Scottish Marine Biological Association

Dunstaffnage Marine Research Laboratory

CRUISE REPORT

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DUNSTAFFNAGE MARINE LABORATORY

AND

SCOTTISH MARINE BIOLOGICAL ASSOCIATION

OBAN, ARGYLL, SCOTLAND

CRUISE REPORT

RRS CHALLENGER

Cruise 63/1990

4 - 30 March 1990

RRS Challenger, Cruise 63/1990 : Leg 1

Duration: 0900 h 4 March - 1045 h 8 March 1990

Locality: Rockall Trough

Staff:

J.D. Gage	Scottish Marine Biological Association
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Aims: To sample the benthos and benthopelagic fish of the Rockall Trough as part of a seasonal study of the biology of these deep-sea organisms.

Narrative: The severe gales which hit the southwest of the British Isles at the end of February delayed Challenger's arrival at Ardrossan for the scheduled departure date of 1 March. The scientific party eventually joined ship at 1200 h 3 March but owing to continuing bad weather the afternoon sailing was postponed until the following morning. A lull in the weather permitted sailing at 0900 h 4 March but with a delay in answering a Mayday followed by worsening weather conditions, Challenger was forced to seek shelter off the Antrim coast. Gale force winds continued through the night and the following day 5 March. An improvement by midday 6 March, and a better forecast, encouraged optimism and Challenger made course at 1500 h for deep water to stream and tension the new main wire. By the early hours of 7 March, the sea state had forced reduced speed and Challenger hove to the south of the Stanton Banks.

On receiving a forecast of further bad weather with westerly winds of up to force 9, the Master decided to run for the Firth of Lorne to await an improvement, and Challenger steamed comfortably NE in a following sea, passing Dubh Artach at 1300 h 7 March. Challenger sheltered in the Lynn of Morven overnight and with forecasts of continuing gales, all hope of salvaging even some fishing at the slope edge had to be abandoned and Challenger made for Dunstaffnage, berthing at the DML pontoon at 10.45 h 8 March.

Results: Adverse weather conditions prevented Challenger reaching deep-water and no scientific work was possible.

J.D. Gage

RRS Challenger, Cruise 63/1990 : Leg 2

Duration: 1030h 12 March - 0830h 18 March 1990
All times GMT.

Locality: Scottish continental shelf, Rockall Channel and Wyville-Thomson Ridge.

Staff:
D.J.Ellett
R. Bowers
Dr. J.M. Graham
C.R. Griffiths
N. MacDougall

Aims:

1) To collect large volume water samples and CTD profiles at standard positions between the Sound of Mull and the Shelf-edge.

2) To service the DML current meter mooring in the Tiree Passage.

3) To work the CTD stations of the Anton Dohrn Seamount section between the Shelf-edge and Rockall.

4) To deploy a current meter mooring to the west of the Wyville-Thomson Ridge.

5) To work CTD sections in the region between Faroe Bank and the Wyville-Thomson Ridge.

Narrative: Strong westerly gales on 10 and 11 March caused the postponement of sailing from Dunstaffnage until 1030h 12 March. In improving conditions the ship proceeded to the first CTD and water-sampling station in the Sound of Mull, which was completed at 1520h. The Tiree Passage current meter mooring was grappled at 1810h and was successfully recovered by 1823h. After running new wires onto the winches the mooring was redeployed between 1928 and 1937h and CTD work was recommenced at 2040h. The southwesterly wind increased to force 8 during the evening and at the fifth water-sampling station at 0218 13 March work had to be abandoned because of difficulty in keeping the ship to the wire.

