

Scottish Marine Biological Association

Cruise Report

RRS Challenger

Cruise 13/1983

Duration of Cruise: 16th September (Dunstaffnage) to 2nd October (Plymouth)

Locality: Rockall Trough and Porcupine Sea Bight

Scientific Party:	J.D.M. Gordon	SMBA	Chief Scientist
	J.A.R. Duncan	"	
	S. McLean	"	
	N.R. Merrett	IOS	
	R. Russell	"	
	D. Edge	"	
	J. Nielsen	Zool. Museum Copenhagen	

Officers:	J. Moran	Captain
	P. MacDermott	First Officer
	J. Price	2nd Officer
	T. Boulton	3rd Officer
	F. Dunning	Fishing Skipper
	F. Hammond	Chief Engineer
	C. Harman	2nd Engineer
	C. Philips	3rd Engineer
	B. Entwistle	4th Engineer
	R. Morris	Catering Officer

Aims:

- (1) To sample the fish populations of the shelf/slope transition zone on the Hebridean Terrace using a Granton trawl.
- (2) To sample the fish populations of the slope of the Hebridean Terrace using the Marinovitch semi-balloon otter trawl.

- (3) To continue the seasonal survey of the Porcupine Sea Bight using the Granton trawl and the IOS semi balloon otter trawl.
- (4) To obtain samples of tissue from Hoplostethus atlanticus for electrophoretic studies.
- (5) To obtain blood samples from sharks and chimaeroids for electrophoretic studies.
- (6) To recover two IOS bathysnaps from the Porcupine Sea Bight.
- (7) To collect specimens for the Zoological Museum, Copenhagen.

Narrative (All times GMT)

Challenger sailed from Dunstaffnage (Oban) at 07.30 hrs (16/9) on passage to the area of slope to the west of the Outer Hebrides known as the Hebridean Terrace. At the time of departure the weather was fine and calm but by mid afternoon the wind had freshened and in view of the bad forecasts the master decided at 23.30 not to proceed beyond Barra Head but to seek shelter. By the morning of 17th Challenger was sheltering to the North of Coll and finally at 12.30 hrs dropped anchor in Tobermory Bay (Island of Mull). The wind continued to increase in strength and by 10.30 hrs (18/9) Challenger dragged anchor. Challenger then proceeded down the Sound of Mull to a new anchorage in Salen Bay where at 09.30 (19/9) the 3rd Engineer, whose father had taken ill, was landed by ship's boat. By 13.00 hrs the gales had moderated and Challenger proceeded up the Sound of Mull towards Barra Head which was rounded at 05.00 (20/9). Progress to the deep-water was slow because of the heavy swell and persistent strong winds. By 17.30 hrs sufficient depth had been obtained

to stream and tension the new 2000 m of main warp which had been supplied at Oban. Before hauling the spooling gear was checked and it was discovered that there were loose turns in the original wire on the winch barrel. A further 500 m of wire was paid out to clear these loose turns and then the warp was hauled onboard. This operation was completed at 19.42 hrs and the semi-balloon otter trawl (OTSB) was deployed at 19.57 over a sounding of 1500 m. Station 1 was complete by 00.40 hrs (21/9/83) with an excellent catch of 370 kg of fish. Challenger then steamed up the slope to a sounding of 1250 m where once again the OTSB net was deployed (Station 2) between 03.22 and 07.20.

Challenger then steamed up the slope to a sounding of 250 m and on passage the OTSB was removed and the Granton trawl assembled. This net was successfully fished at this sounding between 10.09 and 12.38 and again between 13.04 and 15.45. The Granton trawl was then dismantled and the OTSB re-rigged while Challenger steamed down the slope to a sounding of 1750 m. The net was shot at 23.55 (Station 5) and recovered onboard ~~and recovered onboard~~ at 04.48. Station 6 at 1000 m was fished between 07.30 and 10.45 and this was quickly followed by Station 7 at 750 m between 11.30 and 14.26 hrs. During the recovery of this trawl it was noted that the main warp was stranded at 2043 m. The next station (Station 8) was at 500 m and it was possible to fish it because only 1500 m of wire was required. The net was shot at 15.17 and recovered at 18.00 hrs (22/9). With steadily freshening winds from the south-east and a poor forecast the master decided that it would be best to abandon the 2000 m station and steam south to the Irish coast for shelter.

