel to Port Jackson; but hardly was the brig out of sight than white water ahead once more showed that *Investigator* was still within the reef. Two further days of trial and near error resulted before Flinders felt the open ocean heave beneath him – he had passed through 'Flinders Passage'.

Flinders as a midshipman, had sailed through Torres Strait in *Providence* with Captain William Bligh on the second breadfruit voyage and since then had studied the details of the few other passages which had been made and was now resolved to see how expeditiously the passage might be accomplished. He entered by 'Pandora's Entrance' on 29 October 1802, lay two nights at anchor and reached Prince of Wales Island on the afternoon of the 31st and, had he wished, could have passed clear of Booby Island before dark. Thus the perilous and lengthy passage of a few years previously had been cut by Flinders to 3 days. This was one of his greatest services to mariners for it reduced the time of sailing from Port Jackson to Java Head, whence a good departure for the Cape had to be taken, by no less than 40 days: moreover his chart made his safe passage comparatively easy to follow.



Investigatator under full sail (drawn by G.C. Ingleton)

Now began the arduous and lengthy task of sailing around and delineating the whole coasts of the great Gulf of Carpentaria, a coastline so remote that to this day some of the details shown on modern charts stem direct from Flinders' work. It was whilst in the Gulf that a leak in the ship's hull developed and increased to such an extent that while the ship lay at anchor off Sweer's Island Flinder ordered the boatswain and the carpenter to examine and report on the hull. They found many of the timbers completely rotten and judged that the vessel was rapidly becoming dangerous – they gave her 6 months of life.

It took Flinders 3 months to complete the survey of the Gulf of Captentaria, after which, in view of the state of his vessel, he decided reluctantly that he would have to abandon his plans for charting North West Australia, which the East India Company had particularly requested, and sail via Kupang for Port Jackson.

At Kupang some of his crew, exhausted as they were, contracted dysentery and eight died including Mr Good, the gardener, as the vessel sailed far off the coast and clear of dangers on the long voyage back to Port Jackson which was reached on 9 June 1803.
With this unhappy turn of events Flinders' great surveys really terminate, but his subsequent adventures during his attempts to reach England with his charts must be briefly told.

Investigator being quite unfit for further service the Governor, Philip Gidley King, provided Porpoise for Flinders' passage home, appointing Fowler to command her. A greenhouse was erected on deck to accom-

modate the collection of plants transferred from *Investigator*. *Porpoise* sailed in company with two merchantmen *Bridgewater* and *Cato*. Sailing for Torres Strait in the open sea well to the eastward of the Barrier Reef, disaster overtook them on the night of 17 August 1803. First *Porpoise*, then *Cato*, struck an unknown reef, the ships' companies spending an agonising night fearful of the heavy breakers before the great majority were able to escape in boats to a low island about a mile away. Here they erected tents of sailcloth and collected salvaged provisions from the wrecks. As *Bridgewater* had strangely sailed on, the survivors were faced with an indefinite sojourn on a completely barren stretch of coral sand more than 100 miles from the nearest known land.

At Fowler's suggestion Flinders set out with the commander of the *Cato*, and a picked crew of 14 men, in a cutter for Port Jackson in search of help, leaving behind him his treasured charts and journals which had taken so long and so much labour to compile. Governor King was surprised at his dinner 3 weeks later by two unshaven and sunburnt officers who came to Government House to tell of their misadventures. He at once arranged that the ship *Rolia* would be ordered to call at Wreck Reef on her passage to Canton where the survivors from *Porpoise* and *Cato* would find a passage home to England. To Flinders the Governor gave a small colonial schooner named *Cumberland* so that he, with a dozen volunteers from his former crew, might pass through Torres Strait and sail direct for England with the precious charts and journals.

Six weeks after Flinders had left Wreck Reef in the cutter he was being cheered as he stepped ashore on the reef from *Cumberland* to experience one of the happiest days of his life.
Samuel Flinders, with only one chronometer still in going order, had taken a set of no less than sixty lunars on Wreck Reef, which gave Flinders an excellent departure when he sailed away in *Cumberland* for Torres Strait, the passage of which was mere routine to Flinders now.

Calling at Kupang, Flinders took his departure for the Cape, but once in the long swell of the open ocean *Cumberland* began to take in water at a speed faster than her worn pumps could cope with. The hull would have to be caulked and the pumps re-bored long before she could reach the Cape, and so Flinders decided to call in at the Ile de France (Mauritius) and seek French assistance, unaware that England and France were again at war.

