

H.M.S. CHALLENGER

by

REAR ADMIRAL J. D. NARES, D.S.O., PRESIDENT OF THE DIRECTING COMMITTEE.

On page 187 of the *Hydrographic Review*, Vol. VIII., No 2, November 1931, a description was given of H. M. S. *Challenger* which was built by the British Admiralty for the Ministry of Agriculture and Fisheries but which was actually commissioned as one of H. M. Surveying Ships on 2nd January 1932, and has since been employed on surveying duties off the Labrador Coast. A photograph and plans of the vessel have now been received in the Bureau and are reproduced as a frontispice and on page 20 of the present volume.

It is interesting to compare this latest addition to the British Hydrographic Service with the original *Challenger* which carried out the Scientific Cruise round the World in 1872-1876, a photograph, description and brief history of which vessel, together with a photograph of the officers and scientists, are therefore inserted.

The report of the scientific results during the cruise of the original *Challenger* has already been published in a large series of volumes but it will not be out of place to include here a short account of her voyage, that part of her cruise from Portsmouth to Hong Kong being chiefly compiled from the private journals of her first Commanding Officer, the late Vice-Admiral Sir Geo. S. NARES, K. C. B., F. R. S., which are in the possession of the writer.

The original *Challenger* was a screw corvette of 1462 tons Displacement; Length between perpendiculars 200 ft. 00 inches; Beam, extreme, 40 ft. 4 inches; Depth in hold 23 ft. 11 inches. She had a two-cylinder engine developing 400 Horse Power and was fitted with a two-bladed propeller which could be disconnected and hoisted clear of the water. She was laid down at Woolwich on 3rd October 1855 and launched on 13th February 1858. She was first commissioned at Sheerness by Captain J. J. KENNEDY, C. B., on 6th May 1861 and sailed on 4th June that year for service on the Atlantic Coast of North America and in the West Indies. In January 1862 whilst flying the Broad Pendant of Commodore Hugh DUNLOP she participated in operations against Mexico, including the occupation of Vera Cruz. She was ordered home in November 1864 and paid off at Sheerness on 3rd February the following year. She was again commissioned on 12th April 1866 by Commodore Rochfort MAQUIRE for service on the Australian Station, sailing on the following 30th May. On 28th May 1867 she was flying the Broad Pendant of Commodore Rowley LAMBERT, C. B., and in August 1868 proceeded to the Fiji Islands on a punitive expedition to avenge the murder of a missionary and some of his dependants. She returned to England and paid off on 4th March 1871.

She was then selected for service for carrying out a Scientific Cruise round the World, and having had her spars and armament reduced she was commissioned on 15th November 1872 by Captain George S. NARES, R. N., with a special complement of 174 including the following officers under his command :-

Commander McCLEAR.	Surgeon Crosby.
Lieutenants Pelham ALDRICH, BETHELL and BROMLEY.	Assistant Surgeon MACLEAN. Paymaster RICHARDS.
Navigating Lieutenant TIZARD.	Assistant Paymaster HYNES.
Sub-Lieutenants Lord G. CAMPBELL, BALFOUR, CHANNER and SLOGGETT.	Chief Engineer FERGUSON. Engineers SPRY and ALLEN.
Navigating Sub-Lieutenants HAVERGAL and SWIRE.	Assistant Engineers HOWLETT and ABBOTT.

Sub-Lt. HARSTON relieved Sub-Lt. SLOGGETT at Halifax, and Lt. CARPENTER relieved Lt. Pelham ALDRICH at Hong Kong. Sub-Lts. Lord G. CAMPBELL and BALFOUR left the ship at Valparaiso on promotion.

