Scottish Marine Biological Association

Dunstaffnage Marine Research Laboratory.

RRS CHALLENGER

Cruise 3/1978

16-25 Feb.1978

1) Main objectives

a) To obtain an epibenthic sled sample of the abyssal macrobenthos of the SMBA permanent station (Fig. 2) on 54°40'N 12°16'W at 2900 m depth in order to continue a seasonal time series started in November 1975.

b) To test the MK II box corer at abyssal depths and to obtain a series of quantitative cores on the permanent station in order to continue studies of macrobenthic community structure.

c) To obtain hauls of the benthic megafauna using an Agassiz trawl in order to continue seasonality studies, especially on brittlestars.

d) To finish a partially completed box coring transect up the Hebridean slope in order to study bathyal zonation.

e) To attempt a box corer and Agassiz transect on the lower Rockall Trough/Porcupine Abyssal Plain.

2) Geographical area, cruise track, stations and gear worked.

See Fig. 1 and Table 1.

3) Scientific participation

1.	A.G.H. Connelly	SMBA
2.	Dr J.D. Gage	" Principal Scientist
3.	Dr P. Kingston	Dept. of Biological Sciences, Heriot Watt Univ.
4.	R.H. Lightfoot	SMBA
5.	Dr G. Oliver	Royal Scottish Museum
6.	Margaret Pearson	SMBA
7.	J. Price	IOS, Barry
8.	Patricia Wilkinson	SMBA

5) Cruise narrative

After a departure only slightly delayed, Challenger sailed at 1100 hrs on 16 February and steamed in excellent sea conditions around the N and NW coasts of Ireland for the SMBA permanent station. A freshening wind on 17 February generated an easterly swell resulting in progressively deteriorating sea conditions so that by 1530 hrs, when Challenger arrived on station, it was decided to launch the epibenthic sled rather than the box corer as planned. The sled was recovered at 1955 hrs with no sample and no evidence of the gear having bottomed. It was concluded that the ship was making too much way through the water (necessitated by the freshening wind) and that insufficient wire had been payed in order to compensate for this in order to bottom the gear. By this time sea and wind had increased, and because of the poor weather forecast it was decided to abandon further work and heave to until improvement occurred. During the night of 18 February the easterly wind reached force 9, easing to force 8 during the late morning on 19 Feb. Challenger remained hove to and during the afternoon and evening wind again reached 40-50 knots. The following day with no change in the weather Challenger steamed slowly for shelter along the Irish coast, anchoring in Blacksod Bay on Sunday afternoon. 20 Feb.

Challenger remained at anchor in snow storms the following day. With improvement in the weather Challenger heaved anchor at 0745 hrs on Tuesday 21 February and steamed for the permanent station in order to exploit a lull in the weather that was forecast. Sea conditions had by this time improved markedly,

with only an easy southerly groundswell and light to moderate southerly winds. The permanent station was reached at 1600 hrs and the box corer readied for a test drop in order to make best use of the good sea conditions. Although good pinger and tension records were obtained the gear was recovered closed but with no sample. Later study of these records, however, made it clear that although the gear had bottomed (probably during a trough in a sea) and released, insufficient slack wire was put out for an effective penetration of the sediment before the gear was yanked off the bottom again by a heave of the ship, and then winched in. The epibenthic sled was then put over at 1747 hrs in order to obtain the seasonal haul required. This time 6000 m of wire were payed out, with no pinger or weights on the wire, and with the ship making more than 3 knots ahead. With the winch stopped way was taken off the ship in order to allow the gear to sink. After allowing one hours' haul on the bottom, the sled was winched in and recovered on deck at 2239. Only a small well-washed sample was obtained despite apparently correct closure of the mouth gate, so another haul was commenced at 2315 hrs. 6000 m of wire were again payed out and the gear recovered at 0050 hrs the following day (22 Feb) recovering a satisfactory sample although the mouth gate was found not to have closed owing to a break in a soldered contact in the release mechanism. Although the sample was well washed, the presence of several large elasipod holothurians (sea cucumbers) appeared to have plugged the lumen of the bag and perhaps thus prevented any sample washing beyond them.