The southeast winds continued during 13 March at forces 8-9 and became southerly force 9 on 14 March, during which time the ship sheltered in the Sound of Mull and Lynn of Morven. With more hopeful forecasts for the Faroe region and a slight local improvement at 0600h 15 March it was decided that the first priority was to sample the Mull to shelf-edge stations at the surface if subsurface work was impossible, and CHALLENGER steamed for Barra Head. The southerly winds increased again to forces 8-9 during the evening, making it difficult to steer a suitable course for the station positions west

of the Hebrides, but the surface radiocaesium sampling was completed at the shelf-edge at 0250h 16 March. With the aim of obtaining winter salinity samples over the deep water the ship continued on a westward course until 0600h, when it was decided to run northwards to the planned mooring site. During the day conditions improved marginally, but when the mooring position south of Faroe Bank was reached at 0830h 17 March southerly winds of forces 8-9 had returned with a heavy swell. CHALLENGER was hove-to, but the morning forecasts promised no improvement and at 1300h it was decided to head for Torshavn at reduced speed.

Torshavn harbour was reached on the following morning, 18 March, and the ship was alongside at 0830h. Departing staff left to return to the UK at 0830h 19 March.

Results:

Aim 1) Large volume samples for radiocaesium analysis were collected at the surface at all ten standard stations between the Sound of Mull and the shelf-edge. Mid-water and bottom samples were obtained at the easternmost four stations, and CTD profiles at the first five, before the weather stopped further sub-surface work.

Aim 2) The current meter mooring in the Tiree Passage was serviced on 12 March. The two current meters appeared to have functioned correctly since the previous service on 20 November 1989.

Aim 3) No CTD profiles were obtained on the Anton Dohrn Seamount section due to weather. Surface salinity samples were collected for comparison with the data series from earlier years.

Aim 4) Weather also prevented the deployment of a current meter mooring to the west of the Wyville-Thomson Ridge. It is hoped to deploy this in late June.

Aim 5) No CTD work was possible in the Faroe Bank - Wyville-Thomson Ridge area.

General remarks: Apart from the first day of the cruise, the weather was uniformly bad with the unbroken passage of depressions across the area. Captain Maw and his officers made good use of the brief opportunities we had for working, and this enabled us to satisfy the major requirements of our commisioned work and to service our current meter mooring.

D.J. Ellett

RRS Challenger, Cruise 63/1990 : Leg 3

Duration: 1400 h 19 March - 0930 h 30 March 1990

Locality: Faroe/Shetland Channel

Staff:

J.D.M. Gordon	Dunstaffnage Marine Laboratory
C.R. Griffiths	" " "
O.A. Bergstad	" " "
M. Koie	Marine Biological Laboratory, Helsingor, Denmark
J.A. Sneli	Trondheim Biological Station, Trondheim, Norway
O.E. Tendal	Zoological Museum, Copenhagen, Denmark
A.B. Klitgaard	" " " "
E.I. Romer	" " " "
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A.C. Utne	" " " " " "
J. Reinert	Fisheries Laboratory of the Faroes
J.P. Johannessen	" " " " "

Aims

Aim 1) To sample the benthopelagic fish populations of the slopes of the Faroe/Shetland Channel.

Aim 2) To collect deep-water benthos as part of the BIOFAR programme.

Aim 3) To collect fish parasites.

Aim 4) To carry out a CTD transect across the Faroe/Shetland Channel.

Narrative: The scientific party joined ship during the morning of 19 March in Torshavn. Challenger sailed at 1400 h and headed for deep-water north of the Faroes to tension the main warp and begin the fishing programme. Forecasts of force 9 gales forced us to seek shelter to the east of Videro and there we remained until 0745 h 21 March when taking advantage of the eye of the depression we sailed for a position east of the Faroes to collect grab samples for a Swedish Institute. The first haul with the Smith-MacIntyre grab was successful, although part of the top cover was missing on recovery. While repairs were being effected, two water bottle casts were made to provide water from depths greater than 100 m for RVS. A further 5 hauls with the grab were unsuccessful, probably because of the heavy swell. The station was abandoned at 1645 h and with increasing winds Challenger once again headed for shelter off Videro arriving at 2230 h. By midday 22 March it appeared that a weather window of about 12 hours might open up on the following day and it was decided to postpone the tensioning of the main warp and rig the trawl to be fished on the port and starboard trawl warps. This was done in the afternoon and the fish were launched and tested out, by the evening all hope of a respite from the gales had receded and Challenger remained at shelter. Later that evening the wind veered to the north and Challenger steamed to the east of the islands