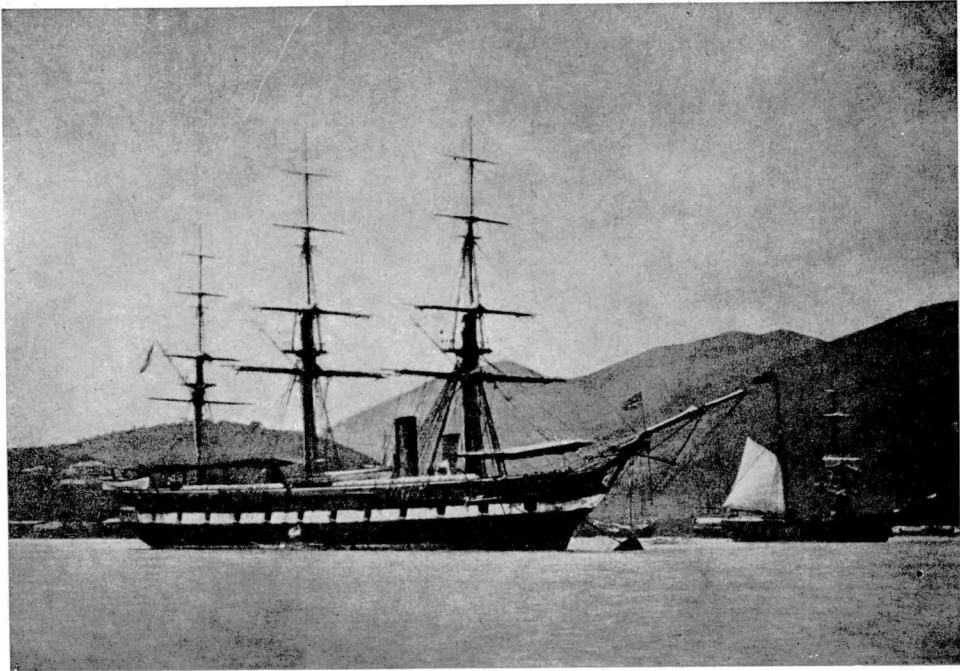
The civilian Scientific Staff under Professor WYVILLE-THOMSON consisted of the following :-

Mr. MURRAY, Naturalist.	D ^r V. Willemos SUHM, Naturalist.
Mr. WILD, Secretary & Artist.	Mr. BUCHANAN, Chemist.
Mr. MOSELEY, Naturalist.	

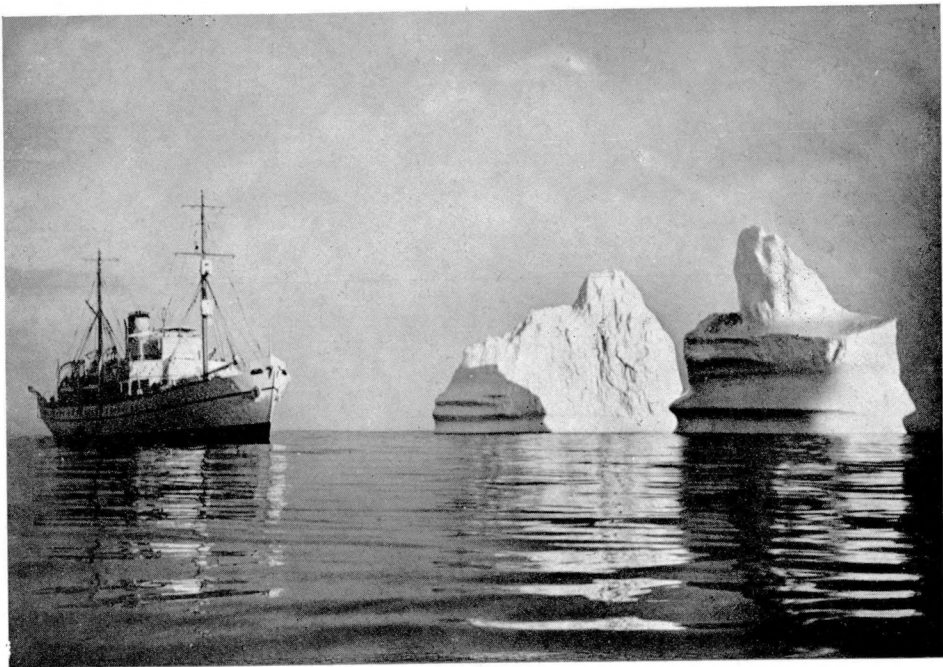
On voyage to Tahiti D^r Willemos SUHM died.

