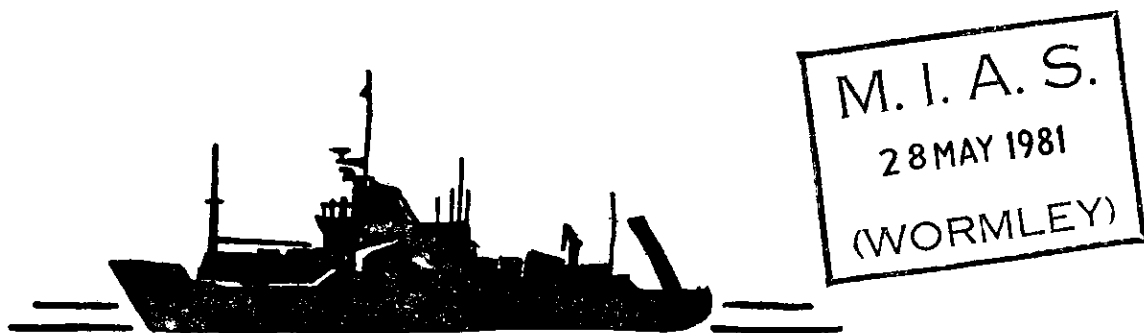


Scottish Marine Biological Association

Dunstaffnage Marine Research Laboratory



CRUISE REPORT

R.R.S. CHALLENGER

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SCOTTISH MARINE BIOLOGICAL ASSOCIATION

Dunstaffnage Marine Research Laboratory

Cruise Report

R.R.S. CHALLENGER

CRUISE 6/1981

6 - 25 APRIL 1981

R.R.S. CHALLENGER, Cruise 6/1981

Leg A

Duration: 1730 h 6 April - 0740 h 15 April 1981

All times BST unless otherwise specified.

Locality: Rockall Channel and Scottish continental shelf

Staff: D.J. Ellett

Dr. J.D. Gage

D.J. Edelsten

Dr. D.A. Booth

N.D. Pascoe

Mrs. M. Pearson

Miss S. Pain (Univ. Coll. of Swansea)

J. Wright (Univ. Coll. of Swansea)

M. Townley (Univ. Coll. of Swansea)

P. Leahy (Univ. Coll. of Galway)

Aims:

- (1) To service SMBA current meter mooring R and to re-lay moorings F & M.
- (2) To carry out seasonal benthos sampling and Agassiz trawl hauls in the southern and central Rockall Trough.
- (3) To service the SMBA corrosion potential current meter (CPCM) off South Uist.
- (4) To work the Anton Dohrn Seamount CTD section.
- (5) To examine bottom topography at the sites of future moorings to the west of Porcupine Bank.
- (6) To collect 50 litre water samples for radiocaesium analysis and CTD profiles at standard positions between the shelf-edge and the Sound of Mull.

Narrative:

CHALLENGER sailed from Barry at 1730 h 6 April after delays occasioned by difficulties in winding on a new hydrowire. In excellent weather course was set for Fastnet, which was rounded at 1925 h 7 April. A test CTD lowering was made at 1342 h 8 April on the crest of the southward extension of Porcupine Bank, and from 1413 h until 0230 h 9 April a sounding run was made westwards into deep water. From soundings of 3700 m course was set for the seasonal benthos sampling site, but en route opportunity was taken for an Agassiz trawl haul from 0823 to 1330 h.

The benthos site was reached at 0857 h 10 April and an epibenthic sledge haul made until 1412 h. CHALLENGER then headed northwards for the position of mooring F, stopping to test acoustic releases from 1936 until 2248 h. Further release tests were made upon arrival at F at 1200 h 11 April, and laying of the mooring occupied from 1248 to 1436 h. The northerly winds had risen from force 3 to force 7 during the early afternoon and it was decided to steam for the second mooring position, M. This was reached at 2236 h, and overnight an epibenthic sled haul and Agassiz trawl were made in the vicinity. Upon their completion at 0836 h 12 April the ship returned to position and the mooring was laid between 1200 and 1354 h, when course was set for the shelf-edge mooring, R. Weather had improved during the day, and the wind had dropped to force 5 when recovery of the mooring began at 1830 h. All equipment was inboard at 1930 h. A replacement mooring was wound on to the winches in readiness for the following morning and the ship steamed west to make a rectangular mid-water trawl (RMT) haul over deep water between 2230 and 2258 h

13 April. Six CTD stations of the Anton Dohrn Seamount section were worked on the return across the continental slope, and at 0902 h re-laying of mooring R began. This was complete at 0934 h and three CTD and radiocaesium sampling stations were worked across the continental shelf until 1412 h, when the ship proceeded to the CPCM mooring position off South Uist. The mooring was recovered in fine weather between 1750 and 1837 h, and CHALLENGER returned to continue caesium stations C8 to C1 between 2226 h and 0802 h 14 April. With several hours in hand, it was decided to work CTD stations between Loch Moidart and Loch Bracadale en route to Stornoway, and eleven of these (D8 to D3 and E1 to E5) were completed between 1140 and 2012 h. The ship steamed through the Little Minch, arriving at Stornoway at 0740 h 15 April.