Governor Decaen did not accept Flinders' passport, made out as it was for the *Investigator*, and placed him and his crew under arrest. Flinders may not have helped matters by haughtily refusing an invitation to dinner from Madam Decaen. Suffice it here to say that Flinders remained a virtual prisoner in the Ile de France for the next 6½ years during which England was deprived of one of her greatest chartmakers of which she was increasingly in need.

Flinders was allowed to have access to his papers, most of his journals and his charts which latter he painstakingly redrew so that today the majority of his original works in the British Hydrographic Office archives bear the legend 'Drawn on the Ile de France'.

The note on one of these originals reads as follows:

> *'Mauritius Feb 10/1804*
> *The decay of the* ***Investigator*** *having prevented me from making a survey of Torres Strait I humbly offer this chart as a substitute until that can be accomplished. My imprisonment affording me sufficient leisure, in order to make the chart more useful I have added the track of Captain Bligh and completed the Strait from the best materials in my possession. The parts near Cape York which are lightly touched and the adjoining soundings written at right angles to the face of the chart are from Captain Cook. All other parts south of the circumflexing line belong to the* ***Investigator*** *and* ***Cumberland,*** *except the Pandora's Reef and Jones Shoal. The lands and reefs represented by the double lines and the soundings near them written at right angles are from Mr Bampton's three charts published by Mr*

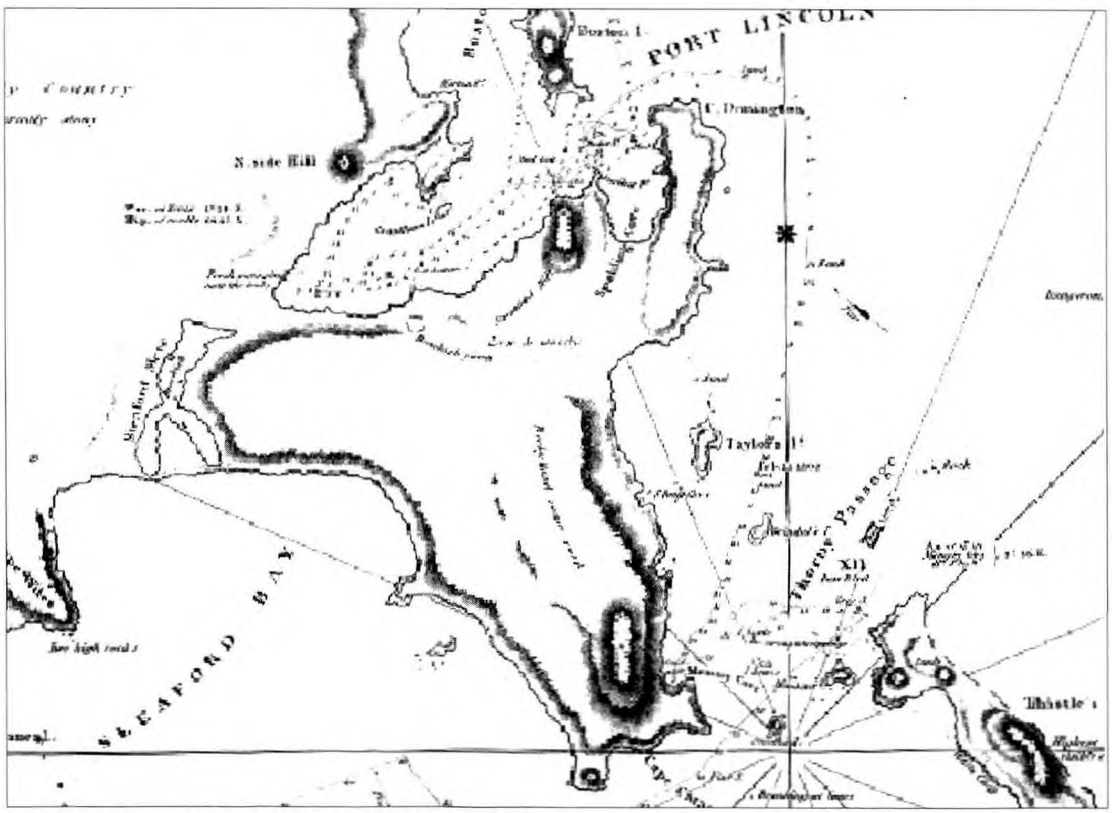
Dalrymple in 1798 and 1799. I much wish that a more correct delineation and arrangement of these parts had enabled me to incorporate more of this valuable information with what is laid down by Captain Bligh and the ***Investigator****. From Captain Bligh's chart are borrowed all the other lands and reefs on the north side of the circumflexing line, and the accuracy of this part is not to be doubted. See the account of these combinations annexed to the chart.*
Matthew Flinders'

The long sojourn in captivity had a bad effect on his health and he was a sick man when he returned to England. The reunion with his wife after nearly 10 years' absence is touchingly evoked in a letter by John Franklin who had come to meet Flinders in London.

