

SCOTTISH MARINE BIOLOGICAL ASSOCIATION

Dunstaffnage Marine Research Laboratory

Cruise Report

R.R.S. CHALLENGER

Cruise 13/1980

2 - 8 September 1980

R.R.S. CHALLENGER, Cruise 13/1980

Duration of cruise: 1014 h 2 September - 1605h 8 September 1980  
Times BST unless otherwise specified.

Locality: Rockall Channel & Scottish continental shelf.

Staff:  
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Aims:

- 1) To service S.M.B.A. deep current meter mooring F (57°32'N 12°17'W) and shelf mooring R (57°N, 9°W).
- 2) To work the western half of the Anton Dohrn Seamount CTD section.
- 3) To work CTD sections on the shelf from St. Kilda southward, with oxygen and nutrient sampling in the bottom waters.
- 4) To measure chlorophyll concentration over the continental shelf and shelf-edge.
- 5) To collect 50 litre water samples for radiocaesium analysis at ten standard positions between the shelf-edge and the Sound of Mull.
- 6) To tow standard and fast plankton recorders for comparative tests.

Narrative: CHALLENGER sailed from Barry in fine calm weather at 1014 h 2 September. The plankton recorders were streamed at 1208 h for initial depth tests and upon the completion of these were towed at 10 m depth until 1204 h 3 September when they were brought inboard for passage of the North Channel. The ship proceeded via the Sound of Islay to the first radiocaesium position off Tobermory, calling off Dunstaffnage between 0700 & 0755 h 4 September to collect the fluorometer and

accessories which were brought out by HARVEST LILY. Caesium sampling began at 1058 h. The steering gear hydraulics had been a source of concern and after collecting the second sample in the Tiree Passage the ship hove-to from 1135 to 1400 h to enable the engineers to clear air from the system. Surface sampling continued to Barra Head with the plankton recorders streamed, but in view of continuing steering gear problems the ship stopped from 2002 to 2047 h to change over steering motors. Subsequently the plankton recorders were again streamed and the radiocaesium sampling was completed at 0112 h 5 September.

Course was set for the current meter mooring at station F, west of Anton Dohrn Seamount and an acoustic search was begun at 1424 h. The mooring was located and the release triggered at 1500 h, but the mooring failed to rise. Absence of a discrete bottom echo suggested that the release was lying on the sea-bed without buoyancy and grapnels were therefore rigged and towed on 6000 m of warp in three passes across the position between 1631 and 2001 h. Although one fluke of the Mersey grapnel was scored by wire marks, the general absence of polishing on the grapnels suggested that the gear had not been on the bottom, and a second attempt was made with 8000 m of warp out between 2010 & 0013 h 6 September. Despite a close approach to the release, no contact with the mooring was made, and with signs of deteriorating weather it was decided to abandon the search in order to service the shelf-edge mooring during daylight hours of 6 September.

The vicinity of mooring R was reached at 1415 h and after a search the spar-buoy was sighted at 1515 h. A replacement mooring

was rigged and laid between 1710 & 1740 h. The existing mooring was retrieved between 1843 & 1916 h. A CTD lowering was made and at 2002 h course was set for the outer station of a section from the shelf-edge towards Barra.

Winds during 6 September were south-westerly, forces 5 - 6, though freshening somewhat during squalls. The section of six stations of CTD and water-bottle lowerings was completed between 2350 h 6 September and 1118 h 7 September, and the ship headed for station C9 to work a similar section eastwards to Barra Head. A moderate south-westerly swell with winds occasionally reaching 40 kt slowed the ship to 5 kt, however, and it became apparent that only station C8 could be worked if arrival at Ardrossan for the evening tide was to be assured. Poor conditions at C8 limited work to a CTD lowering and at 1835 h CHALLENGER set course for Ardrossan at reduced speed. The plankton recorders were streamed until the Mull of Kintyre was reached at 0545 h 8 September, and in improving weather the ship docked at Ardrossan at 1605 h.

Results Aim 1) The acoustic release for mooring F was found to be lying on the sea-bed, indicating that the near-surface buoyancy had broken adrift or had collapsed. As the mooring had been deployed just over four months previously, it seems unlikely that this could be the result of corrosion and suggests that the buoyancy sphere had been removed by a mid-water trawl or had collapsed as a result of 'knock-down' due to strong currents. In view of the second possibility, it was decided to defer re-laying of the mooring to early October in order to consider alternative

mooring configurations. Dragging with the IOS grapnel/  
transponder rig may be possible at this time also.

Mooring R, at the shelf-edge, was recovered and re-laid satisfactorily. The two Aanderaa meters, at depths of 35 & 105 m, appear to have recorded correctly and should yield 97 days' data.

Aim 2) Time did not permit the working of any Anton Dohrn Seamount section stations.

Aim 3) One CTD section was worked on the shelf to the west of the Hebrides. Water-bottle samples for chlorophyll content were taken at five depths and oxygen samples <sup>at</sup> four. Temperatures in the bottom water of 9.5°C over the central shelf region suggested the persistence of water formed during the previous winter.

Aim 4) Chlorophyll concentration was measured along most of the ship's track using the Portaferry Amincom fluorometer. The S.M.B.A. Turner instrument was used on 4 February, but developed a fault as a result of range switching. In addition to the surface observations, chlorophyll samples were taken in the upper water-column on a shelf section to the west of South Uist, as noted under Aim 3 above.

Aim 5) Surface samples for radiocaesium analysis by the Fisheries Radiobiological Laboratory were taken at ten standard positions between Ardmore Point, Mull and the shelf-edge mooring on 4 September. Time did not permit CTD sampling, but lowerings were later made on 6 & 7 September at stations C10 and C8.

Aim 6) A Hardy Plankton Recorder and Fast Plankton Recorder were towed at 10 m depth during the longer passages made by the ship in order to compare sampling characteristics of the two instruments. Although some data-logging faults occurred initially, these were overcome and satisfactory records were obtained.

D. J. Ellett

12 September, 1980.

