

WORK DONE DURING THE THIRD COMMISSION OF THE R.R.S. "DISCOVERY II"⁽¹⁾

by

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The Royal Research Ship *Discovery II* arrived at St Katherine's Dock, London, on July 4, 1935, thus completing her third commission, like the others of twenty months' duration so as to cover two Antarctic summer seasons.

She left the Thames on October 21, 1933, and five weeks later was on the whaling grounds at South Georgia, having made a slight detour to the east to call at Tristan da Cunha.

A few days only were spent at South Georgia, which was reached on November 28. A line of stations was then made across the Scotia Sea to the South Shetlands, and from there due north in Long. 78° W. to the western opening of the Straits of Magellan. This was part of a considered programme begun on a previous commission in order to make repeated studies in full of the nature of the sea water and of its plant and animal life across the western end of Drake Passage, a sector of the Atlantic where the conditions are not complicated by the presence of submarine banks and island groups. The primary object of the observations is to follow the great seasonal changes in the water movements and so trace the circulation of the marine animals and plants on which the whales and all other Antarctic life are ultimately dependent.

A return was then made to Port Stanley in the Falklands, and stores and fuel were taken on board for crossing the Pacific.

Port Stanley was left on December 27, 1933, and the passage across to Auckland took five weeks. It was carried out in the following way: the ship would first run down diagonally to the ice-edge, make observations, and then steam north-west for a day and a half, turn sharp left, and so back to the ice-edge. It was so arranged that two stations were always made at the edge, one in the late evening on arrival and one on the morning following: should the ice-pack be unexpectedly far north the ship would skirt westwards along it till the normal observation time. By this method the stations were properly spaced and also a fragmentary but sufficient knowledge was obtained of the general run of the ice-edge. In this way the ship zigzagged to 150° W., whence a direct line was taken to New Zealand.

Thirty full stations were made during the cruise, and in addition there were 19 subsidiary "towing" stations. This was a remarkable achievement only made possible by the mutual understanding and efficiency of both scientists and crew. A full station takes from three to four hours; it includes a sounding and the noting of meteorological data; of chief importance are the observations of sea temperature taken at at least twenty points between the surface and the bottom — here from two and a half to three miles deep — and the collection of water samples for chemical analysis from these same points. Concurrently a series of hauls are made, both vertically and horizontally, with nets of varying mesh to collect the microscopic vegetation which constitutes the "pastures" of the ocean. A towing station is confined to using certain of the nets to keep a check on the intervals between stations.

The return voyage from New Zealand was begun somewhat earlier than had been planned as it was urgently necessary to go down to the Ross Sea to help Rear-Admiral BYRD. BYRD's appeal was taken up by *Discovery II* at Auckland on February 9; she left on February 11; on February 14 she was at Dunedin, and making all speed left next day at noon for the South. It was a race against the winter freeze-up in the

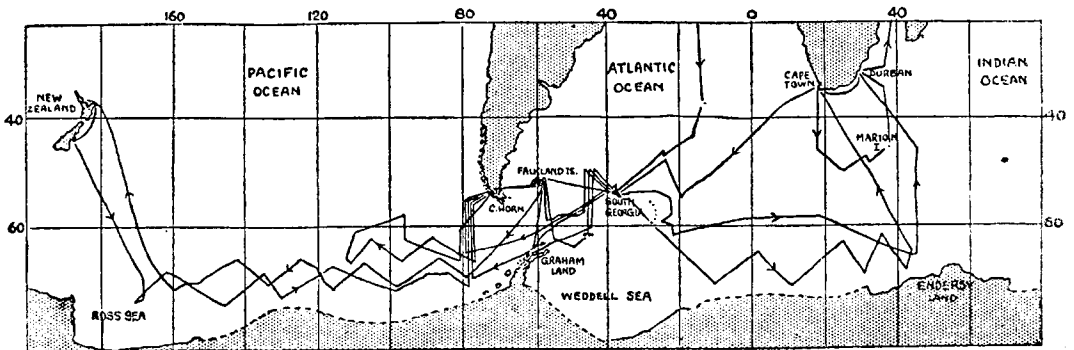
(1) See *The Hydrographic Review*, Vol. XI, No. 2, November 1934, p. 77.

