EXTRACTS AND REVIEWS.

CAPTAIN JAMES COOK

(1728-1779)

by

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James COOK was born on the 27th October, 1728, in the little village of Marton, in that part of Yorkshire known as Cleveland. His father was then a farm labourer and lived in one of the mud huts common in that neighbourhood. Up to the age of thirteen James, who was one of a family of nine children, was employed about the farm. Mary WALKER, the wife of a wealthy yeoman of Marton, seems to have taken the trouble to teach the child to read, but later he was sent to school at Great Ayrton, where he learnt writing and arithmetic, and we are told displayed "a very early genius for figures".

In January, 1745, young James was apprenticed to a Mr. SANDERSON, who kept a combined grocery and drapery shop in the fishing village of Staithes. We can visualize Mr. SANDERSON's apprentice employed upon his duties, rising early from his bed under the counter, sweeping and cleaning, laying out the goods — his breakfast probably a hunch of bread, a lump of fat bacon and a mug of ale. This despatched, all day long he would fetch, carry, wait, serve and listen to the instructions of Mr. SANDERSON. He would also listen whenever he could to the talk of the sea-faring men on the Staithes wharf, and hear many things both strange and wonderful. To many British boys, when they hear stories of the sea, there comes to them a longing so mighty it overpowers them, and a call not to be resisted causes them to betake themselves to some place where they, too, can become sailors, for good or for evil.

At the time of which we are writing it would be mostly for evil, for in those days a seaman had conditions to contend with the like of which are now entirely forgotten; there was scurvy, clumsy ships, worm-eaten bottoms, foul water, rotten salt junk, weevily biscuits, often rations were short; there were Captains who could, and sometimes did, have the flesh lashed off a seaman's back; there was the enemy afloat and there were sharks ashore — yet James COOK, fortunately for his Country, answered the call of the sea, and one night when all was quiet, ran away to the port of Whitby, some ten miles distant, arriving there in the early morning to find work in full swing about the harbour and quayside.

Whitby then was a busy and important place, it had a population of nearly ten thousand; many ships were built there and employed principally in the coal trade around the coast, and in trading to the Baltic and elsewhere.

Young COOK boldly went on board the collier brig *Freelove*, bound for London and then ready for sea, being taken on as ship's boy. He must have given satisfaction for the Mate interested himself in him and got him bound apprentice to the owners of the ship, two Quaker merchants, brothers, named John and Henry WALKER.

Between the years 1746 and 1755 COOK sailed in various vessels, mostly employed in the East Coast coal trade — which has been the nursery of many fine seamen. Ships in which he is known to have served were *Three Brothers* of six hundred tons, which voyaged further afield to Liverpool, Dublin, Deptford and Norway; also the *Friendship*, of which vessel he was appointed Mate in 1752, and remained in that capacity until May, 1755, when war with France being imminent he resolved to join the Royal Navy; to use his own words "having a mind to try my fortune that way". COOK was then twenty-seven years of age, and he made his way to Wapping where he was entered as an Able Seaman on board H.M.S. *Eagle*, sixty guns, Captain John HAMER.

From the time of his joining the King's service until May, 1759 is a blank space in our history of COOK's life. *Eagle* formed part of the fleet in American waters, and under the command of Captain (afterwards Sir Hugh) PALLISER, took a full share in the numerous actions of the time. The French were heavily defeated in the West Indies, and in 1758 PALLISER was at the taking of Louisburg and in the reduction of the Island of Cape Breton. The islands of Guadaloupe, Desirada and Marie Galante were also taken before *Eagle* returned to England in 1759.

What share COOK had in these actions is not known, but it seems certain that he must have received some promotion from the forecastle to the quarterdeck, for with his knowledge of practical navigation and previous experience as an Officer, he would no doubt have been told off to assist the Master, probably to act as a Master's Mate.

A word of explanation regarding a Master in the Royal Navy in COOK's time will be of interest. The post of Master was the survival of the sixteenth and seventeenth century practice of appointing as Captain of a war-ship, a soldier who had no knowledge of navigation, but was to command the ship and the fighting. The duties of the Master, as laid down in the Sailor's "Vade Mecum" were briefly "To navigate the ship under the directions of her superior officer, to see that the log-book was kept, to inspect all stores and provisions, to stow the hold, trim the ship, take care of the ballast, to observe coasts, shoals and rocks, and to sign vouchers and accounts". His scale of pay varied from £4 a month on board a Sixth Rate to £9 a month in the First Rate.

On *Eagle*'s return, Captain PALLISER strongly recommended COOK, and he was raised to the rank of Master, being appointed to H.M.S. *Mercury*, which vessel joined the Fleet under the command of Sir Charles SAUNDERS, who in conjunction with the land forces under General WOLFE, was engaged in the siege of Quebec. A survey of St.Lawrence River was in progress, and COOK was detailed to assist, and so well did he carry out this work that he was chosen to perform a most difficult and dangerous service.

In order to enable the Admiral to place ships against the enemy's batteries and to cover our Army in a general attack which WOLFE intended to make, it was necessary for soundings to be taken between Orleans Island and the north shore, directly in front of the strongly fortified camp at Montmorency and Beauport. As this stretch of river was constantly under fire the operation had to be carried out during the night, and for several nights COOK and his sounding party worked through the hours of darkness, being at length discovered by the enemy who almost succeeded in capturing them; but with the precious soundings record in his possession, COOK and his men leaped ashore on to Orleans Island, having to abandon their boat to the French — a small matter, as the Admiral was furnished with sufficient information of the Channel to enable the British ships to manœuvre in safety from grounding.

At the attack on Montmorency, COOK was entrusted with the piloting of the boats, and he also conducted the embarkation to the Heights of Abraham. Such were the services which COOK performed within a few months of his appointment as Master, and it seems certain that such important work would not have been entrusted to a man unless he possessed special aptitude for it.