The Expedition sailed from Portsmouth at 11.30 a.m. on Saturday 21st December 1872 and at once met with bad weather which continued until 27th, "the ship rolling heavily and her top-sides and bulkheads working considerably." The first deep sounding of 1125 fathoms was taken at 8 a.m. on Monday 30th December in the neighbourhood of Vigo and the dredge was sent down at 9.30 a.m. that day but came up foul. Lisbon was reached on 3rd January 1873. The King of Portugal graced the *Challenger* with a visit on 8th January "remaining over an hour on board, taking a great interest in the objects of the expedition and displaying more than the usual amount of knowledge in the different subjects in which investigation is to be made." Bad weather delayed the ship at Lisbon until 12th January when she sailed via Gibraltar and Madeira for Teneriffe, leaving this last port on Friday 14th February. St Thomas, Virgin Isles, was reached on 16th March, the voyage from Teneriffe having occupied 30 days during which many deep-sea soundings were taken and dredging carried out. On her voyage across the Atlantic the ship stopped at St Paul's Rocks, "making fast to the lee side of them with an 8 inch hawser veered to 50 fathoms, remaining quietly secured in the same place for two nights. The ship was secured under the lee of the N. W. Islet, the hawser being secured to a strop of worn rope passed round the rock tops."

The following list shows the ports visited during the cruise and the vessel's track is shown on the attached chart.



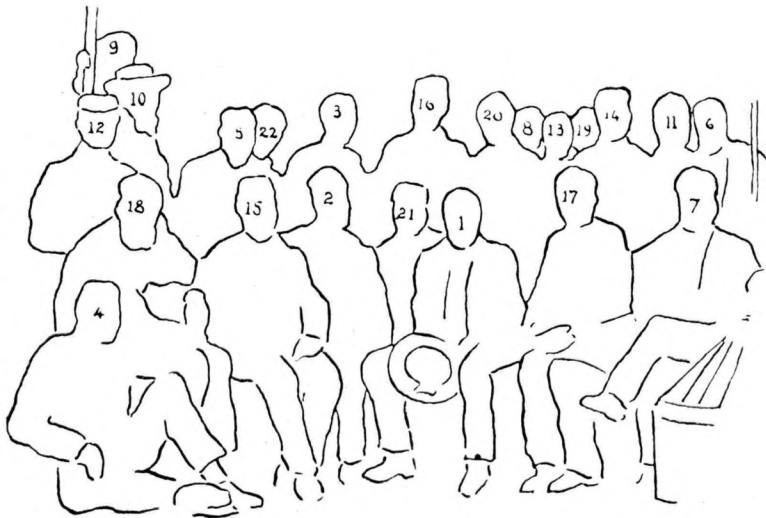
H. M. S. Challenger,
ST THOMAS, WEST INDIES, 1873



H. M. S. Challenger,
LABRADOR, 1932

GROUP OF CAPTAIN OFFICERS
AND SCIENTISTS,
H. M. S. *Challenger*, 1873

LE COMMANDANT, LES OFFICIERS
ET LE PERSONNEL SCIENTIFIQUE
DU *Challenger* EN 1873



- 1 Captain Nares.
- 2 Prof. Wyville Thomson.
- 3 Mr. Wild.
- 4 Commander Mc Lear.
- 5 Lieutenant Aldrich.
- 6 Lieutenant Bromley.
- 7 Lieutenant Bethell.

- 8 Mr. Moseley.
- 9 Mr. v Willemoes Suhm.
- 10 Mr. Buchanan.
- 11 Mr. Murray.
- 12 Sub-Lieutenant Balfour.
- 13 Sub-Lieutenant Channer.
- 14 Sub-Lieutenant Harston.
- 15 Nav^g. Sub-Lieutenant Havergal.

- 16 Nav^g. Sub-Lieutenant Swire.
- 17 Surgeon Crosby.
- 18 Assist. Surgeon Mc Lean
- 19 Paymaster Richards.
- 20 Assist. Paymaster Hynes.
- 21 Assist. Engineer Spry.
- 22 Assist. Engineer Howlett.

