Scottish Marine Biological Association

Dunstaffnage Marine Research Laboratory

Cruise Report

R.R.S. CHALLENGER

Cruise 1/1979

9 to 21st January 1979.

RRS CHALLENGER, Cruise 1/1979

Duration: Leg 1 1600 9th January to 0900 17th January.

Leg 2 1300 17th January to 1030 21st January.

Leg 1

Locality: Rockall Channel & Scottish Continental Shelf.

Staff:			
	A. Edwards	Chief Scientist	SMBA
	R. Bowers		"
	J.D. Gage		"
	D. Edelsten		"
	D. Booth		"
	A. Souter		"
	Mrs M. Pearson		"
	N. Pascoe		"
	J. McLachlan		"

Aims: a) Hydrographic

1) To service SMBA current meter mooring at 57°N 9°W.

2) To work the Anton Dohrn Seamount CTD section.

3) To collect 50 litre water samples at standard positions for radiocaesium analysis.

4) To make a bottom survey N.W. of Barra Head using side scan sonar (for I.O.S. BIDSTON)

b) Benthic

5) To obtain an epibenthic sled sample of the abyssal macrobenthos at the SMBA Permanent Station, 54°40'N, 12°16'W in 2900 m water in order to continue a long-term time series.

6) To obtain samples of deep plankton at the Permanent Station using the small rectangular mid-water trawl (RMT 1).

7) To obtain hauls of the benthic megafauna using an Agassiz trawl in order to continue seasonal studies.

Narrative: CHALLENGER sailed from Barry at 1600 h 9th January in a fresh westerly wind. During the night the wind freshened to a strong gale from the North West and on the 10th January the ship sought shelter off ARKLOW. In view of the forecast, passage through the Irish Sea was abandoned and on the evening of the 10th passage was started round the south of Ireland. The station at 54°40'N 12°16'W was reached on the morning of 13th January: the benthic sledge was deployed during the forenoon with a satisfactory yield of biological material: a Rectangular Midwater Trawl (RMT) was used in the afternoon but was lost before recovery: the ship then left for current meter work at 57°N 9°W. (Station R). On arrival at station R, swell was too heavy to lay the current meter mooring and the ship was hove-to until early afternoon on the 15th January, when the mooring was successfully laid in 137 m of water. With little daylight remaining for recovery of an older mooring at R, it was decided to spend the night working an Agassiz trawl at

station M (57°18'N 10°22'W). This was successfully done, and the ship left station M early on the 16th January to search for the old mooring at R. The mooring was sought during daylight on the 16th and could not be found. A grapnel was dragged around the area where the buoy had been laid, without success. The search was abandoned in the late afternoon and the ship returned to Dunstaffnage, collecting samples for caesium analysis en route. Personnel and equipment from leg 1 were taken off by R.V. Calanus at Dunstaffnage during the morning of 17th January.

Results: a). Hydrographic

Aim 1). A new current meter mooring was successfully laid at station R. The mooring that was to be recovered could not be found by eye, by radar or with a towed grapnel.

Aim 2). Because of time lost to bad weather and the need to give priority to current meter servicing, the only time available to make CTD observations was during the night of January 15th/16th. The scientific value of one good Agassiz haul seemed greater than completion of a very small part of the Anton Dohrn CTD section and therefore the CTD programme was scrapped in favour of the biological work at station M. (See Aim 7).

Aim 3). 50 litre water samples were collected as planned, but the usual accompanying CTD observations were cancelled because time had been spent in searching for the mooring at station R.

Aim 4). The side scan sonar work had to be cancelled because of the accumulated time losses.

Results: b). Benthic

Aim 5). The single deployment of the epibenthic sledge yielded a satisfactory haul from the deep benthic permanent station (see Table 2 for details of biological hauls during the cruise). This haul continues the seasonal time series that was initiated in 1975. Preliminary examination of the sample after washing on deck revealed a rich sample with good representation of those species under current study.

Aim 6). The attempt at obtaining a sample of deep-water plankton was thwarted by loss of the RMT during its recovery from a deep tow. The loss probably occurred with about 500 m of wire still out when the wire suddenly jumped off the inboard sheave over the winch. A paper record of wire tension during the operation revealed a marked drop in load at this point which was finally confirmed as loss of the rig when the end of the wire was recovered. The break had occurred at the shear-pin weak-link device (pin rated at 3 tons) that had inadvertantly been rigged onto the trawl after the previous sledge tow. At no time did wire tension exceed 2.5 tons during the haul and it is surmised that the shear pin broke either as a consequence of fatigue or perhaps through catching a large midwater object.