After the capture of Quebec, COOK was transferred to H.M.S. *Northumberland*, the flagship of Lord COLVILLE, and here followed his first notable piece of independent work, a detailed charting of the River and Gulf of St. Lawrence. He laid numerous buoys, and upon the publication of the chart his reputation as a skilful marine surveyor was made.

In the autumn of 1762, *Northumberland* returned to England, and on December 21st of that year, COOK married Elizabeth BATTS, at Barking, Essex. Their home life together cannot have lasted more than about four years in all, but the marriage is said to have been a very happy one. The house in which they lived has since been identified as N° 88 Mile End Road, London, E., which now bears a tablet recording the fact. During his later wanderings all over the world, Mrs. COOK must often have been years without news of her husband, such was the life of a sailor's wife in those days.

Four months after his marriage, COOK's services were applied for by Captain GRAVES who had obtained a grant for the survey of Newfoundland, and in April, 1763, COOK went out and surveyed the islands of St. Pierre and Miquelon, afterwards returning to England. His old captain, now Sir Hugh PALLISER, having become Governor of Newfoundland and Labrador, arranged for COOK to be appointed as Marine Surveyor of those shores, and the *Glanville*, a schooner, was placed under his command, and in April 1764, he sailed for his station. Every Autumn he returned to England, and every Spring he went out again; this is proved by the dates of his children's births. The survey lasted until the year 1767, and during these four years he carried out a great amount of surveying, his charts of Newfoundland and Labrador not being wholly superseded till a comparatively recent period. Many of the marks which he erected for surveying purposes are still visible and recall the memory of their author. COOK also began to make his reputation as an astronomer and mathematician, by observing an eclipse of the sun, his results being communicated to the Royal Society in a paper entitled "An observation of an Eclipse of the sun at the Island of Newfoundland, 5th August, 1766, with the Longitude of the Place of Observation deduced from it".

The name of James COOK was now favourably known in two important quarters — at the Admiralty and by the Royal Society — and it was due to this conjunction of COOK's own talents and to circumstances, that the decisive step was taken which made him the greatest of Nautical Explorers.

In the autumn of 1767 COOK returned home, his work on the northeast coast of America completed, and thus the second chapter of his life may be said to have closed. He was now thirty-nine years of age, but the best part of his life was before him, all its honour, its highest interests, its greatest rewards. The man was now ready, his chance came to him and he proved himself equal to his fortune.

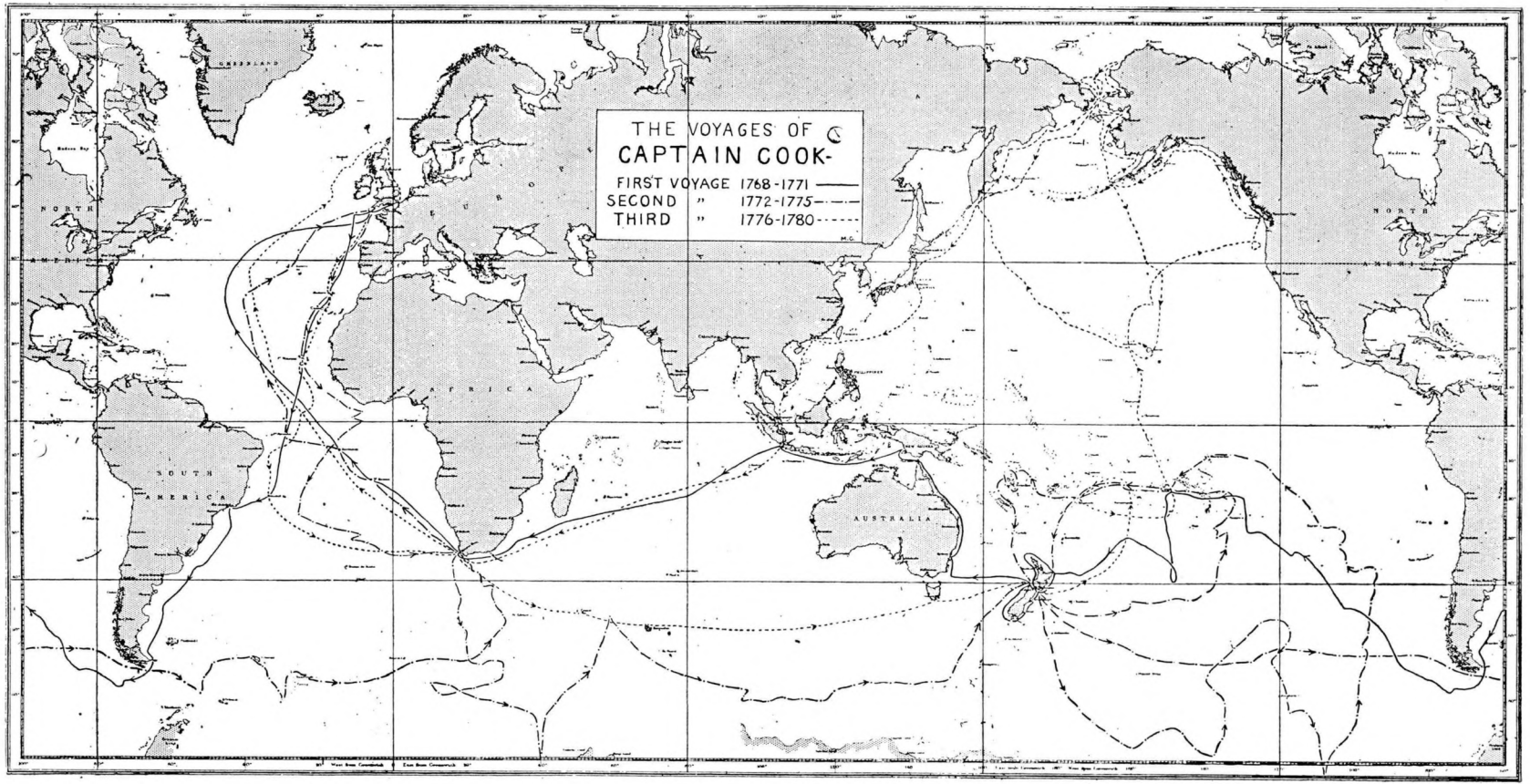
The Royal Society, discovering that a transit of Venus over the Sun's disc would occur on June 3rd, 1769, and that this event would be best observed from a position in the central South Pacific Ocean, drew up a memorial to King George the Third, praying that an expedition might be sent out, as the occasion was important for both Astronomy and Navigation. The Crown agreed to provide the expenses and the Admiralty a ship. Mr. Alexander DALRYMPLE, a well-known student and writer on Geography, and Fellow of the Society, was proposed to take charge of the scientific work, and consented to go, but finding that he would not also be in command of the ship, he refused the appointment. The Admiralty then cast about for an Officer who could not only command the ship, but also conduct the scientific purposes of the expedition. Their choice fell upon James COOK, Master in the Royal Navy, then home and available. Mr. STEPHENS, Secretary to the Admiralty, recommended him, and he was promoted to the rank of Lieutenant and appointed to command the expedition.