PLACE-LIEU	Arrived Arrivée	Left Départ	PLACE-LIEU	Arrived Arrivée	Left Départ	PLACE-LIEU	Arrived Arrivée	Left Départ
Portsmouth, England	—	21. 12. 72	Sydney, Aust.	6. 4. 74	12. 6. 74	Yokohama	5. 6. 75	16. 6. 75
Lisbon	3. 1. 73	12. 1. 73	Wellington, N. Z.	28. 6. 74	7. 7. 74	Honolulu, Hawaii Is.	27. 7. 75	11. 8. 75
Gibraltar	18. 1. 73	26. 1. 73	Tonga Is.	19. 7. 74	22. 7. 74	Hilo, Hawaii Is.	14. 8. 75	19. 8. 75
Madeira	3. 2. 73	5. 2. 73	Fiji Is.	24. 7. 74	10. 8. 74	Tahiti	18. 9. 75	3. 10. 75
Teneriffe, Canaries	7. 2. 73	14. 2. 73	Api Id., New Hebrides	17. 8. 74	17. 8. 74	Juan Fernandez	13. 11. 75	15. 11. 75
St. Thomas, W. Indies	16. 3. 73	24. 3. 73	Raine Id.	31. 8. 74	31. 8. 74	Valparaiso	19. 11. 75	11. 12. 75
Bermuda	4. 4. 73	21. 4. 73	Albany, C. York, Aust.	1. 9. 74	8. 9. 74	Port Otway, G. of Penas	31. 12. 75	1. 1. 76
Halifax, N. S.	9. 5. 73	19. 5. 73	Booby Id., Aust.	9. 9. 74	9. 9. 74	Hale Cove	1. 1. 76	2. 1. 76
Bermuda	31. 5. 73	12. 6. 73	Dobbo, Arn Is.	16. 9. 74	23. 9. 74	Gray Hr.	2. 1. 76	4. 1. 76
Fayal, Azores	2. 7. 73	2. 7. 73	Wanu Mbai	24. 9. 74	26. 9. 74	P. Grappler	4. 1. 76	5. 1. 76
St. Michael	4. 7. 73	9. 7. 73	Kai Is.	29. 9. 74	2. 10. 74	Tom Bay	5. 1. 76	8. 1. 76
Madeira	16. 7. 73	17. 7. 73	Banda	4. 10. 74	10. 10. 74	Puerto Bueno	8. 1. 76	10. 1. 76
St. Vincent, C. Verde Is.	27. 7. 73	5. 8. 73	Amboina	14. 10. 74	17. 10. 74	Isthmus Bay	10. 1. 76	11. 1. 76
Porto Prango	7. 8. 73	9. 8. 73	Ternate	23. 10. 74	26. 10. 74	P. Chunuca	11. 1. 76	13. 1. 76
St. Paul's Rocks	27. 8. 73	29. 8. 73	Zamboangan	28. 10. 74	31. 10. 74	P. Famine	13. 1. 76	14. 1. 76
Fernando Noronha	1. 9. 73	3. 9. 73	Ilo Ilo	4. 11. 74	11. 11. 74	Sandy Point	14. 1. 76	18. 1. 76
Bahia, Brazil	14. 9. 73	25. 9. 73	Manila	16. 11. 74	6. 1. 75	Elisabeth Id.	18. 1. 76	20. 1. 76
Tristan da Cunha	15. 10. 73	17. 10. 73	Hong Kong	11. 1. 75	14. 1. 75	P. Stanley, Falkland Is.	23. 1. 76	6. 2. 76
Capetown	28. 10. 73	17. 11. 73	Manila	18. 1. 75	24. 1. 75	Monte Video	15. 2. 76	25. 2. 76
Marion Is.	26. 12. 73	27. 12. 73	Zebu	26. 1. 75	26. 1. 75	Ascension	27. 3. 76	3. 4. 76
Crozet Is.	1. 1. 74	3. 1. 74	Camiguin	29. 1. 75	5. 2. 75	Porto Praya (C. Verde Is.)	16. 4. 76	17. 4. 76
Kerguelen Is.	7. 1. 74	1. 2. 74	Zamboangan	23. 2. 75	2. 2. 75	St. Vincent	18. 4. 76	26. 4. 76
Heard Is.	6. 2. 74	7. 2. 74	Humboldt, B. New Guinea	29. 2. 75	10. 3. 75	Vigo	20. 5. 76	21. 5. 76
Antarctic Circle	16. 2. 74	—	Admiralty Is., New Guinea	3. 3. 75	11. 5. 75	Spithead	24. 5. 76	25. 5. 76
Melbourne, Aust.	17. 3. 74	1. 4. 74	Yokohama	11. 4. 75	11. 5. 75	Sheerness	26. 5. 76	—
			Kobe & Inland Sea	15. 5. 75	2. 6. 75			

Paid off at Chatham 6th June, 1876.

Désarmé à Chatham, le 6 Juin 1876.

On arrival at Hong Kong Captain NARES and Lt. Pelham ALDRICH returned to England to take part in the British Arctic Expedition in the *Alert* and *Discovery*, Captain Frank T. THOMSON taking over command of the *Challenger* for the remainder of her voyage, Lt. CARPENTER relieving Lt. Pelham ALDRICH.