The Agassiz trawl was next put over for the deep haul required

from the permanent station. However, despite Mr Dunning's (the fishing skipper) efforts, the gear was eventually recovered at 0700 hrs with some midwater fauna in the net but no evidence of having been on the bottom. Because of steadily deteriorating weather and poor immediate weather reports Challenger abandoned further work and steamed towards Donegal Bay with the wind gusting more than 40 knots. After sheltering in the lee of the coast during the night of 22 February Challenger steamed for a position about 50 miles north of the permanent station in 2400 m depth in order to try and recover some benthic megafauna with the Agassiz before the ship had to steam for home. The station was reached at 1600 hrs on 23 February, and the Agassiz was put over on 6500 m of wire. After allowing for one hours haul on the bottom the net was winched at a fast rate, in excess of 100 m/min. Unfortunately, however, the rate was too fast for the new metering to count properly and the gear suddenly appeared and came up fast against the A-frame block with an indicated 948 metres still to come. The 3-ton shear-pin weak link snapped and one of the bridles lashed back and tore the net, releasing the sample into the water. No other damage was done, however, and after Mr Dunning repaired the net, it was put over for another haul. This time an adequate sample was recovered at 0045 hrs 24 February although the net was again badly ripped, possibly because of the previous damage.

Challenger then made course for Ardrossan where it had been previously agreed with RVB that the scientists (except for Mr Price) and their gear could be landed. Ardrossan was reached by 0700 hrs 25 February and Challenger berthed at 0800 for unloading, sailing again at 1000 hrs for Barry.

J.D. Gage
1 March 1978.