The choice of a suitable ship being left in COOK's hands it is not surprising to learn that it was a collier, built by his old friends of Whitby. The *Endeavour*, a cat-built barque of 368 tons, had round bluff bows and a deep wide waist, tapering towards the stern; she was four years old and from her roominess and excellent qualities as a sea-boat, particularly well fitted for the work of exploration which was to the carried out in addition to the observation of the transit. Her build and draught also permitted her to take the ground or be laid on shore with more safety than other vessels of equal size. She was sent to Deptford Dockyard for fitting out, and COOK had the copper sheathing replaced by wood, as repair to copper was more difficult. The voyage was expected to occupy two years and she was victualled for eighteen months, and took on board ten carriage guns and twelve swivel guns, with good store of ammunition and other necessaries.

The complement of Officers and men of H.M.S. *Endeavour* totalled eighty-five and consisted of Lieutenant COOK in command, two Lieutenants, a Master and two Mates, three Midshipmen, Surgeon and Mate, Gunner, Clerk and Steward, Carpenter and Mate, Armourer, Boatswain and two Mates, Sailmaker, COOK, two Quartermasters, forty-one Able Seamen, twelve Marines and nine Servants.

A party of Scientists also accompanied this expedition, and accomplished very much for the benefit of Natural History during the voyage. They consisted of Charles GREEN, one of the Assistants at Greenwich Observatory, Joseph BANKS, F.R.S., a young gentleman of large fortune, who, a Botanist of great accomplishment, was assisted by Dr. SOLANDER from the British Museum, and a retinue of Naturalists and Artists.

Although the observation of the transit was given out to be the purpose of the voyage, yet it was by no means the only one, and in the end proved relatively of little importance. To quote from COOK's instructions "And whereas there is reason to imagine that a continent, or land of great extent, may be found to the southward of the tract lately made by Captain WALLIS in His Majesty's ship *Dolphin* or of the tract of any former navigators in pursuits of the like kind; you are therefore required and directed to put to sea with the bark you command, so soon as the observation of the transit of the planet Venus shall be finished, and observe the following instructions." He was to proceed to the southward in order to discover the continent as far as latitude 40° S., unless it was sooner met with. As great an extent of the coast as possible was to be explored and its peculiarities noted; together with the nature of the soil and all its products, of which, where possible, specimens were to be brought back. The people met with were also to be carefully examined, their friendship and alliance cultivated, and trade opened. Furthermore, COOK was to take possession of convenient situations, or if the land was uninhabited, to annex it in due form. But if neither the continent nor indications of it were encountered, he was to sail westward between the latitude of 35° S. and 40° S. till he fell in with the eastern side of Tasman's New Zealand. This he was to explore as far as circumstances admitted, and return home either round the Cape of Good Hope or the Horn as he judged best.


THE VOYAGES OF
CAPTAIN COOK-
FIRST VOYAGE 1768-1771
SECOND " 1772-1775
THIRD " 1776-1780
GREENLAND
NORTH AMERICA
EUROPE
AFRICA
SOUTH AMERICA
AUSTRALIA
NORTH AMERICA

The real main object was the discovery of a Southern Continent and from this end there was to be no diversion; yet the situation of new discovered islands was to be carefully fixed, and surveys made and possession taken of any which appeared important. Emergencies were left to COOK in consultation with his Officers. On return, all logbooks and journals kept by officers were to be surrendered; nor, until official permission had been granted, were any of the crew to divulge where they had been.

Previous voyages of exploration to the South Pacific had mostly been in an attempt to find "Terra Australis Incognita", the great southern continent which was supposed by many learned men to exist. By this time much of the world had been charted in something approaching its present-day appearance. The outlines of Europe, Asia, Africa and America were approximately known; seamen had sailed most of the oceans of the world, and only the South remained to be discovered. In the absence of known facts the tendency is to reason by analogy. What could exist in that fabled South but another, the last great Continent? Symmetry demanded it; the earth could not possibly balance without it — for in the absence of this tremendous mass of land what, reasoned Mercator, and others after him, was there to prevent the world from toppling over to destruction amidst the stars? It was held by some that "Terra Australis Incognita" stretched from somewhere in the Indian Ocean to South America, and from the East Indies to the South Pole. To some geographers the probability was that this continent adhered to the southern coast of New Guinea, whilst others drew a strait between the two countries.

It would perhaps be as well here to briefly mention previous discoverers of Australia — In 1606, TORRES, a Spaniard, sailed through the strait which now bears his name; whilst between 1618 and 1627 Dutchmen explored the north, south and west coasts. TASMAN in 1642 discovered Tasmania and New Zealand. In 1655 what is now known as Western Australia was named "New Holland" by the Dutch. William DAMPIER, in 1687 and again in 1699 partially explored the west and north-western coasts when in search of gold, Subsequent voyagers added little to the knowledge of the continent, but discovered some of the island groups in the South Pacific. Thus when COOK sailed on his first voyage in H.M.S. *Endeavour*, his chart would have shown only the western, and part of the southern and northern coasts of Australia; part of Tasmania, and just the small angle of New Zealand skirted by TASMAN.