for shelter. Challenger remained at shelter all day Saturday 24 March in the company of upwards of 16 fishing vessels. By 1120 h 25 March the gales had begun to moderate and with an improvement to force 5 imminent, Challenger steamed towards the Faroe-Shetland Channel to occupy a 500 m station on the Faroese slope. The Marinovitch semi-balloon trawl (OTSB) was deployed at 1745 h and recovered at 2040 h. Unfortunately, the ground rope had parted on rough ground and the trawl was badly torn with only a small catch of invertebrates sticking to the meshes. The CTD was then deployed between 2111 h and 2159 h and then Challenger steamed to a 1000 m station where the OTSB was again deployed between 2300 h and 0227 h 26 March. During recovery a shackle and split link jammed in the inboard block of the stern gantry and the link parted. The trawl was recovered with some difficulty on one warp but nevertheless a good catch. The CTD was deployed between 0251 h and 0352 h.

The main scientific interest was in deep samples and it was decided to steam to 1500 m in the Faroe/Shetland Channel and trawl along the axis of the Trough. 1500 m is the maximum depth that can be fished on the paired trawl warps. Challenger was on station at 0815 h and the trawl was shot at 0830 h and recovered successfully at 1235 h 26 March. While the catch was being sorted, the CTD was deployed. Challenger then proceeded to a 1250 m station but on arrival at 1700 h the wind and swell had increased considerably and with the return of force 8 to 9 conditions, it was impossible to continue trawling. Instead, CTD stations up the slope at depths 1205, 990 and 755 m were worked between 1806 and 2353 h. Challenger then hove to hoping for a moderation in the weather but by 0730 h 27 March no improvement was forecast and Challenger steamed slowly for shelter to the east of the Faroe Islands.

Challenger tied up alongside in Torshavn at 0700 h 28 March and disembarked the Scandinavian scientists and their equipment. Challenger sailed from Torshavn at 1000 h, headed for Dundee. It was the intention to stream the main warp while crossing the deep-water of the Faroe/Shetland Channel but inevitably a gale blew up and at the appropriate time Challenger was hove to force 10 conditions. Challenger picked up the Tay pilot at 0800 h 30 March and tied up alongside Dundee at 0930 h. The scientific equipment was offloaded on the morning of 31 March.

Results:

Aim 1) A total of 139 specimens belonging to at least 12 different species were collected from the 1000 m station. The dominant species by weight were skates and Greenland halibut, but the most abundant were the zoarcids, liparids and a deep-water rockling. Some specimens were used for parasitological studies (see below) and stomach contents were collected from the Greenland halibut for the Faroese Fisheries Laboratory. Otoliths were collected from the Greenland halibut for ageing studies.

The 1500 m station yielded 87 specimens of at least 10 species. Skates once gained dominated the biomass and zoarcids and liparids were the most abundant.

With the exception of those kept for parasitological studies the entire collection was preserved for more detailed studies at the Dunstaffnage Marine Laboratory.

Aim 2) BIOFAR (Biology of the Faroe Islands) is a Nordic project with the aim of studying the benthic biology of the Faroe Islands and the adjacent waters. It began in 1987 and is funded by the Nordic Board of Ministers, the Calsberg Foundation, Faroese Banks and numerous Faroese businesses.

The principal objectives in taking part in the cruise of RRS Challenger -

(a) To collect the invertebrates sampled by the otter trawls (previous sampling was restricted to gears designed to catch smaller invertebrates).

There were only two successful trawl hauls at 1000 and 1500 m. The 1000 m trawl resulted in a good catch of pennatulids (Umbellula sp.), actinians, octocorals, mysids (Boreomysis sp.), large amphipods, decapods (Bythocaris sp.), pycnogonids (several Colossendeis sp. and other), echinoderms (Ophiomusium sp.), Pontaster cf., tenuispinus, bathybiaster vexillifer and large prosobranchs.