Results:

Aim (1)

Mooring R was recovered and re-laid on 12 and 13 April. The upper Plessey current meter at 45 m nominal depth had leaked due to corrosion around the thermistor mounting, but the lower meter at 110 m depth appeared to have functioned correctly during the previous 72 days since the mooring was laid on 30 January, completing 13 months of continuous observations at this depth.

Moorings F and M, each carrying four Aanderaa current meters, were deployed on 11 and 12 April respectively, and details are given in Table 1.

Aim (2)

Successful hauls were made on both the permanent station at 2900 m and at station "M" obtaining good samples of benthic macro- and megafauna, respectively, that continue seasonal time series started in 1975 and 1978. A single attempt to obtain an exploratory sample with the Agassiz trawl at a position in the deep water (ca 3300 m depth) in the extreme southern part of the Rockall Trough was unsuccessful, probably because of insufficient payout for bottoming the gear.

Deep frozen material from the station "M" Agassiz haul was later sent for analysis at the Fisheries Radiobiological Laboratory at Lowestoft (Dr. R.J. Pentreath). Gonadal tissue from species of sea stars under current study by Dr. P.A. Tyler and Miss S. Pain of the University College of Swansea was dissected from fresh material obtained from this Agassiz haul for subsequent histological and histochemical studies that are part of a continuing collaboration with Dr. Gage.

A single haul for deep plankton using the Rectangular Midwater Trawl (RMT) framework recovered a particularly rich haul that was later sent to Swansea for examination by Dr. Tyler for larval forms of benthic species.

Aim (3)

The current meter monitoring corrosion potential off South Uist was recovered on 13 April, after 75 days' deployment at a nominal depth of 26 m. All appeared well with the CPCM, which after servicing was to be re-moored during leg B of the cruise. The pick-up line and floats of the U-shaped mooring array had been

removed, but fine weather allowed recovery of the spar buoy without too much difficulty. The SMBA toroid carrying fouling experiments was in position close by, as was the Taunton waverider.

Aim (4)

The Anton Dohrn Seamount CTD section was not worked on this leg due to priority being given to the mooring work. Six closely spaced stations of the section (O to R) were worked across the slope region on 13 April, and as in late January, the stations with least vertical structure were P' and Q in 620 and 290 m depth.

Aim (5)

Precision echo soundings were made in latitude $52^{\circ}30'N$ between 14° and $17^{\circ}W$ on 8-9 April with a view to assessing the best depths for laying moorings later in 1981. The continental slope was steepest between depths of 1800 and 3000 m where the gradient was about 1 in 6, and it appears that the slope zone might be best examined by two moorings in depths of 1600 and 3050 m.

Aim (6)

