

ANNEX V

## THE ROYAL SOCIETY

UNITED KINGDOM IOE PROGRAMMESNEWSLETTER NO. 4 JANUARY 1964RRS DISCOVERY - amended 1964 programme

For several reasons it has proved necessary to modify the programme of the R.R.S. Discovery in the Indian Ocean in 1964. The main considerations in deciding on the new programme have been the following:

Since the ship will not be ready to sail from Plymouth before mid-February, the winter survey of the Arabian Sea cannot be made without extending the ship's stay in the Indian Ocean by about six months beyond September 1964.

The summer survey, consisting of east-west sections on 20°N, 16°N, 12°N, 8°N and the Equator, would duplicate much of the Atlantis II survey in 1963.

The work on equatorial currents had been planned on similar lines to that of Knauss in the Argo in 1962-1963. His results show already that there is no well-defined undercurrent on the equator in summer in the Indian Ocean, and it seems more profitable to extend the equatorial current work southwards, to include the south equatorial current, than to concentrate exclusively on the Equator.

The results of the survey of the upwelling off the Arabian coast in June-August 1963 suggest that repeat sections should be made at other seasons.

The proposal by Stommel and Wooster for a study of the Somali current in August 1964 offers an attractive opportunity for co-operative work.

The following changes have therefore been made in the programme:

The east-west sections have been abandoned completely and replaced, in the main, by north-south sections on 58°E and 68°E, crossing the Equator and extending to 20°S. The equatorial current work will be concentrated within these sections, between 5°N and 15°S, and each section will be occupied twice.

Three more visits are planned to the south Arabian coast, where a section running 200 miles offshore from the Kuria Muria Islands will be reoccupied in March, May and September.

Hydrographic sections and current measurements will be made in the Somali current during August in co-operation with the U.S. research vessel Argo.

Hydrographic stations will also be worked on passages between the areas specified above; in particular, there will be a section from Cochin north west towards Ras al Madraka on the southern coast of Arabia; and four sections across the south equatorial current during the passage from Mauritius to Mombasa, before starting the Somali current work. The total effort should still make a substantial contribution to the general survey of the Arabian Sea, while simultaneously putting more emphasis on the specific projects on the south Arabian coast, in the equatorial currents and in the Somali current.

The proposed itinerary is as follows:

14 February	Depart Plymouth	Passage out with some stations in Mediterranean and Red Sea.	19 days
4 March	Arrive Aden		
7 March	Depart Aden	Proceed to Indian Ocean Reference Station No. 12 and then to Kuria Muria Island. Attempt landing on Hasikiya Island. Hydrographic Section from there to 15°N, 58°E and then south to Mauritius. Close stations (30-mile intervals) between 5°N and 15°S. Nine days available for special work.	29 days
5 April	Arrive Mauritius		
10 April	Depart Mauritius	Proceed east to 20°S, 68°E and then north to 9°N. Close stations again between 15°S and 5°N and extra work both in south equatorial current and on Equator. Visit to Chagos Islands if possible. Section to Cochin.	29 1/2 days
9 May	Arrive Cochin		
12 May	Depart Cochin	Proceed to 10°N, 68°E and then hydrographic section to Ras Madraka. BT Survey to Kuria Muria Islands, then section to 15°N, 58°E and south to 5°S. Work on equatorial currents and then passage to Seychelles.	25 days

6 June	Arrive Seychelles	
9 June	Depart Seychelles	
		Proceed to Equator in 58°E and Section east along Equator to 68°E. Section south to 16°S and then to Mauritius. Extra work on Equator. 22 days
1 July	Arrive Mauritius	
5 July	Depart Mauritius	
		Section north to 5°S in 58°E then to 12°S, 50°E. From this position another section will be run north to 4°S and then west to Mombasa. Possible visits to Cargados Garajos and perhaps Agallega. 23 days
28 July	Arrive Mombasa	
2 August	Depart Mombasa	
		Work in Somali current with U.S. Research Vessel <u>Argo</u> . 21 days
23 August	Arrive Aden	
26 August	Depart Aden	
		Proceed to Kuria Muria Islands and repeat section to 15°N, 58°E. 14 days
9 September	Call at Aden	
		Passage Home and work in Red Sea 19 days
28 September	Arrive Plymouth	

#### Routine Stations

The sections off the Arabian Coast will consist of stations at 10-mile spacings on the continental shelf and slope and at 30-mile spacings in deep water. Where the bottom is greater than 1,000 m., stations will be worked alternately to the bottom and 1,000 m. depth.

On the oceanic sections, there will be two stations daily, one to 1,000 m., the other to the bottom. These stations will therefore be some 90 miles apart.

In the equatorial region between 5°N and 15°S, stations will be at 30-mile intervals alternately going to 1,000 m. and the bottom.

#### Other projects

An allowance of time has been made in each part of the programme for current measurements, mid-water trawling, deep plankton hauls, visiting islands and any special sampling required.

Chemistry

Temperature and salinity will be measured at all standard depths on all stations. Dissolved oxygen and nutrient analyses will be made only at selected depths.

Biology

Biological sampling will be adjusted to suit the different phases of the programme, but will incorporate both phytoplankton and zooplankton collections in the upper 1,000 m. and at greater depths at a few stations.