The *Challenger* arrived back at Portsmouth on 24th May 1876 and was paid off at Chatham the following month. On 13th July 1876 she was commissioned as Coast Guard and Drill Ship of Naval Reserves at Harwich, flying the flag of Rear Admiral Aug. PHILLMORE, and was finally paid off and placed in reserve at Chatham on 22nd April 1878. In 1883 the *Challenger* was converted into a Receiving Hulk and remained at Chatham until she was finally sold for breaking up on 6th January 1921.

The following description of the method of obtaining deep sea soundings during the voyage is taken from the *Report of the Scientific Results of the exploring voyage of H. M. S. Challenger, 1873-1876*, and will be of interest as a comparison with modern methods. The soundings rods and weights used are similar to those at present in use in the British Surveying Service, so a description of them is unnecessary.

METHOD OF SOUNDING. — When a sounding was required steam was got up and all sail shortened and furled except the spanker. This proceeding was indispensable, as no trustworthy soundings could be obtained from the ship under sail, even in the calmest weather, the heave of the sea, or the surface current, being sufficient to drift her in a very short time a considerable distance from the place where the lead was originally let go and thus prevent the line from running out perpendicularly.

Sail being shortened and steam up, the ship was brought head to wind and the sounding gear got ready as shown on attached Figure 1.

A block *A* was secured to the foreyard a little outside the boom iron and a whip rove through it to trice up the set of accumulators *B*. At the bottom of the accumulator a 9-inch gin block *C* was hooked with the sounding line rove through it and secured to the sounding rod and sinkers *D*. To the line immediately above the sounding apparatus was attached a water bottle *E* and above the water bottle two and sometimes three thermometers and a pressure gauge *F*. Owing to the constant motion of the ship the sounding rod and sinkers were lowered into the water directly they were lifted over the side to prevent their swaying backwards and forwards with the risk of doing considerable damage, and the water bottle and other instruments were attached after the sinkers were in the water. Before the sounding line was bent on to the rod it was rove through a thimble at the end of a lizard so that the bight of the line could at any time be hauled in close to the ship.