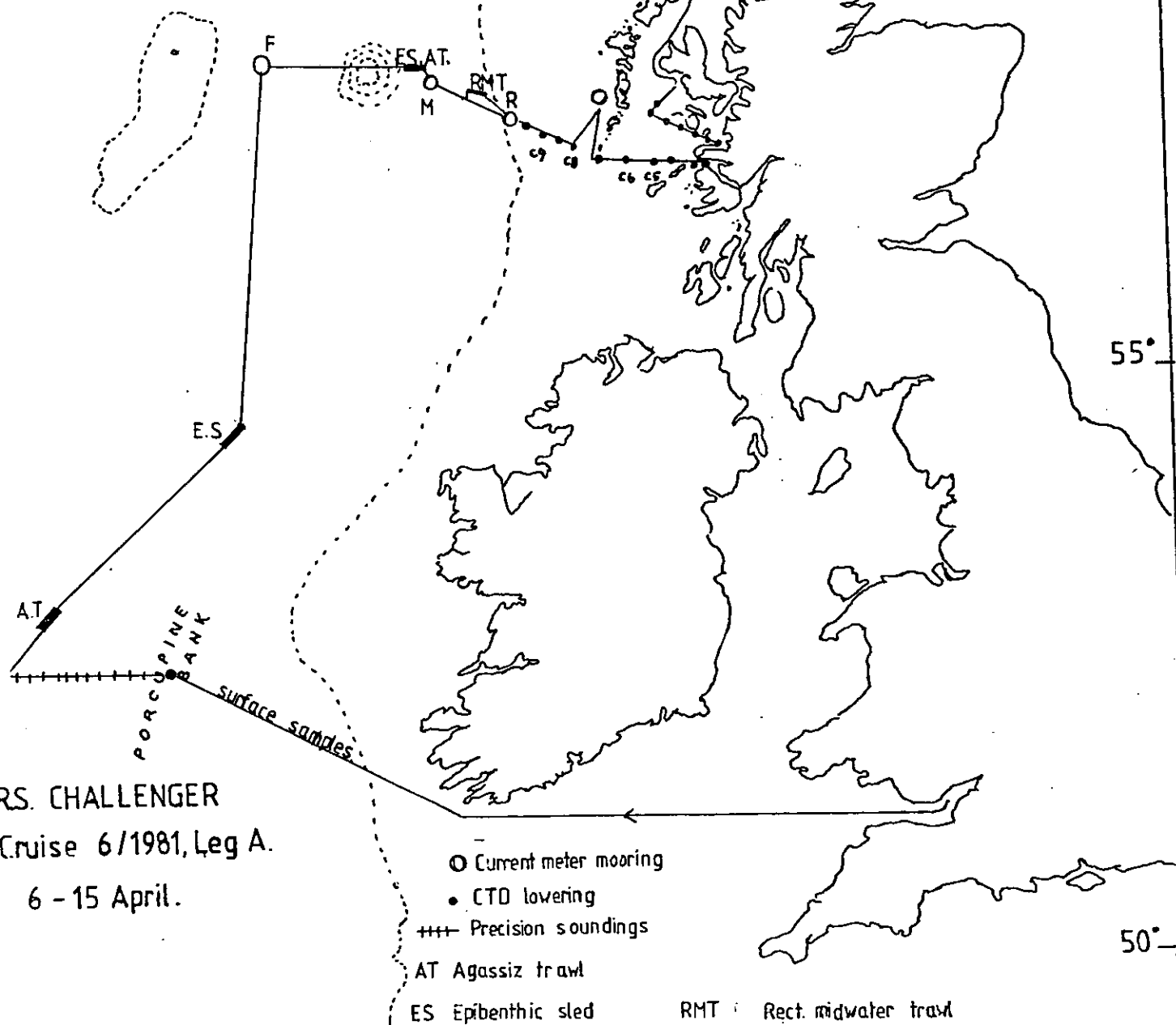
Water samples for radiocaesium analysis by the Fisheries Radiobiological Laboratory were collected at all ten positions between the shelf-edge and Ardmore Point, Mull, and CTD lowerings were made at all except the last position.

Miscellaneous

- (a) A CTD section from Loch Moidart past Oigh Sgeir was worked on 14 April, together with another at right angles running into Loch Bracadale, Skye.
- (b) Surface salinity and temperature samples were taken during the longer periods of steaming.

- (c) A large number of replicate salinity samples were taken in order to provide duplicate samples for determination upon the Autolab salinometer and a third sample for determination upon the Ocean Weather-Ship Base Guildline machine.

RRS. CHALLENGER
Cruise 6/1981, Leg A.
6 - 15 April.



Leg B

Duration of Cruise: 1130 h 16 April - 1415 h 25 April

All times BST unless otherwise specified.

Locality: Rockall Channel and Scottish continental shelf

Staff:

R. Bowers

D.T. Meldrum

D.J. Edelsten

Dr. J.M. Graham

N.D. Pascoe

J. Cherriman

G. Phillips

R. Wallace

Miss A. Ashcroft

P. Johnston

I.O.S. Wormley

Marine Biology Station, Portaferry

Aims:

- (1) To service IOS current meter moorings I1 to I4 and to retrieve an experimental mooring in $56^{\circ}49'N$, $09^{\circ}16'W$.
- (2) To re-lay the corrosion current and potential meter (CPCM) off South Uist.
- (3) To measure chlorophyll concentrations over the shelf and shelf-edge.
- (4) To do CTD sections as time permits.