Ross Sea. BYRD's ship, the *Bear of Oakland*, was steaming north and on February 22 they met, and made the transfer of personnel and stores of which BYRD was so much in need. The two ships were about twelve hours in company; less than an hour after they parted, *Discovery II's* staff were at work on their first station.

The routine on the return was of the same nature as on the outward voyage — a series of zigzags to and from the ice-edge, so shaped that the north point of each tack should be approximately in the same longitude as the south points of the outward tacks. The season, however, was now late, and a passage in these high southern latitudes was not without risk. At times the ship ran into newly forming ice in the different stages of its growth from scum like soapsuds or smallish disks to the larger "pancake" several feet in diameter. Peter I Island was passed on March 8; and finally the south to north series of stations in about the meridian of 80° W. was repeated, and passing through Magellan Straits *Discovery II* finally reached Port Stanley on March 22, 1934.

A few days only were spent at Stanley. The Falklands were left on March 27, and on March 30 the ship passed east of Clarence Island and Elephant Island, where SHACKLETON's men had wintered in 1916. Thence she made the South Orkneys, and from there took a line of observations northwards along the 44th meridian, reaching South Georgia on April 10. This short cruise provided information on the eastern portion of Drake Passage for comparison with the west, and is part of a series of observations, now nearly complete, which covers the whole of the Scotia Sea, and as much as possible of the Weddell Sea.

The *Discovery II* sailed from South Georgia on April 20, and took a curving route down the east side of the Sandwich Group, across the 4000 fm. Sandwich Deep, and so to a point about 100 miles from Enderby Land. Her farthest at this point was in $64^{\circ}37'$ S., $44^{\circ}16'$ E., on May 8 among forming ice. She turned north that night and ran a further line of 15 stations to the Cape, and berthed finally at Simonstown on May 27.



Discovery II sailed from Capetown on August 1, 1934, carried a chain of stations to South Georgia, and as in the previous season made lines in the Scotia Sea, and finally again in 80° W. This bad weather period ended with her arrival at Magallanes in the middle of October.

The Pacific was again in the forefront of the programme, but work was now confined to the eastern half. Zigzags were run westward between 70° W. and 110° W., and a return then made between these same limits of longitude, but at more northern latitudes. The result of this manœuvre has been to provide the East Pacific sector with a network of traverses made in four separate months, and these show the differences in animal and plant concentration and temperature variations with respect not only to latitude, but also to the time of year.

The *Discovery II* was back at Port Stanley on November 24. She was now under orders to assist the British Graham Land Expedition whenever possible, consistent with her own scheme of work in the Falkland Island Dependencies. Mr. RYMILL's ship, the *Penola*, arrived at Sydney on November 28.

The *Discovery II* sailed on December 2 carrying surplus stores for Mr. RYMILL and also his whole complement of sixty dogs. These were landed at Deception Island six days later, the *Discovery II* being now due for survey work on the Atlantic coasts.

A feature of the Discovery Committee's endeavours has been the charting of the various dependencies of the Falkland Islands. The most complete work has been that of Lieutenant-Commander CHAPLIN in South Georgia where the concentration of commercial ships is greatest, and where the coast, the harbours and the approaches have now been sufficiently surveyed for all practical purposes. In addition, running surveys have been made of the South Sandwich Group on the first commission, and of the South Orkneys during the second. The resulting charts are all the work of Lieutenant NELSON, who continues to be surveyor as well as captain of the ship. Similar mapping in the South Shetlands has been much more difficult. Each year, however, has seen another small portion put on the map. This season the whole period from December 8, 1934, till January 9, 1935, was devoted to this region, and it appears that the South Shetland running survey is now nearly complete. It must have been extremely difficult work, for the coast is foul throughout, and shocks to the navigator's nerves must have been frequent. Part was done by motor-boat, but at other times the ship herself would approach the land with all hands on the alert — the captain and the watch-keeper on the bridge, an officer and anchoring party forward, and aloft the look-out. On occasion the ship would steam into a bay with the anchor down on a 10-fathom cable, but this safeguard was not possible in narrow ways, as had the anchor taken the bottom the vessel would probably have immediately swung on to the danger.