In reading the accounts of COOK's three voyages one is struck by the great difference in literary style between them. COOK's own journals were written with a seaman's straightforward directness and simplicity, for as he mentions in the introduction to the journal of his second voyage — "the public must not expect from me the elegance of a fine writer or the plausibility of a professed bookmaker but will, I hope, consider me as a plain man, zealously exerting himself in the service of his country, and determined to give the best account he is able of his proceedings."

The official narrative of the first voyage, produced by Dr. HAWKESWORTH, is a clumsy compilation from COOK's journals, and is extremely voluminous. It is so decorated with remarks and sentiments, mostly classical, that the reader feels quite bewildered at such writing from a seaman, until the explanation is realized. The editor of the second voyage, Dr. DOUGLAS, Bishop of Salisbury, on the other hand, gives COOK's own words without alteration, and in this account we, as it were, find the man himself and hear his voice. When one reads this narrative it is hard to understand how Dr. HAWKESWORTH can have been allowed to attempt an improvement on COOK's own style. The account of the third voyage, from which COOK never returned, was also edited by Dr. DOUGLAS, but in the first part written by COOK the Bishop has incorporated descriptions and observations from the journal of Mr. ANDERSON, so that the directness and simplicity of COOK's own narrative of the second voyage are missing. The latter part following COOK's death, was written by Captain KING.

Merely to mention a list of places visited and results achieved makes dull reading; but COOK's voyages were so extensive that we are compelled to confine ourselves to the barest summary, and can only touch upon a few of the interesting incidents which occurred.

The Royal Society provided the instruments needed for their observations, but it is surprising to find that although in 1765, John HARRISON had been awarded £10,000 on the successful trial of his chronometer, no chronometer was supplied by the Admiralty to *Endeavour*, and it was the task of COOK and his officers to fix their position by means of lunars — a laborious method and one in which a reasonable degree of accuracy was only possible to an expert.

H.M.S. *Endeavour* sailed from London on the 30th July, 1768, and finally from Plymouth on August 26th. Calls were made at Madeira and Rio de Janeiro, at which

port there was difficulty with the Viceroy, who accused the crew of smuggling and when told of the purpose of the voyage imagined that the transit of Venus was the "North Star passing through the South Pole". COOK stayed on board ship and employed his leisure in drawing a plan of the harbour. On December 7th the voyage was resumed, and on the 14th January, 1769, COOK entered the Strait of Le Maire, anchoring in the Bay of Good Success, on the south-east corner of Tierra del Fuego, on the 15th. Here BANKS, SOLANDER, GREEN and others went on shore for botanical specimens, but were overtaken by a heavy snow-storm, in which two servants were frozen to death and SOLANDER was with difficulty kept from a fatal sleep. Yet next day the vegetation was a delight, celery and scurvy grass were collected in great quantities, and the ship being completed with water and wood sailed to the south-west round Cape Horn.

The first weeks in the Pacific were uneventful, several islands were sighted, and on the 13th April, *Endeavour* anchored in Matavai Bay, Tahiti. An observatory was erected at "Point Venus", and a fort built. The natives, though friendly enough, were "prodigious expert" at thieving. They even stole the astronomical quadrant, and it was only regained, fortunately uninjured, after a long chase into the interior of the island. On June 3rd, the transit of Venus was successfully observed, and COOK then sailed round the island and charted the coast in detail, afterwards spending some months exploring the other islands of the group of which Tahiti is one, giving them the name of the Society Islands.

The task which now lay before him was to find either the great southern continent or the eastern coast of New Zealand. He sailed south until latitude 40°22' was reached, but there was no sign of land, and the heavy southerly swell was all against the chances of falling in with land in anything near his present latitude. He sailed to the westward and on October 7th the North Island of New Zealand was sighted by a boy, Nicholas YOUNG, the point seen being named by COOK, "Young Nick's Head".

From this date until the end of March, 1770, *Endeavour* remained on the coasts of New Zealand, the islands being circumnavigated, surveyed and charted, particular mention being made of Cook Strait, the channel separating the North and South Islands. The native Maoris were found to be generally warlike and unfriendly, in contrast to the Society Islanders, but like them, also addicted to purloining anything they fancied, including on one occasion COOK's sheets, which being washed, were trailing overboard the stern.

A complete running survey was made of the Islands of New Zealand, and in less than six months, 2,400 miles of coast was charted, in spite of adverse and squally weather, which several times blew the ship out of sight of land and split several sails.

His work on these coasts completed and New Zealand now numbered among the possessions of His Britannic Majesty, there lay before COOK the choice of route by which he should return home, which it will be remembered in his instructions was left to his discretion. A council of Officers was held as to the routes by way of the Cape of Good Hope, Cape Horn, direct to the East Indies, or to sail west for further discoveries. It was unanimously decided to take the latter course, little knowing of the perils from the Great Barrier Reef which lay in store for them.

On March 31st, 1770, COOK sailed from Cape Farewell and steered to the westward, and on April 19th the East Coast of New Holland (Australia) was sighted, but it was not until the 28th that a suitable anchorage could be found in Botany Bay (near Sydney), the name being given by COOK, on account of the great variety of strange plants found there by the scientists.

The natives were found to be of an even lower type than the Maoris, and appeared quite unconcerned at the advent of the discoverers. COOK, in his journals, always gave long accounts of all natives met with, describing their manners and customs, all illustrated by excellent drawings, but in these notes it is hardly possible to mention the inhabitants which were encountered.

Sailing on the northward up the coast COOK explored and examined it for upwards of two thousand miles, naming many bays, headlands and islands. On a virgin coast, in waters utterly unknown, the little *Endeavour* found herself entangled among the islands, shoals and sharp coral fangs of the Great Barrier Reef. For days at a time Officers were stationed at the masthead conning the ship, gazing anxiously ahead for swirls in the water, or the greenish tinge betokening shallow patches.