Narrative:

16 April. Sailing was delayed until 1130 h due to a sick steward. After passing the Butt of Lewis we headed for I2. Surface chlorophyll, conductivity and temperature records were started and continued throughout the cruise. Five stations were worked across the shelf edge starting in 191 m and finishing in 1060 m at 0200 h on 17 April. Each station consisted of chlorophyll profiles to 60 m, bottle samples

to 60 m and CTD profiles to the bottom. On the completion of the section we steamed on, stopping at 0830 h for a wire test. We arrived at I2 at 1100 h, popped the mooring up at 1200 h, recovered it and laid a new mooring by 1500 h. We then did a chlorophyll and CTD station 2 miles to the west of the mooring and sailed for I1, stopping in the evening to do wire tests. We arrived at I1 at 0615 h on 18 April. This was popped up and a new mooring laid by 1000 h after which we sailed for I4, reaching it at 1745 h. After locating the mooring we stood off for 2 miles and did a CTD and chlorophyll station. (The chlorophyll profile had to be abandoned at 40 m due to a leaking connection on the fluorometer). We then returned to I4 which was released and recovered and a new mooring laid by 2200 h. We then steamed for I3 which was reached at 0810 h 19 April. The laying of the mooring was completed by 1000 h when course was set for Rockall, reaching it at 1840 and we then commenced the Anton Dohrn CTD section. Chlorophyll stations were worked at A, B, C, D, I, J, K, Q, R, S and T. The section was completed at station T at 0830 h 21 April and then since the weather forecast was deteriorating, we headed for the IOS experimental mooring (X) which we reached at 1230 h, popped-up and recovered by 1350 h. We then did a CTD dip and took oxygen samples at X, leaving at 1440 h for the end of the A section which was started (A0) at 1920 h and finishing (A8) at 0830 h 22 April. Chlorophylls were worked at A0, A1, A2 and A3. We then went and searched for a gap between the lobster pots to lay the Wilson Picket corrosion current and potential meter mooring. A space was

eventually found and the mooring laid, finishing at 1012 h. We then sailed and completed station A9 and then commenced the B section at 1220 h finishing it at B12 at 0270 h 23 April.

Chlorophylls were worked at B6 to B10. Having completed the B section there was just time to steam to Rosemary Bank and do a section of 8 stations between its top and the Flannan Isles. This section was commenced at 1510 h and finished at 0840 h 24 April. Chlorophylls were worked on the 5 shallower stations. After the completion of this section we sailed for Ardrossan, docking there at 1415 h 25 April.

Results:

The weather was excellent for most of the cruise and as a result all of the objectives were achieved. All of the existing moorings were recovered and all of the current meters - with one exception - appeared to have worked well. The exception had the tape head detached and the tape will have to be analysed to see how much record was lost. The experimental mooring (X) was recovered in excellent condition (if slightly tangled at the end) after being deployed for a year less 4 days. Five new moorings were deployed.

The success of the cruise also owed a lot to the excellent repair work carried out by the cruise members. During the cruise: (1) a lead to one of the PES transducers leaked; (2) A tail on the CTD leaked; (3) A tail on the CTD went open circuit; (4) a Fluorometer connection leaked; (5) A smoothing capacitor in a fluorometer broke down; (6) A pressure switch on

a pinger leaked; (7) The Irish spooling gear played up.

(Fortunately the hauling side worked perfectly throughout the cruise).

All of these problems were overcome quickly and effectively.

Acknowledgements

Thanks are due to Captain G. Selby-Smith, his officers and crew for their help in making this cruise so successful.

Particularly I should like to thank C. Storrier for continuing his work on the hydrographic spooling gear.

Table 1. SMBA Current meter moorings laid during cruise 6/1981Table 2. IOS Current meter moorings laid during cruise 6/1981

Mooring	LAT. (N)	LONG. (W)	
R	57° 00'	9° 00'	} Table 1
F	57° 30'	12° 15'	
M	57° 18'	10° 23'	
CPCM	57° 18'	7° 40'	

I1	60° 00 $\frac{3}{4}$ '	12° 06'	} 18/4 17/4 Table 2 17/4 18/4
I2	60° 12 $\frac{1}{2}$ '	9° 14 $\frac{3}{4}$ '	
I3	58° 56'	13° 15'	
I4	58° 50 $\frac{1}{4}$ '	11° 34 $\frac{3}{4}$ '	

Table 3. Details of stations worked: depths given in corrected metres (Matthews, 1939).

Station	SMBA Sta. No.	Gear	Date	Time on bottom (GMT)	Position (estimated mid-point of bottom haul where applicable)	Depth	Result
	—	Agassiz Trawl (AT)	09 April	—	53°01'N 15°57'W	3300	Gear not bottomed
Permanent Station	ES 185	Epibenthic sled (ES)	10 April	1020- 1150 hr.	54°44'N 12°15'W	2907	Large sample, including some megafauna. Bottom track ca 1 naut. mile.
Station "M"	AT 186	AT	12 April	0515- 0620	57°22'N 10°19'W	2170	Good catch of all mega- faunal species under current study. Bottom
"	RMT 187	Rectangular mid water trawl 1 m ² net only.	12 April	2230- 2250	57°07'N 09°29'W	Fishing depth ca 1000 m	Excellent catch includ. lantern and hatchet fish.