In the event the weather did not deteriorate as much as had been anticipated and on the morning of 23rd September Challenger altered course and headed direct to the IOS Bathysnap position at $51^{\circ}04'N$ $12^{\circ}55'W$ with the intention of repairing the main warp and deploying the OTSB net at a sounding of 1750 m on passage. By 17.30 on the 24th September the depth was sufficient to stream and stopper off the main warp. The damage was found to be due to a broken strand just inboard of the long splice between the old and new 13 mm sections. The repair was complete by 21.48 and at 22.15 Challenger was on station for the 1750 m OTSB (Station 9). The station was complete by 02.48 (25/9) and Challenger continued steaming towards the bathysnap position. Challenger located the mooring at 06.12 and had manoeuvred to a position above it by 06.49. Unfortunately, although the electronics indicated that the release had fired, the mooring failed to lift off the bottom. Challenger remained in position until 08.40 but further attempts to effect a lift off were unsuccessful. The next station (Station 10) was at 2500 m and the OTSB net was shot at 13.24 hrs but with just over 6000 m of wire out the winch driver noticed a loose end on the warp. It was decided to abandon this station and the net was recovered inboard at 17.00 without ever having taken the bottom.

Challenger then steamed towards the second bathysnap position at $49^{\circ}46'N$ $14^{\circ}02'W$ (4000 m) and on passage the main warp was paid out to effect a repair to the damaged portion of 6000 m. Closer examination of the damaged section revealed that in fact the damage was not a broken strand but a loose end of the long splice between

the 13 and 16 mm sections. It was decided not to attempt to renew the splice but an opportunity was taken to payout all the warp and retension it. This was complete by 05.14 (26/9) and at 06.35 Challenger was in position over the 4000 m bathysnap. This was successfully released and recovered onboard at 08.40.

At 09.52 the OTSB net was shot over a sounding of 4000 m (Station 11) and recovered successfully at 19.16. Challenger then steamed to a sounding of 3000 m (Station 12) and again the OTSB net was deployed between 21.23 and 04.37 (27/9). The final station in this area (Station 13) was worked between 07.04 and 12.35 at a sounding of 2500 m. Challenger then steamed towards the Goban spur to begin the final part of the programme and on passage all three trawl warps were streamed to remove turns.

Challenger arrived at the 1000 m station at 05.30 and the Granton trawl was assembled for shooting at daybreak. The trawl was shot at 06.12 and recovered onboard at 11.00 (Station 14). The Granton trawl was fished again (Station 15) between 13.03 and 17.33 over a sounding of 1200 m. During this haul power on the main engine was lost for 5 minutes and hauling began earlier than had been intended. Challenger then steamed to the 750 m sounding and hove to until 05.00 (29/9) when the Granton trawl was shot. When most of the warp was onboard it was found that the trawl boards had twisted round one another and when these were cleared there were also turns in the bridles of the net. These were eventually cleared by 10.30 and the net was shot once more at the same station (Station 16). The trawl was recovered onboard at 14.30 and Challenger

steamed to the 500 m contour where the Granton trawl was fished between 16.45 and 20.38 (Station 17).

The Granton trawl was then dismantled and the OTSB rigged while Challenger steamed to the 1000 m contour. The OTSB was shot at 22.36 and recovered onboard at 01.52 (Station 18). On completion of this station the master ordered a cessation of further work because of a poor weather forecast and Challenger began to steam eastwards towards Plymouth. By 06.00 the weather had still not deteriorated and it became obvious that there would be no change for about 12 hours. Challenger then steamed back to the 750 m sounding and fished the OTSB between 08.30 and 11.11 (Station 19). The OTSB was fished again at 500 m (Station 20) and 250 m (Station 21) between 11.58 and 14.07 and 15.29 and 17.19 respectively. During the last haul the weather began to deteriorate and Challenger began her passage to Plymouth entering Millbay docks on the afternoon of 2nd October.

Results

Rockall Trough - Hebridean Terrace

The two Granton trawls at a sounding of 250 m gave useful information on the fish fauna of the transition zone from shelf to slope. The most abundant species was the small gadoid Gadiculus argenteus thori followed by the blue mouth Helicolenus dactylopterus and the blue whiting Micromesistius poutassou.

In previous studies of the Hebridean Terrace (1975 to 1979) the fish populations of the slope were sampled by a Granton trawl, a prawn

trawl fished on a single warp and an Agassiz trawl. On this cruise the Marinovitch semi-balloon otter trawl, supplied by RVS, was fished at eight bathymetric zones between 500 and 1750 m. In common with the prawn trawl of previous cruises this net was poor at catching squaloid sharks, alepocephalids and scabbard fish. On the other hand the catches of the synaphobranchid eel, Synaphobranchus kaupi and to a lesser extent the notocanthid fish were far in excess of anything sampled by any of the other nets.