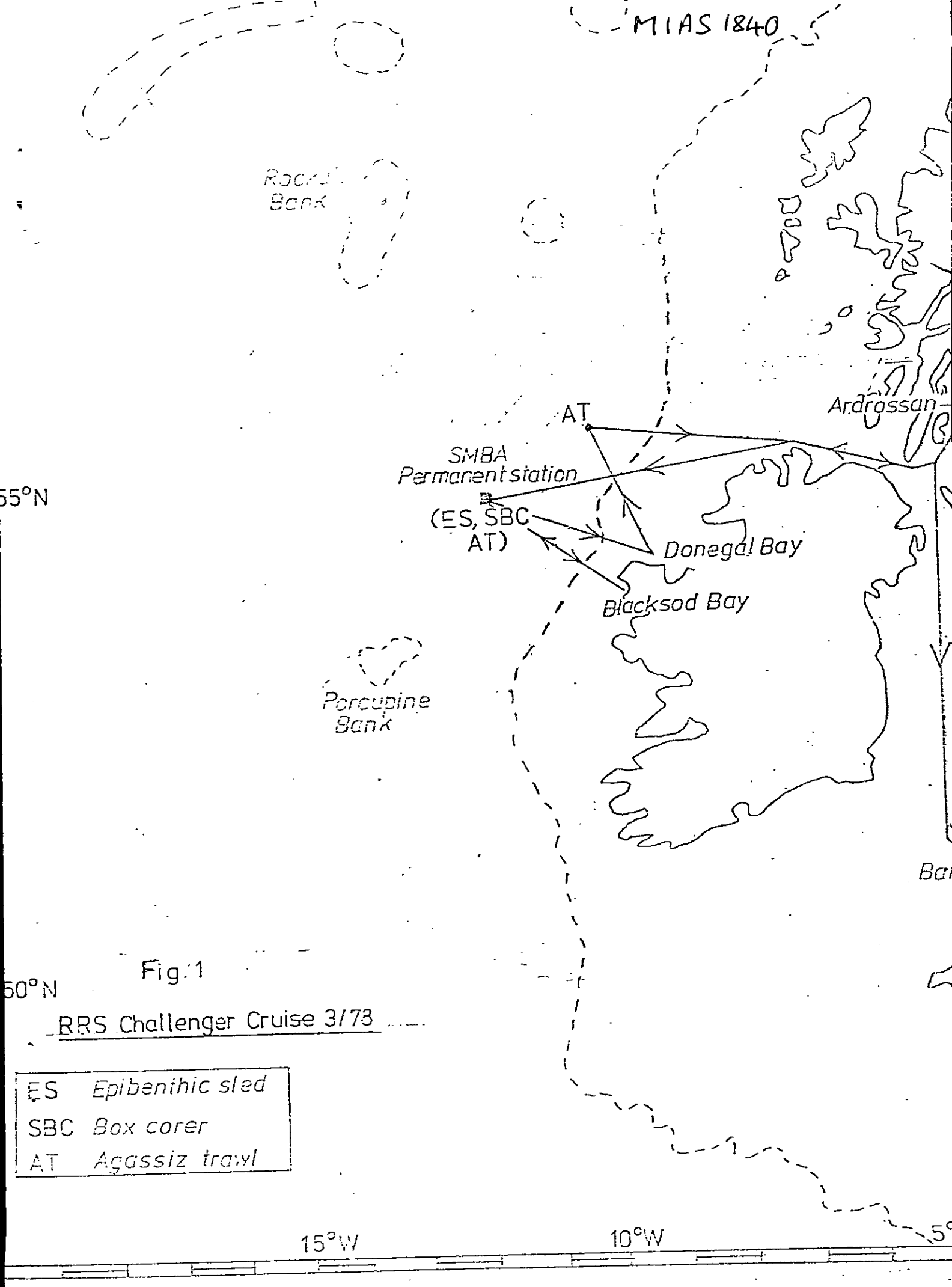

Fig. 1

RRS Challenger Cruise 3/78

Table 1 Station positions and gear worked (all depths given uncorrected)

Date	Operation No.	Approx. times gear on bottom (hrs GMT)	SMBA Stn. No.	Position on bottom	Depth (m)	Gear	Result
17 Feb	1	1700 - 1905	-	54°40.1'N,12°16.9'W	2910	ES (epibenthic sled)	No sample
21 Feb	2	1640	-	54°40.7'N,12°11.8'W	2905	SGC (spade box corer)	" "
21 Feb	3	2034 - 2155	136	54°29.4'N,12°15.9'W to 54°28.6'N,12°18.3'W	2915	ES	Small well-washed sample
22 Feb	4	0042 - 0245	137	54°33.7'N,12°19,5'W to 5 °36'N,12°19'W	ca 2900	ES	Good sample
22 Feb	5	0600 - 0635	-	54°46.8'N,12°20.3'W to 54°48'N,12°25'W	ca 2900	AT (Agassiz trawl)	Only pelagic elements in sampl
23 Feb	6	1830 - 1940	138	55°40'N,10°24'W	ca 2450	AT	Nearly all of sample* lost
23/24 Feb	7	2330 - 0008	139	55°35.0'N,10°24.6'W to 55°36.1'N, 10°26.3'W	ca 2450	AT	Small sample*

* See Table 2

Table 2 List of preliminary identifications of fauna in Agassiz hauls

Porifera

spp. indet.

Gorgonacea

Acanella arbuscula (Johnson)

Pennatulacea

Umbellula lindahli? Kolliker

Distichoptilum gracile Verrill

Madreporaria

Caryophyllia ambrosia Alcock

Flabellum alabastrum Mosely

Fungia cyathus marenzelleri Vaughan

Anthozoa

spp. indet.

Sipuncula

Sipunculus norvegicus Koren & Danielssen

Polychaeta

Leanira hystricis Ehlers

Terebellidae and Eunicidae spp. indet.

Crustacea Anomura

Neolithodes grimaldii Milne-Edwards & Bouvier

Gastropoda

sp. indet.

Scaphopoda

sp. indet.

Ophiuroidea

Ophiura ljungmani (Lyman)

Ophiomusium lymani Wyv. Thomson

Ophiocantha abyssicola? G.O. Sars.

Asteroidea

Zoroaster fulgens Wyv. Thomson

Bathybiaster vexillifer Wyv. Thomson

Pontaster tenuispinus (Düben & Koren)

Pseudarchaster parelii (Düben & Koren)

Echinoidea

Echinus elegans Düben & Koren

Holothuroidea

spp. indet. (fragmented after fixation)