Notwithstanding all precautions, however, *Endeavour* struck a coral reef on June 10th. Unfortunately it was high water, and she remained immovable. COOK writes: "It was an alarming and terrible circumstance and threatened immediate destruction." Even if

the ship were got off with a large leak, she might sink at once, the boats would not take all hands, and the land six or seven leagues away held nothing of promise.

Everyone worked desperately, ballast, guns, old stores and everything that could be spared was flung overboard, yards and topmasts were struck, and at the second high water after going aground the ship was hove off into deep water by her bower anchors carried out astern. Now the pumps could not gain on the leak and the ship's company was exhausted. "Fothering" was decided upon, that is to lower over the bows a sail, on which oakum and wool was sewn, covered with "the dung of our sheep and other filth", and haul it along the bottom of the ship, so that this mixture would be sucked into the leak and close it. The operation was so successful that *Endeavour* was soon pumped dry and stood in for the land, where a small river was found, "Endeavour River", and here she was beached and such repairs as were possible were made.

The stay ashore greatly improved the health of the men, and on August 6th, COOK sailed north again along the coast. It is impossible here to mention the many thrilling adventures which *Endeavour* passed through at this stage of her voyage, she was many more times in danger on the Great Barrier Reef, but the Captain's sure judgment and sound seamanship carried her through in safety.

COOK was now approaching the latitude of the Southern Coast of New Guinea, and was searching for a possible strait between that island and New Holland. On August 21st the land began to look very narrow, and at noon the opening of a passage to the westward into the Indian Ocean was seen.

COOK and a party landed upon a small island at the south-east end of the passage, and "As I was now about to quit the eastern coast of New Holland, which I had coasted from latitude 38° to this place, and which I am confident no European had ever seen before, I once more hoisted English colours, and though I had already taken possession of several particular parts, I now took possession of the whole eastern coast from latitude 38° to this place, latitude 10 ½° S., in right of his Majesty King George the Third, by the name of New South Wales." (So named after a supposed resemblance to the coast of Glamorganshire). COOK named the island "Possession Island", and the passage "Endeavour Strait", which is actually an opening south of Torres Strait. He sailed through, and on August 29th, 1770, New Guinea was sighted, thus proving beyond all doubt that New Holland and New Guinea were separated.

Calls were made at the islands of Timor and Savu, and on October 10th they arrived at Batavia, where the Dutch helped with their badly-needed refit. COOK writes: "What anxieties we had escaped in our ignorance that a large portion of the keel had been diminished to the thickness of the under leather of a shoe!".

On December 20th, *Endeavour* sailed on her long passage home. Dysentery contracted at Batavia was prevalent and scurvy appeared for the first time during the voyage. Thirty men died on the passage across the Indian Ocean, making a total of thirty-seven for the entire voyage. On March 6th, 1771, the land near Cape Natal was sighted, and on the 15th they arrived at the Cape of Good Hope. After refitting and recuperating his invalids, COOK sailed for England. On June 10th the Lizard was sighted — again by the boy Nicholas YOUNG — and two days later the gallant *Endeavour* passed the white cliffs of Dover and came to anchor in the Downs.

For the first few months after his arrival home COOK was hard at work turning over to the Admiralty his vast collection of journals, notes, sailing directions, charts and observations, compiled during the voyage. He had given to his country Australia and New Zealand — nothing less — but the supreme importance of these discoveries and possessions was never properly appreciated during his lifetime. He was rewarded for this eminent service by promotion to the rank of Commander. Meanwhile the controversy about the great southern continent had broken out afresh, as COOK's recent discoveries had not disproved its existence. COOK had not found it because he had not searched for it, so said those, and they were many, who believed in "Terra Australis Incognita", that "El dorado", which might contain riches greater even than those of the Spanish American Colonies. What a prize for the nation who should find it!

It was largely due to the Earl OF SANDWICH, First Lord of the Admiralty, that it was decided to despatch an expedition to settle the controversy, and incidentally to discover and annex any other lands or islands for the British Crown.

COOK was nominated to command the expedition, and as the hazards of the Great Barrier Reef had convinced him of the desirability of a consort, it was decided to send two ships, again Whitby-built merchant vessels: *Resolution* of 462 tons and *Adventure* of 336 tons. Commander Tobias FURNEAUX was appointed to *Adventure* and many of COOK's old officers and men volunteered for the new expedition, 193 men in all. Pro-

fiting bv the experience of the former vovage, COOK took every possible form of anti-scorbutics. This seems to be the first occasion in the history of nautical discovery in which careful preparations were made for combating scurvy, which dreadful disease regularly carried off a considerable proportion of the crews embarked for long voyages.

COOK's orders were long and complicated — briefly, he was to sail South in search of BOUVET's "Cape Circumcision", supposed to be some 1,200 miles south of the Cape of Good Hope. If found he was to survey it and explore it, if not found he was to stand to the southward as far as practicable then steer east and circumnavigate the World, keeping as far south as he could. He was given permission to proceed northward at any time to refit and revictual his ships and recuperate his men. If *Resolution* was lost the voyage was to be continued in *Adventure*.

Before COOK sailed on his second voyage he found time to write a paper for the Royal Society, entitled "An account of the Flowing of the Tides in the South Sea, as observed on board His Majesty's Bark, the *Endeavour*." This paper, as well as one on the Scientific Results of the voyage was published in their Philosophical Transactions.

It is of interest to mention the equipment of navigational instruments supplied for COOK's second expedition:–

An astronomical Quadrant, Two HADLEY's sextants, Four chronometers, An azimuth compass, A pair of globes, A theodolite with a level and chain, A wind gauge, A dipping needle, A marine barometer, Two portable barometers, Six thermometers.

An apparatus for testing the temperature of the sea water at different depths.

WALES and BAYLEY, two astronomers, were appointed by the board of Longitude, one to each ship, and of WALES in *Resolution* COOK mentions with great appreciation.