The 1500 m haul gave a similar catch dominated by mysids (Boreomysis scyphops), Bythocaris spp. and Hymenodora sp.) and the asteroids Pontaster tenuispinus and Bathybiaster vexillifer. In addition , the sample contained a few Umbellula sp., some actinians and a few large cephalopods.

(b) To supplement the trawl hauls by using either the epibenthic sledge, detritus sledge of triangular dredge along the same track. This could not be accomplished because the new main warp had not been tensioned.

(c) To obtain sediment samples for a bioassay experiment (comparing qualities of sediments from Kattegat, German Bight and the Faroes). Only one successful sample was obtained with the Smith-McIntyre grab. The other five attempts are unsuccessful because of the heavy swell.

Aim 3) Metazoan parasites of 34 species of teleosts from shallow water down to depths of 545 m have already been examined. This cruise gave an opportunity to collect fish from greater depths off the Faroes. Specimens of most species, mainly of the families Liparidae and Zoarcidae were fixed or frozen for later identification at the Marine Laboratory, Helsingor. So far nearly 50 species of parasite new to the Faroes have been described including at least one new species of nematode. The results, including a host parasite list are expected to be published later this year.

Aim 4) The original intention had been to work a CTD line across the Faroe/Shetland Channel on the passage leg from Torshavn to Dundee. As some hydrographic measurements had been made at each of the trawl sites, it was decided that the streaming of the main wire while crossing the deep water would be more beneficial. The weather conditions however, made such a decision academic. Surface samples for salinity were taken at regular intervals on the passage across the channel until we hove to. Sampling was not resumed again because of a fracture in the non-toxic pipework in the engine room.