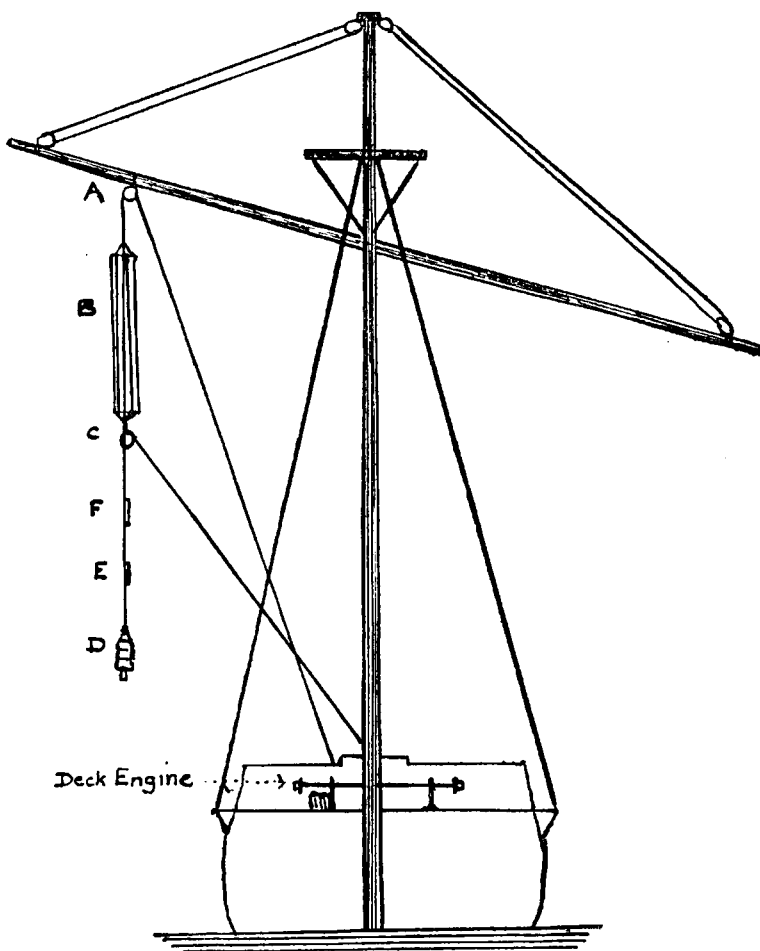


FIG. 1

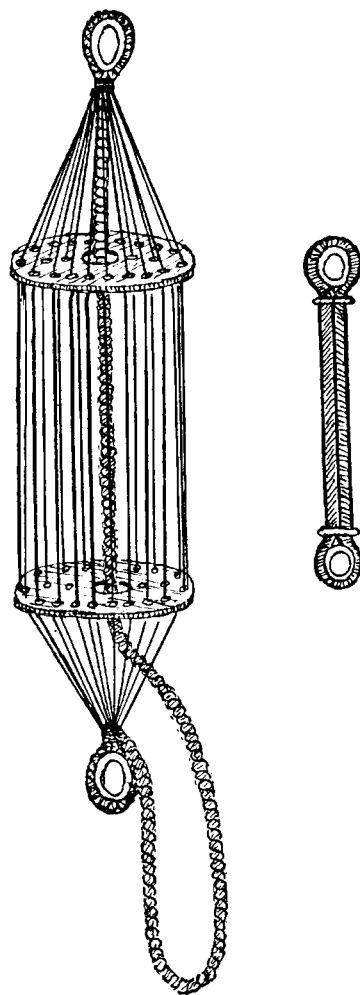


FIG. 2

When all the instruments had been attached to the line it was eased down 400 or 500 fathoms by being passed round the drum of the donkey-engine which was fitted with a brake for the purpose. When the amount of line had been eased out it was allowed to descend freely, the ship being kept exactly over the spot where the sinkers entered the water. As the line ran out the exact time each 100 fathom mark entered the water was registered in a book provided for the purpose and the interval between these times was calculated and also entered. These intervals gradually increased in length, the sinkers being retarded in their descent by the friction of the line as it passed through the water; they were found to increase in regular proportion as long as the sinkers were descending, but directly they reached the bottom there was a sudden lengthening of these intervals and it was known that the sinkers were at the bottom and the heaving in of the line was commenced by bringing it to the drum of the donkey-engine. Care was taken not to heave up too quickly at first and also to keep the ship carefully in position over the line, for, if allowed to fall off, the wind drifting her to leeward brought an unnecessary strain on the line.

It is interesting to note that the interval of time between the 1000 and 3000 fathoms marks entering the water averaged, using a 3 cwt. sinker, 0 h. 40 m. 20 secs. and using a 4 cwt. sinker 0 h. 35 m. 41 secs.