The total fish catch per unit area ranged from 3.3 to 11.9 kg/1000 m² which is approaching the values obtained for the Granton trawls and was considerably more than was obtained with the prawn trawl. It appears that the absence of the larger sharks and alepocephalids is compensated for by a greater efficiency at catching macrourids which is perhaps related to the higher headline height of the semi-balloon trawl.

Samples of liver, heart and white muscle, from Hoplostethus atlanticus were collected and stored in liquid nitrogen for electrophoretic studies in New Zealand where the species is commercially exploited.

All the invertebrates caught by the trawls were collected for Dr. Gage.

Porcupine Sea Bight

A total of 8 semi balloon otter trawl (OTSB 14) samples were taken in the Porcupine Sea Bight area over the mid-sounding range 247-3995 m. This gave an overall sampling time on the bottom of

11.6 hrs, during which the net was in contact with the sea-bed over 30 nautical miles. It yielded some 2700 fish weighing 417.5 kg. The maximum relative catch per unit area occurred over the range 696-2487 m soundings (1.2 - 1.8 kg/1000 m²). A total of 72 species were collected, varying as 10-21 per haul (mean 15 species/haul). The vertical distribution of species broadly conformed with previous results from the area. Unusual species encountered were the aphyonid Sciadonus sp and an interesting edentate macrourid specimen. In addition to the routine data collected, blood samples from sharks and chimaeras were collected for Salford University in connection with electrophoretic studies on the systematics of these groups.

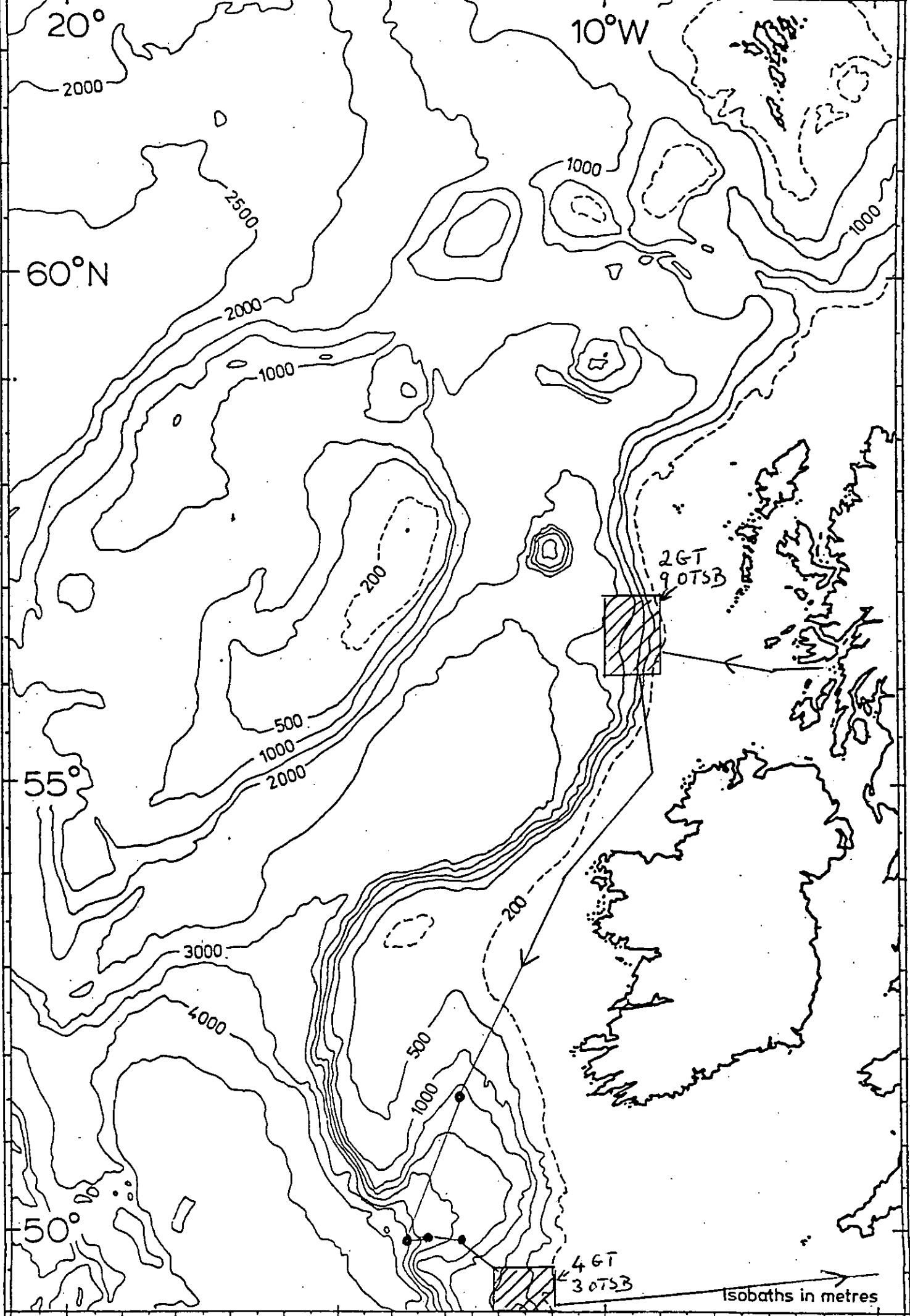
The aim of working a transect of Granton trawls between 250 and 1250 m on the Goban Spur was only partially successful. At the 1250 m station there was an accidental loss of power on the main engine which resulted in the net being hauled early and made the calculation of swept area inaccurate. At 750 m there were considerable problems with locked otter boards and twisted bridles. The long delay in recovering the gear onboard meant that there was insufficient time to complete the 250 m station before darkness and any hope of working it the following day was thwarted by the premature end of the cruise due to bad weather.