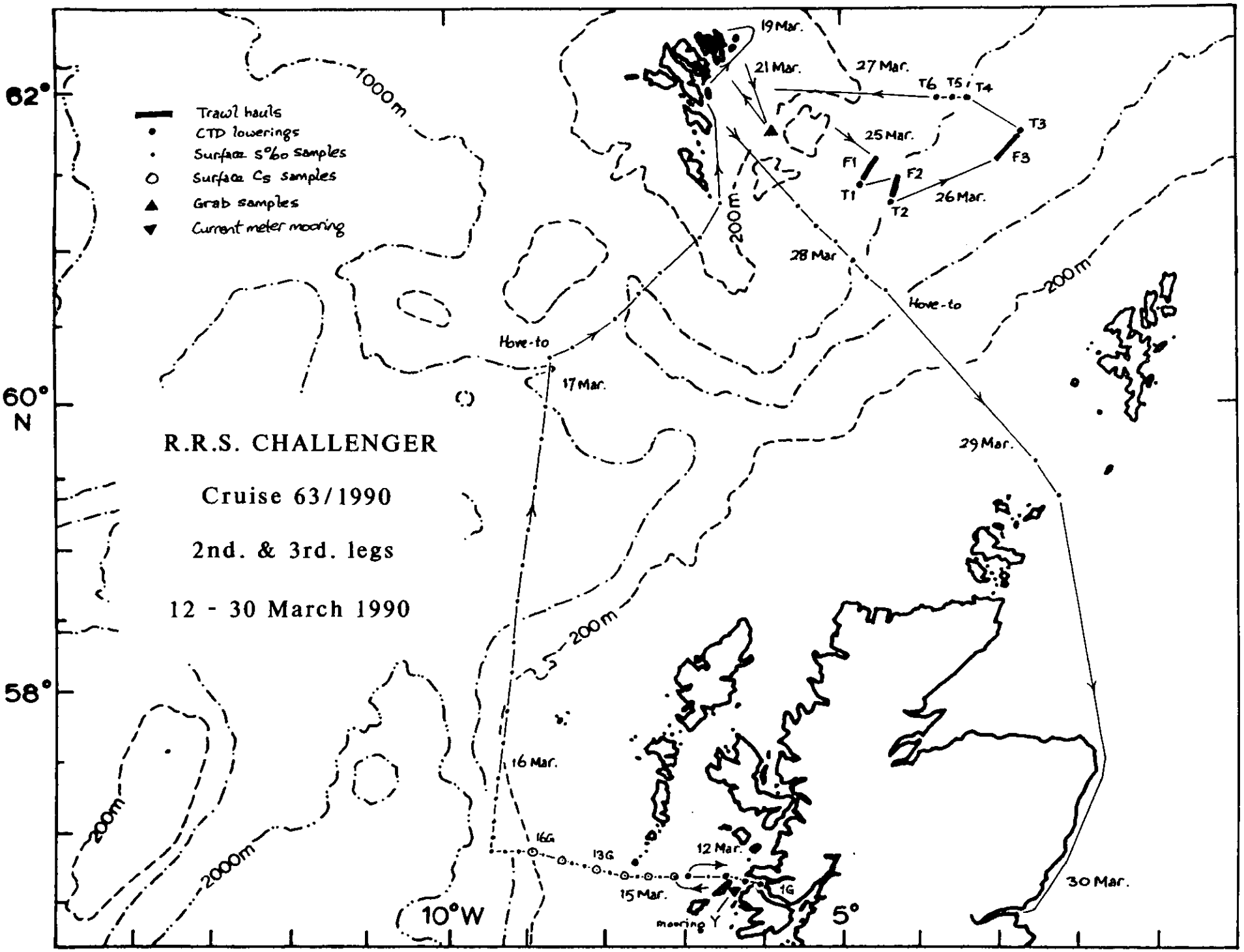
J.D.M. Gordon

Table 1. CTD and water sample data collected during Cruise 63

Stations	CTD disc/ dip nos.	Location	Dates 1990	Observations
1G - 16 G	148/001 - 005	Sd. of Mull - Shelf-edge	12-13, 15-16 Mar.	Surface S‰; Cs surface 1, 2, 4, 6, 7, 9, 11, 13, 15, 16. Cs sub-surface 1, 2, 4, 6, 7. CTD 1, 2, 4, 6, 7.
-	-	Rockall Channel - Faroes	16-18 March	Surface S‰ at 24 positions en route.
T1	148/006 - 007	61 27.4 N, 4 42.9 W	25 Mar	CTD
T2	148/008	61 18.4 N, 4 21.3 W	26 Mar	CTD
T3	149/009	61 46.0 N, 2 40.1 W	26 Mar	CTD
T4	149/010	61 58.1 N, 3 21.4 W	26 Mar	CTD
T5	149/011	61 57.0 N, 3 33.1 W	26 Mar	CTD
T6	150/012	61 57.4 N, 3 48.6 W	26 Mar	CTD
-	-	SE Faroe - Fair Is.	28-29 Mar	Surface S‰ at 8 positions en route.

Table 2. RRS Challenger Cruise 63 Leg 3 Fishing Station Data

Station No.	BIOFAR No.	Date	Time		Position (Start)				Course	Depth (m)			Mean Speed	Remarks
			Start	Finish	°N		°W		°	Min	Max	Mean	(knots)	
63/90/1	560	25/3/90	1855	1955	61	31.7	04	39.01	225-205	475	525	500	2.6	Trawl damaged, no catch.
63/90/2	561	25/3/90	2356	0100	61	23.47	04	25.03	200	1050	1075	1060	2.4	Good catch
63/90/3	562	26/3/90	0939	1116	61	40.14	02	54.05	035	1500	1580	1520	2.4	Good catch


Trawl hauls
CTD lowerings
Surface δ18O samples
Surface Cs samples
Grab samples
Current meter mooring
R.R.S. CHALLENGER
Cruise 63/1990
2nd. & 3rd. legs
12 - 30 March 1990
62°
60° N
58°
10°W
5°
1000m
200m
2000m
19 Mar.
21 Mar.
27 Mar.
T6
T5
T4
T3
25 Mar.
F1
F2
F3
T1
T2
26 Mar.
28 Mar
Hove-to
17 Mar.
29 Mar.
16 Mar.
16G
13G
12 Mar.
15 Mar.
1G
mooring Y
30 Mar.