The ships finally sailed from Plymouth on July 13th, 1772, bound for the Cape of Good Hope, which was reached *via* Madeira on October 30th, and on November 22nd, they sailed in search of Cape Circumcision. Soon the weather became bitterly cold, and "Fearnought" jackets and trousers were served out. On December 10th, the first ice was sighted, and for six weeks they sailed among icebergs and pack-ice, with fog, rain, sleet and snow. By New Year's Day, 1773, the ships were in 60° S., and on January 16th the Antractic Circle was crossed. Still no signs of land, and they were hemmed in by ice. COOK was anxious in regard to fresh water, but ice melted was found to supply the need. A position far to the southward of the reported Cape Circumcision had been reached, the weather was bad and the ice to the southward impassable, so COOK was forced to return to the northward. On February 8th, *Adventure* was lost sight of in thick weather, and the ships did not meet again until May 18th, in Queen Charlotte's Sound, New Zealand, the agreed rendezvous.

Resolution steered first northerly then south-easterly, then east along the parallel of 60° South. No land was sighted and the course was altered for New Zealand, which was reached on March 26th, after 117 days at sea out of sight of land, during which 2,600 leagues had been covered. The health of the men in *Resolution* remained good, only one man being sick.

On June 7th, the ships sailed in company for Tahiti, where in coming to an anchor in a light wind with a strong tide, *Resolution* struck a reef, though luckily without serious damage. Sailing again on September 1st, a cruise was made among the other islands of the group, in all of which COOK met many old friends among the natives, and was able to obtain fresh supplies in plenty. At Huahine, *Adventure* ran ashore but got off without great damage; she seems to have been an unlucky consort as on the passage down to New Zealand she again lost company and was seen no more during the voyage. She reached England finally long before *Resolution*.

COOK again arrived at New Zealand on November 3rd, and refitted *Resolution* at Queen Charlotte's Sound, a good supply of wild celery, scurvy grass and vegetables from seeds planted during their previous visit was obtained. Leaving orders behind in a bottle in case *Adventure* came in, COOK sailed again on November 25th for his second voyage into the Antarctic. When clear of the land he steered to the south-eastward and worked up and down across the South Pacific. He penetrated to 67°31' S., and working through the bergs and heavy floes he reached, on January 30th, 1774, a position in Lat. 71°10' S. Long. 106°54' W., a record that was not beaten until 60 years later.

Further progress south was impossible, as the Great Ice Barrier barred the way, and satisfied that there was no land in this Ocean within the Antarctic Circle, except possibly so far south as to be practically inaccessible, COOK turned north once more, as his men were suffering from fever brought on by the cold and wet.

There was still plenty of unexplored space in the great Pacific, so COOK turned away to the northward, then from February 6th to 12th, 1774, very heavy weather was

experienced, which carried away several sails. Soon afterwards COOK himself was severely ill from what he describes as "a bilious colic". The loathsome salt meat, and biscuit little better than mouldy dust, together with the cold and exposure must have told upon even his iron constitution. A dog was killed and made into soup, and writes COOK "I received nourishment and strength from food which would have made most people in Europe sick". To the great joy of everybody on board the Captain soon recovered, whether or not from the effect of this fresh meat cannot be said!

COOK searched for Juan Fernandes in its reported position but without success, he reached Easter Island on March 12th, then proceeded to examine the Marquesas and Friendly Islands, in each case determining their positions and describing them in detail. After a stay at Tahiti to refit and rest his crews, he cruised among the Society and Friendly Islands, a month being spent surveying the New Hebrides, as COOK renamed the "Grandes Cyclades" of Bougainville. Next followed the entirely new discoveries of New Caledonia, Norfolk Island and the Isle of Pines. After surveying all these a return was made on October 18th 1774 to Queen Charlotte's Sound, New Zealand.

Then followed yet another examination of the far Southern Pacific, which was crossed from West to East through the whole of its extent from South Australia to Tierra del Fuego. Cape Horn was passed on December 29th, and on New Year's Day, 1775, they visited Staten Island. Proceeding again on January 3rd, still in search of the southern continent, the island of South Georgia was discovered, named and formally taken possession of, though COOK was of the opinion that such a place, with hills covered with snow even in the Antarctic Summer, would not benefit anyone. He was mistaken, for South Georgia is now the centre of an extensive and profitable whale fishery.

On January 30th, a group of islands was discovered and named Sandwich Land, after Lord SANDWICH, the First Lord of the Admiralty. After another attempt to find Cape Circumcision on the other side of the Atlantic, course was altered to the northward on February 23rd, for the Cape of Good Hope, and on March 22nd, *Resolution* anchored in Table Bay. From the Cape a return was made to England, by way of St. Helena, Ascension and the Azores, and COOK arrived at Spithead on July 30th, 1775. He had lost no more than four men during the entire voyage, three by accident and only one by disease, a remarkable contrast to any previous long voyage of discovery.

This second expedition of COOK's must always be considered as one of the greatest feats of navigation ever performed. During a period of three years and sixteen days he had circumnavigated the globe near the Antarctic Circle. He had crossed the Southern Ocean in all directions, had skirted the edge of the Antarctic ice until he could force his way no further south. The question of any inhabitable continent in the extreme South was settled for ever. It did not exist.

COOK sums up "It doth not become me to say how far the principal objects of our voyage have been obtained. Though it hath not abounded with remarkable events, nor been diversified by sudden transitions of fortune, though my relation of it has been more employed in tracing our course by sea than in recording our observations on shore, this, perhaps, is a circumstance from which the curious reader may infer that the purposes for which we were sent into the Southern Hemisphere were diligently and effectually pursued. Had we found out a continent there we might have been better enabled to gratify curiosity; but we hope our not having found it, after all our persevering researches, will leave less room for future speculations about unknown worlds remaining to be explored".