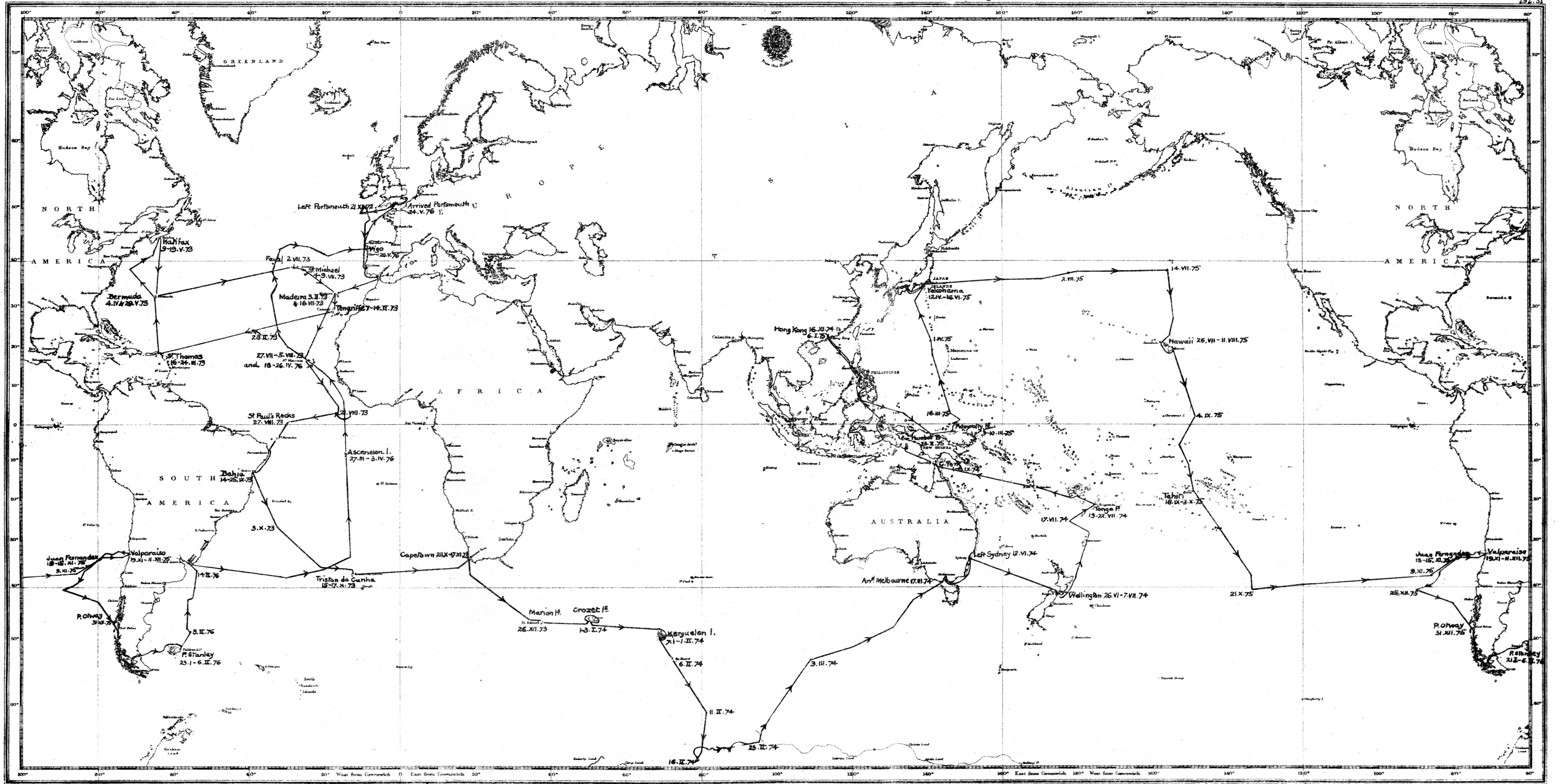
SOUNDING LINES. — Two kinds of sounding lines were supplied, the first being 1 inch in circumference with a breaking strain of 14 cwt., and the second being $\frac{3}{4}$ inch in circumference with a breaking strain of 10 cwt. These lines were made of best Italian hemp, well hackled and rubbed down to prevent any rugged parts projecting outside and increasing the friction through the water; they were made in lengths of about 120 fathoms, a number of which were spliced together so as to form a connected line of 3000 fathoms. The whole length of 3000 fathoms was kept on one reel, so that it might run out uninterruptedly, the first 25 fathoms being doubled as they had to bear the strain of lifting the sinkers over the side.

Owing to some defect in its construction the $\frac{3}{4}$ inch line was found unequal to the strain it was intended to bear so that it parted in "heaving in", and therefore after a few trials it was entirely discarded for deep sea soundings and only the one-inch line was used.

THE ACCUMULATORS (Fig.2) were india rubber bands $\frac{3}{4}$ inch in diameter and 3 feet in length. They were used to prevent any sudden jerks arising from the pitching or rolling of the ship bringing an undue strain on the sounding line. They were constructed in the form of a ring with a wooden thimble in each bight, securing it there with a small india rubber band. Groups of twenty accumulators were found sufficiently strong to withstand the strain of the sinkers on the sounding line and in order to combine them so that they should exert a force proportionate to their numbers they were attached to two discs of wood by laniards spliced into the thimbles at each end which passed through holes in the upper and lower discs and then collected together and formed into an eye at the top and bottom so that a rope could be bent on, or a block hooked on to these eyes. To prevent the accumulators being by any accident stretched to such a length as would render them liable to break, a short piece of 4 inch rope was rove through a large hole in the centre of each disc and spliced into the eyes formed at each end by the accumulator laniards, and the length of this rope was regulated so as to allow the accumulator to stretch 15 feet, after which any additional strain, which would otherwise have been borne by them, was borne by this preventer rope.



THE WORLD
 showing track of H.M.S. "CHALLENGER", 21st December 1872 to 24th May 1876.



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