Acknowledgements

Despite the loss of time by bad weather at the start of the cruise and the problems caused by the kinking of main warp we were fortunate in achieving 6 Granton trawls and 15 semi-balloon trawls. We are grateful for the assistance given by the whole ship's company and especially to the fishing skipper, Mr. Dunning, without whose expertise considerably less would have been accomplished.

CHALLENGER CRUISE 13/83 STATION LIST

Station No.	SMBA Ref. No.	IOS Ref. No.	Gear	Date	Duration on bottom (mins.)	Position	Sounding m	Temperature °C	Distance run (N. miles)
1			OTSB14	20/9/83	60	56°39.3'N 09°37.5'W	1540-1550	4.5	2.3
2			OTSB14	21/9/83	70	56°41.1'N 09°14.5'W	1130-1265	-	2.7
3	75		Granton	21/9/83	49	56°35.7'N 09°01.5'W	220- 270	-	3.4
4	76		Granton	21/9/83	44	56°30.2'N 09°04.8'W	230- 380	-	3.0
5			OTSB	21/9/83	66	56°47.5'N 09°40.4'W	1775-1835	3.9	2.7
6			OTSB	22/9/83	57	56°32.4'N 09°17.4'W	980-1005	7.4	2.3
7			OTSB	22/9/83	51	56°24.6'N 09°10.5'W	750- 800	8.8-9.3	2.1
8			OTSB	22/9/83	59	56°23.4'N 09°07.5'W	500- 560	10.0	2.3
9		50801	OTSB	24/9/83	69	51°20.8'N 12°31.4'W	1700-1740	3.9-4.0	2.8
10		51802	OTSB	25/9/83	-	Approx. 50°37'N 13°29'W Station abandoned with 6000m wire out			
11		51803	OTSB	26/9/83	177	49°37.1'N 13°48.5'W	3990-3920	2.6-2.7	7.7
12		51804	OTSB	26/9/83	120	49°55.6'N 13°26.1'W	3180-3015	2.8-2.9	4.7
13		51805	OTSB	27/9/83	87	49°55.0'N 12°58.1'W	2430-2545	3.1-3.2	3.5
14	77	51806	Granton	28/9/83	91	49°28'N 11°50'W	1015- 990	-	5.7
15	78	51807	Granton	28/9/83	66	49°34.1'N 12°04.9'W	1190-1200	-	4.0
16	79	51808	Granton	29/9/83	90	49°29.7'N 11°35.2'W	745- 817	-	5.6
17	80	51809	Granton	29/9/83	90	49°25.8'N 11°27.1'W	430- 550	-	-
18		51810	OTSB	29/9/83	65	49°32.7'N 11°53.1'W	1021-1011	8.9-8.6	2.5
19		51811	OTSB	30/9/83	57	49°34.4'N 11°33.0'W	707- 685	10.0-10.1	2.7
20		51812	OTSB	30/9/83	60	49°28.7'N 11°26.3'W	505- 550	10.7	2.8
21		51813	OTSB	30/9/83	60	49°24.2'N 11°16.4'W	255- 240	11.3-11.4	2.7



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