Aim 7). The single haul with the Agassiz trawl between the Anton Dohrn Seamount and the Hebridean Slope (SMBA CTD and current meter mooring station "M") that had been fished previously on Challenger cruises 6/78 and 9/78 again yielded a rich haul of mainly epibenthic megafauna (Table 3) including some fish and an octopus. Good samples of the echinoderms

Ophiommsium lymani, Ophiura liungmani, Ophiiacantha bidentata, Echinus elegans, Bathybiaster vexillifer, Pontaster tenuispinus and Hymenaster ?pellucidus were obtained for reproduction and population studies (Dr P.A. Tyler, Univ. Coll. Swansea in collaboration with JDG). Large samples of a variety of other species included in Table 3 were also obtained.

Acknowledgement

We are grateful to Captain Maw and the ships officers for their help in this work.

Table 1. Details of current meter moorings set during CHALLENGER cruise 1/1979.

Station	R
Position	57° 00.9'N 9° 01.7'W
SMBA Mooring No.	49
Sounding (m.)	138
Nominal depth of sub-surface float (m)	34
Nominal meter depths (m.) (Both have temperature sensors)	43 113
Sampling frequency	10 mins
Laid at (GMT)	1403 h 15 January 1979.

Table 2. Benthic sampling stations (all depths given corrected using Mathews (1939) Tables of the Velocity of Sound in Pure Water and Sea Water).

Date	Benthic operation no.	Approx. times gear on bottom (hrs GMT)	SMBA Benthic Stn. no.	Positions at start and finish of haul	Depth (m)	Gear	Result
13 Jan	1	1000-1100	152	54°42'N 12°19'N to 54°20'N 12°20'N.	2900	Epibenthic sledge (ES)	Satisfactory sample
13 Jan	2	N/A (gear fished from 1300 to approx. 1607 hrs when it probably parted from wire)	-	54°37'N 12°12'N to 54°35'N 12°08'N.	2921	Rectangular midwater trawl (RMT) 1 + 7	Gear lost
15/16 Jan	3	2330-0100	153	57°20'N 10°27'W to 57° 'N 10° 'W	2190-2215	Agassiz Trawl (AT)	Good sample

Table 3. Listing of preliminary identifications of benthic fauna in Agassiz Trawl haul* (AT 153) on 16 Jan. 1979.

Identification	Number in haul
Porifera	
sp. indet	12
?Porifera sp.	1
Gorgonacea	
Acanella arbuscula Johnson	Many colonies and fragments
Madreporaria	
Fungiacyathus marencelleri (Vaughan)	42
Caryophyllia ambrosia Alcock	3
Actinaria	
Phelliactis ?robusta Carlgren	4
sp. indet.	

Identification	Number in haul
Polychaeta	
Harmothoidae Lagisca hubrechti (McIntosh)	38
Sigalionidae Leanira hystricis Ehlers	7
Crustacea	
Cirripedia sp. indet.	1
Malacostraca sp. (probably pelagic)	Not counted
Eryonidae Polycheles sculptus (Smith)	27
Galatheidae Munidopsis ?curvirostris Whiteaves	41
Pycnogonida	
Collossendeis collossea Wilson	1
Gastropoda	
Buccinidae Colus sp.	27
" sp. indet	2
Neptunidae Tacita ?abyssorum Locard	2
Fasciolaridae Troschelia berniscensis	1
Turridae Brachytominae Belomitra paradoxa Fischer	1
sp. indet	1