COOK was now forty-eight years of age, and he had certainly achieved more than any living person; had probably added more to geographical knowledge than any man since COLOMBUS. He had established and confirmed the outlines of the Southern portions of the globe substantially as they are known to-day. He was now at home again for the last time, and being graciously received by the King, was promoted to Post-Captain and appointed by the Admiralty to be one of the Captains of Greenwich Hospital, which provided him for life with a house and an income of £200 a year and allowances.

He was also elected a Fellow of the Royal Society in February 1776, and awarded the Copley Gold Medal for his paper on the preservation of the health of the crew on long voyages. In addition he contributed a paper on the actions of the tides along the east coast of New Holland.

But in that snug retreat at Greenwich Hospital with his wife and children, COOK could not rest, the habit of incessant work was too deep-seated to be thrown off, and when a further expedition was being planned and he was consulted as to a leader, he replied by offering to go yet a third time. Captain COOK would have been appointed

to the command without the least hesitation, but for a natural feeling that, at his age, he had done enough and should now be left to repose.

He was invited to dine with Lord SANDWICH, together with his old patrons and friends, Sir Hugh PALLISER and Mr. STEPHENS, Secretary of the Admiralty. During dinner the conversation turned upon a projected expedition for the discovery of a North-west Passage, with a view to shortening the route to the Far East, and fired once more by the enthusiasm of the navigator COOK sprang to his feet and offered to take the command, which offer was immediately accepted.

Resolution was again chosen for the voyage, and with her *Discovery*, a smaller vessel, also Whitby built, of about 300 tons, Captain Charles CLERKE in command. As previously, many of those who had served on the previous voyages came forward as volunteers. Plenty of warm clothing was taken, together with articles of "trade", for bartering with the natives, also a present of some cattle from King George to the natives of Tahiti.

By Act of Parliament a reward of £20,000 was now offered to the fortunate ship's company who discovered a North West Passage, and owing to the previous succession of failures to get through from the Atlantic to the Pacific, it was decided for COOK to make an attempt in the reverse direction. He was to proceed to the Cape of Good Hope, then search for some islands south of Mauritius, previously seen by the Frenchmen, MARION DUFRESNE and CROZET. Thence he was to proceed to New Zealand and afterwards to Tahiti. From there he was to sail up the Pacific to the coast of Drake's "New Albion" (British Columbia), and sailing northward was to explore any inlets that seemed likely to lead to communication with the Atlantic.

Resolution sailed from Plymouth on July 12th, 1776, and arrived at the Cape on October 18th, being joined the following month by *Discovery*, which had been delayed in starting. On November 30th, the ships sailed away to the eastward carrying much livestock for Tahiti.

Islands were sighted which COOK named Prince Edward's and Marion Islands and he gave the name of Crozet Islands to another group farther east. Kerguelen was reached on Christmas Eve and good anchorage found in "Christmas Harbour", and the island was surveyed. During the run eastward much bad weather and fog was encountered; *Resolution* lost her mizzen-topmast and the cold weather proved fatal to several of the sheep and goats.

On January 26th, 1777 the ships anchored in Adventure Bay, Van Diemen's Land (Tasmania) and necessary repairs were carried out. This was the first time that COOK had been on the coast of Van Diemen's Land and he did not discover that it was an island, but concluded that it was part of New Holland.

New Zealand was next visited, then until the end of the year the ships cruised among the South Pacific Islands, the livestock, horses, cows, sheep, turkeys, geese, ducks and peacocks being landed at Tahiti, much to everyone's relief. How this menagerie was found room for in the confined space on the decks of small crowded ships and how they were kept alive on a passage with much bad weather, it is impossible to imagine.

On December 23rd the ships crossed the Equator sailing northward, and on the 25th discovered "Christmas Island", whence a supply of turtle and fish was obtained. The Sandwich Islands (Hawaii) were next found, being also named after the First Lord of the Admiralty. On March 7th, 1778, the coast of North America near Vancouver Island was sighted, and an almost continuous survey was made of the coast up to Behring Straits (previously discovered and named by Vitus BEHRING the Danish navigator). On this coast COOK discovered and named many capes, islands and inlets. He found to the south-east of the Alaska Peninsula what seemed to promise a passage to the Arctic Seas, and penetrated without success into an inlet now known as Cook's River.

He finally sailed on north of Behring Straits as far as 70°41' N. where no further advance could be made as the ships were barred by an unbroken barrier of ice, rising 12 feet above water and stretching as far as could be seen. COOK named the farthest point visible on the American shore, Icy Cape (extreme north-west of Alaska).

Turning back, COOK cruised for some time on the coasts of Alaska and Siberia. Here he met some Russian traders, to one of them COOK entrusted a letter and chart to be forwarded *via* Siberia to the Admiralty. These were safely delivered in London the following year.

So the search for a North-West Passage had failed, but extensive surveys had been carried out over some 1,200 leagues of coast, and again the whole coast of British Columbia and Alaska became in due course another British possession. This really

belongs to a later story, as it was George VANCOUVER, a midshipman under COOK upon his second and third voyages, who, eleven years later sailed in command of *Discovery* and finally added these lands to our Empire.

On October 26th, 1779, the ships sailed southward and discovered Maui, another island of the Sandwich Group. Here COOK obtained a quantity of Sugar cane which he ordered to be utilised for brewing beer, intending it for use instead of rum with a view to saving the latter for use in colder climates. But the men would have none of it, and as COOK writes "every innovation whatever, tho'ever so much to their advantages, is sure to meet with the highest disapprobation from seamen". It would seem, therefore, that the eighteenth century sailor, not unlike his twentieth century brother, was suspiciously conservative in his likes and dislikes!

Hawaii, the principal island of the Sandwich Group was reached on November 30th, and after some time spent in surveying, the ships anchored in Karakakooa Bay. The natives were very friendly but as usual expert at thieving, in fact it appears that all the natives of the Pacific with whom COOK came in contact had no respect whatever for the property of other persons. The removing of numerous small articles, such as the rudder of a boat and the lids of boilers must have caused great annoyance.