The survey ended, the *Discovery II* returned to Deception Island and transported the dogs and stores of the Graham Land Expedition to Port Lockroy, leaving them there in charge of Surgeon-Lieutenant BINGHAM and Mr. HAMPTON. *Discovery II* did not again meet the *Penola*, which had been detained over a month at the Falklands with engine trouble. Port Lockroy was left on January 19, and later came word that RYMILL himself had arrived there with his own ship to pick up BINGHAM, HAMPTON and the dogs.

Work for RYMILL and for BYRD might make it appear as if the ship had become a maid-of-all-work and common carrier. For a few days in January it looked as if this might once again be the case. Throughout December and January Mr. Lincoln ELLSWORTH and Sir Hubert WILKINS had been making attempts to find a base on one or other side of Graham Land, so as to be able to fly across the Antarctic continent to the Ross Sea. In January ELLSWORTH's ship, the *Wyatt Earp*, was at Snow Hill in the Weddell Sea. Retreating from there northwards he was caught in the ice, and on January 15 the *Discovery II* received a wireless message asking if she would stand by at Deception Island and receive some of ELLSWORTH's party by plane in the event of a forced wintering. The alarm was, however, premature, and the season still early, and the *Wyatt Earp* was clear of the ice four days later. The incident is worth mentioning to show the reputation the research ship now holds in the Antarctic seas.

The *Discovery II* was back at South Georgia on January 27. She was now homeward bound, but only after a further run towards Enderby and thence to Capetown. This work was very much the same as that done previously, but carried out earlier in the season. Many ships were about, large factory ships and the smaller catchers. Of most interest, however, was the near presence of the whale marker, *William Scoresby*. The ships never met but there was frequent talk by wireless. They are working towards the same objective, though by different methods. *Discovery II* has now almost completed exploring the whale's habitat and the life-history of its food-supply; the *William Scoresby* has only just begun marking the whales in order to know whence and where they travel, at what speed and in what numbers (1). *Discovery II* was first to leave the south, but the *Scoresby* reached London before her, for from Capetown the bigger ship's route took her south-east to Marion Island, and from there northwards through the Indian Ocean and home *via* the Suez Canal. She will be in London for a few months only, as she is already under orders to leave again in the autumn for her fourth commission (2).

(1) *The William Scoresby, with Mr. G. W. Rayner in charge, succeeded in marking a minimum of 729 whales; and during the same period Mr. A. H. Laurie, in a catcher hired at South Georgia from a whaling company, is estimated to have marked a further 467. Already about 40 of the marks have been recovered, and give an indication of the route which the whales take. It seems evident therefore that a proper form of marking has at last been found, and that this method of investigation will succeed.*

(2) Note by the I.H.B. — *The R.R.S. Discovery II left London on her fourth voyage early in October, under the command of Lieutenant L. C. Hill, R.N.R.*

NOTE (see *The Polar Record*, p. 140) — The indiscriminate slaughter of whales which has been causing considerable trepidation among experts of late years will now be partly checked by a Convention of the League of Nations, which took effect from January 16, 1935. This Convention forbids the killing and taking of calves, immature whales or females accompanied by suckling calves. Annual reports on the results of the convention are to be prepared by the International Bureau of Whaling Statistics, Oslo.

It is also reported that the 1935-36 whaling season will be reduced to three and a half months from December 1 to March 31 by both British and Norwegian companies.