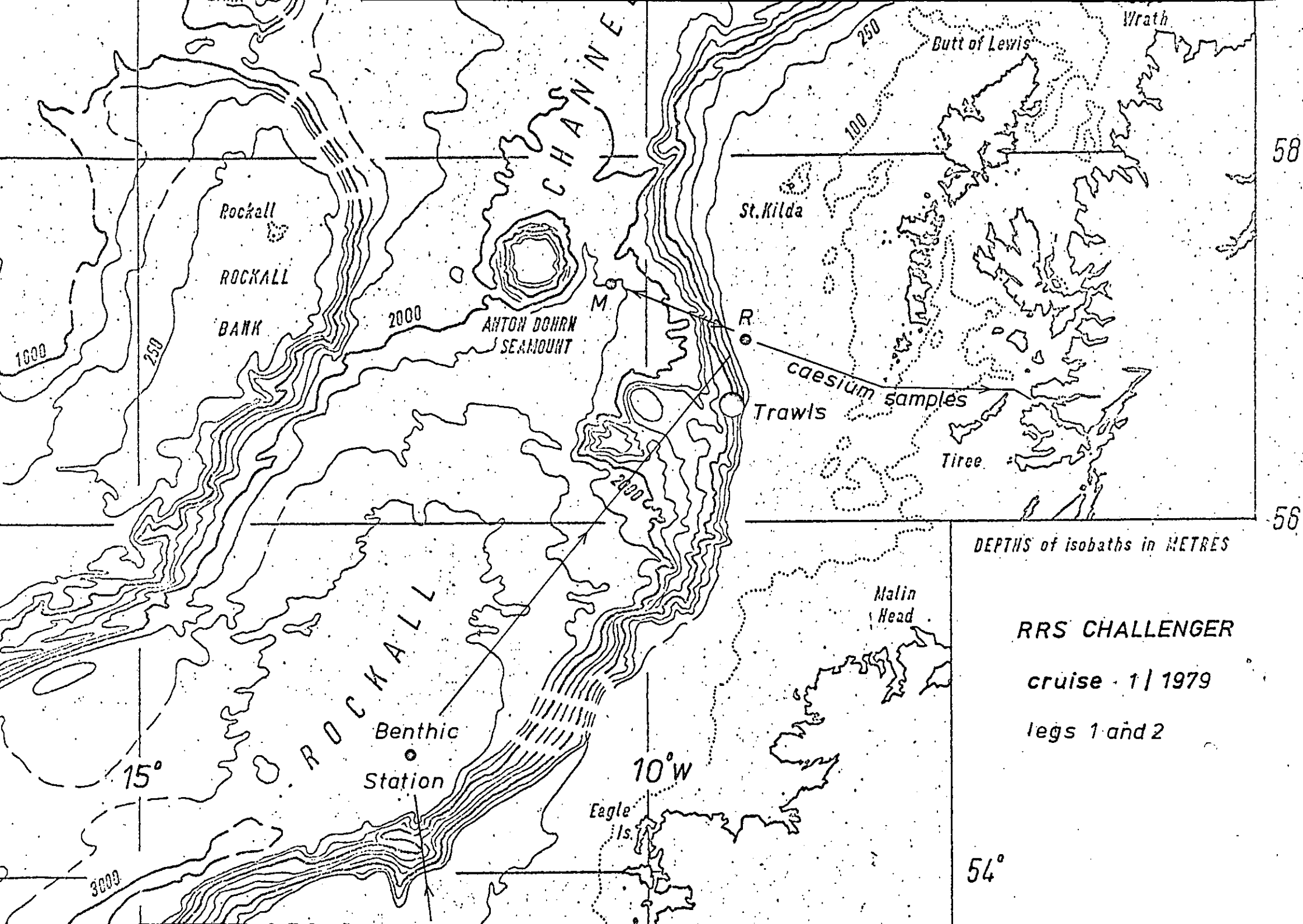
Identification	Number in haul
Muricidae *Trophon* sp.	2
Scaphandridae *Scaphander* sp.	3
Atyidae *Cyclichrium africanum* Locard	1
Gastropoda spp. dead shells	
Bivalvia	
Malletiidae *Malletia obtusa* G.O. Sars	1
Scaphoda spp. dead shells	
Cephalopoda	
Octopodacea sp.	1
Asteroidea	
Bathybiaster vexillifer Wyv. Thomson	22
Pontaster tenuispinus (Duben & Koren)	73
Hymenaster ?pellucidus Wyv. Thomson	203
Dytaster grandis Verrill	1

*Approx. $\frac{1}{3}$ of total haul only sorted.

Identification	Number in haul
Ophiuroidea	
Ophiomusium lymani Wyv. Thomson	>1000
Ophiacantha bidentata (Retzius)	89
Ophiura ljungmani Lyman	47
Amphilepsis ?ingolfiana Mortensen	1
Echinoidea	
Echinus elegans D & K	180
Holothuroidea	
? *Ypsilothuria* sp.	239
Paratrochostoma ?spiniferum Heding	1
? Holothuroidea sp.	2
Pisces*	
Cataetyx spp.	3
Chalinura spp.	6
Nematonurus armatus Hector	17
Synaphobranchus kaupi Johnson	5

Identification	Number in haul
Halosauridae sp.	1
Antimora rostrata Günther	8
Alepocephalidae sp.	1
Macrouridae sp. indet	1

* We are grateful to Dr J. Gordon for indentifying the fish.