'My Dear Sir,
Some apology would be necessary for the abrupt manner I left you, except under the peculiar circumstances that my departure was taken. I felt so sensibly the affecting scene of your meeting Mrs Flinders that I could not have remained any longer, in the room, under any consideration....'

In the very few years remaining to them Anne nursed him as he wore himself out in a stupendous effort to complete and publish his two-volume book *A Voyage to Terra Australis* and the accompanying atlas of charts engraved by Arrowsmith.

A daughter was born before Flinders' death in 1814 at the age of 40; a grandson was to become the famous Egyptologist William Matthew Flinders Petrie. The proofs of his book he undoubtedly saw a few weeks before his early death. Sales of the book fell short of the cost price by £50 which his widow had to find.
In the three closing years of his life Flinders had also found time for carrying out a number of experiments



Part of Flinders' chart of the approaches to Port Lincolm

in Royal Naval vessels in an attempt to reduce the effect of iron within the ship upon the compass. He had realized the importance of keeping movable metal away from the vicinity of the compass and discovered that the effects of the iron in the ship's holds or structure forward of the poop could be counteracted to a large extent by a vertical soft iron bar close abaft the compass. That the 'Flinders Bar' today is on the foreside of the binnacle merely reflects the changed position of the modern magnetic compass which is usually sited on the navigation bridge well forward. The Flinders Bar, of which every young seaman is soon made aware, is perhaps a most fitting memorial to this great hydrographer.

The state of hydrography at the turn of the eighteenth/nineteenth century differed entirely from what we know today. The British, and the French particularly, were sending naval expeditions to distant parts of the world to explore and to lay down on charts the coastlines they discovered. Cook and Bougainville were the pioneers, others followed their methods. But neither pioneers nor the competent navigators who followed during the next 50 years, were capable of making nautical charts as we know them today. They spent little time off those distant shores, nor did they have the expert assistants and the equipment for refined surveying. Flinders' techniques were those of Cook in the Pacific, handed on by Bligh – the running coastal survey to lay down newly discovered coastlines, and the sketch surveys of safe harbours, increasingly used by the explorers as terminal points of their coastal traverses, whilst each in turn improved the accuracy of their latitude and longitude positions.

Navigators used the charts of Cook and Flinders for making and recognising landfalls, for navigating little travelled waters such as the Bass and Torres Straits, and for finding secure anchorage; but unless they followed directly in the tracks sailed by the chartmakers they risked disaster on undiscovered dangers, particularly by night.

Flinders was an unlucky man, and perhaps one of his unluckiest blows was the loss of Crosley, his Astronomer, at the Cape, for he and brother Samuel had to spend nearly all their time at anchor, and much time at sea, in making the astronomical observations for positioning the surveys. Thistle was the only other man on board with surveying experience, and once he was lost the surveying capability of the expedition was seriously reduced.

Perhaps it is as an exploring navigator that Flinders should be best remembered. Only once in all his voyages in unsurveyed waters in *Tom Thumb, Norfolk* and *Investigator* did Flinders ground his vessel, and that was on an uncharted shoal off Dungeness. When *Porpoise* struck Wreck Reef, Flinders was neither in command nor on deck, although it is only fair to say that he discussed the night's tactics with Fowler the evening before the disaster and did not disagree with Fowler's plans to run on through the night under easy sail.

I will conclude with a quotation from Flinders' journal which to me epitomises his immaculate approach. He is discussing how to find a passage through the Barrier Reef. *'The Commander who proposes to make this experiment must not, however, be one who throws his ship's head round in a hurry, as soon as breakers are announced from aloft' if he does not feel his nerves strong enough to thread the needle, as it is called, amongst the reefs, whilst he directs the steerage from the masthead, I would strongly recommend him not to approach this part of the coast of New South Wales.'*

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