Resolution and *Discovery* left on February 4th, 1779, the King presenting a herd of pigs and quantities of vegetables to COOK. Soon afterwards in a heavy gale *Resolution*'s foremast was so badly sprung that it was necessary to unstep it for immediate repair, and a return was made to Karakakooa Bay on February 11th.

The natives did not welcome the return of the ships, possibly due to some superstitious idea, but the mast was got ashore and repairs proceeded with. On the afternoon of the 13th, the natives commenced to be distinctly hostile, and a watering party was attacked. Many thefts took place and canoes with stolen property on board were chased by ship's boats, the crews of which were stoned and roughly handled.

Next morning *Discovery*'s six-oared cutter was missing, and COOK determined to teach the natives a lesson. He landed with a party of armed marines, proceeded to the village and saw the King. Just at this time news arrived that a Chief had been killed by some of the sailors on the other side of the bay. Matters became immediately serious, the natives donning their warmats and menacing COOK's party, which retreated to their boats. Stones began to fly and the marines were attacked, so that fire was opened by them and the boats' crews. In the struggle which ensued COOK was clubbed from behind, at the very instant when he was ordering his men to cease fire.

Thus, due to petty thieving, terminating in a fight, in the midst of a brilliant career perished James COOK; and at sunset on February 21st, 1779, with the booming of minute guns and the colours at half-mast, his remains were reverently committed to the deep.

It is unnecessary here to describe the remainder of the voyage and the further ineffectual attempts to discover the North-West Passage, before in October, 1779, the ships started homewards by way of Japan, Macao, the Straits of Sunda and the Cape of Good Hope. *Resolution* and *Discovery* under the command of Lieutenants GORE and KING respectively (Captain CLERKE having died on 22nd August, 1780) finally arrived in England on October 4th, 1780, having been absent four years, two months, and twenty-two days.

This account would hardly be complete without some mention of the tragedy of COOK's children. He had six, of whom three boys grew up to manhood, the two elder entering the Navy. In the same week as the news of her husband's death reached the unhappy widow, her second son Nathaniel went down on board H.M.S. *Thunderer* in a hurricane off Jamaica, in October 1780. The youngest son, Hugh, died in December 1793, whilst at Christ's College, Cambridge, and only five weeks later Commander James COOK, her eldest son, who had only just received his promotion and appointment to command the sloop *Spitfire* was drowned, when going off his ship at Portsmouth.

Mrs. COOK lived to be ninety-three years of age, she received a pension, and became a wealthy woman with her share in the profits of her husband's books. She is described as a handsome and venerable lady, who entertained the highest respect for her husband's memory, measuring everything by his standard of honour and morality.

Outside the Mall entrance to the Admiralty stands one of the many statues of Captain James COOK. Distinguished honours have since been heaped upon his memory, but for his great services he received only a very inadequate share of official reward. The greater part of his journals, logs and sailing directions are now in the Australian Commonwealth National Library, but the log of the First Voyage and the gold medal conferred on the Captain by the Royal Society are in the British Museum. A manuscript "Directions for Sailing" in COOK's handwriting, and his hanger and telescope are

preserved in the museum of the Royal United Service Institution in Whitehall, while in the Painted Hall at Greenwich is his portrait in naval uniform painted by Nathaniel DANCE, R.A.

As a Commander, Navigator, Observer, Surveyor and practical Physician his merits were equally great. COOK's record is truly wonderful and compared with his achievements the voyages of other navigators fade into insignificance. Of our famous Seamen he was the greatest Empire Builder of them all.

Together with a commanding personal presence, sagacity, decision and perseverance, he won the affection of all those who served under him.

As Seamen we may well be proud of his undying memory.

TIME DETERMINATION AND TIME BROADCAST

by

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As far back as history, and even legend, carry us, man has tried continuously to devise methods of determining and of keeping time. The earliest attempts were very crude and naturally divided themselves into two general groups: (1) those in which the positions of the stars and the sun were observed with reference to objects near at hand; and (2) those in which efforts were made to measure the elapsed time.

In the first class, whatever their form, all were some type of sundial or some crude form of a transit instrument. The first attempts were satisfied by a range between two widely separated objects that happened to lie in the meridian.

In the second class, the earliest efforts consisted in the burning of rope knotted at regular spaces, or the draining of water or sand from one container to another; or, as was reputed to have been done in early China, the burning of candles. Each effort was an attempt to improve on the best previous method.

All modern methods of time determination are based on the uniform rotation of the earth on its axis. The interval between two successive transits of the same star over the same meridian measures one complete revolution of the earth. That constitutes a sidereal day. It is conveniently divided into 24 hours and each hour is further divided into minutes and seconds.

The earth is our best master clock. It requires neither winding, resetting, oiling, nor repairing to make it keep accurate time. If by some trick of magic we could secure marks in the sky, indicating the hours, minutes and seconds, we could all throw away our watches and clocks. Inasmuch as that is impossible, we naturally turn to the stars which are our nearest approach to hour marks in the heavens. They are so distant that we can mark them with the greatest accuracy in measuring the period of the earth's rotation. As a matter of fact, if you know your stars, you can very closely approximate the hour marks in the heavens. Observing the stars as they apparently swing across the heavens, and noting the exact instant of the meridian passage by some clock, permits us to determine the error of that clock with great exactness.

The continuous effort for years to develop clocks, each expected to maintain time more accurately than all previous ones, parallels the history of man and measures his progress. For years, the most accurate clocks have been made abroad, England, France and Germany vying with each other to produce the most accurate timepiece in the world. And now we come to the latest development — the crystal oscillator — which at one stroke cuts loose from all the troubles inherent in pendulum clocks. True, it has faults of its own, but they will be overcome.

Returning to the stars, if you will memorize the right ascensions of some of the most prominent stars in the principal constellations, you will have established a celestial clock capable of use every clear night.

EARLY EFFORTS IN MECHANICAL BROADCASTING OF THE TIME PRIOR TO RADIO.

Prior to 1830, there was no satisfactory method of fulfilling the Navy's requirements. These requirements included charts, navigational instruments, chronometers, nautical