Rockall
ROCKALL
BANK
1000
250
2000
ANTON DOHRN
SEAMOUNT
M
R
CHANNEL
100
250
Butt of Lewis
Wrath
St. Kilda
caesium samples
Trawls
Tiree
58
56
DEPTHS of isobaths in METRES
Malin
Head
RRS CHALLENGER
cruise · 1 | 1979
legs 1 and 2
ROCKALL
Benthic
Station
15°
10°W
Eagle
Is.
54°
3000

CHALLENGER CRUISE 1/79 (Leg 2)

Locality Hebridean Terrace 56° - 37°N. 09° - 12°W.

Scientific Staff.			
	J.D.M. Gordon	Chief Scientist	SMBA
	J.A.R. Duncan		SMBA
	S.M. McLean		SMBA
	D.L. Burkel		Glasgow Museum
	R. Nash		Millport.
	P. Schembri		Millport.
	I. Carstairs		Stirling Univ.
	A. Mathieson		Stirling Univ.
	A. Stewart		Stirling Univ.
	G. Johnston		Stirling Univ.

Aim To continue the seasonal study of the distribution and biology of deep sea demersal fish.

Weather Favourable on the 18th January but easterly gales prevented further work.

Narrative Challenger sailed from Dunstaffnage at 13.00 (17th Jan) and reached the first trawling position at 08.00 (18th Jan). The large Granton trawl was shot in a depth of 750 m at 08.26 and recovered at 12.04. An excellent mixed catch of fish was obtained. Challenger then steamed to the next trawling position and was hove to on station at 13.40. Shooting of the trawl was delayed until 'cats paws' on the starboard winch drum

were cleared and loose turns were removed from the port winch. The net was finally shot at 15.36 and recovered at 20.00. A large catch was obtained and by the time the trawl deck was cleared it was decided to postpone further trawling until next morning.

Challenger was on station at 08.00 (19th Jan) but during the night the wind had freshened and the swell precluded further trawling. An Agassiz net was shot at 08.50 and recovered at 11.22 with a good catch of fish and invertebrates. During recovery Challenger took several seas over the stern and it was decided to postpone any further work.

Challenger remained hove to until 11.00 hours (20th Jan) when in view of the weather forecasts and 45k winds, it was dedcided to move into the Minch. There were, however, no suitable trawling areas sheltered from the S.E. wind and Challenger proceeded to Dunstaffnage to land the scientific party at 10.30 (21 Jan), before steaming to Barry.

Results This cruise terminates the seasonal studies on the Hebridean Terrace which has always lacked material during the period November to March. It was fortunate that the 750 m and 1000 m trawls were completed since these were the only depths continuously sampled since 1975 and also are the depths which may be of importance should a commercial fishery become established.

The 750 m trawl was unusual in that there were larger numbers of the blue ling (Molva dypterygia) and Torsk (Brosme brosme) than are normally encountered at this depth. The remainder of the catch yielded good samples of Coryphaenoides rupestris,

Chimaera monstrosa, Deania calcea, Lepidion eques and Aphanopus carbo.

The 1000 m trawl was notable for the large catch of Alepocephalus bairdii. Good samples of other species were obtained but there were comparatively few young Coryphaenoides rupestris.

Acknowledgements It is a pleasure to record our gratitude to Captain Maw and his officers for their co-operation on this cruise. The expertise of Mr Dunning (Fishing Skipper) was much appreciated on this cruise and indeed, on all the cruises since 1975 which have led to a comprehensive coverage of the Hebridean Terrace.

John D.M. Gordon.

Challenger Cruise 1/79
(Leg 2)

Station No.	SMBA Trawl No.	Gear	Postion (approx).	Depth (m)	Date
1	38	Granton trawl	56°37'N 09°08'W to 56°35'N 09°11.6'W	750	18/1/79
2	39	Granton trawl	56°37'N 09°15'W to 56°28'N 09°17'W	1000	18/1/79
3	-	Agassiz trawl	56°41'N 09°13.56'W	1000	19/1/79