Scottish Marine Biological Association

Dunstaffnage Marine Research Laboratory

Cruise Report

R.R.S. CHALLENGER

Cruise 9A/B 1980

24 May to 6 June 1980

RRS CHALLENGER, Cruise 9/1980. Leg. A

Duration of Cruise: 24 - 31 May, 1980.

Locality: Rockall Trough.

Participants: Dr. J. D. Gage (S.M.B.A.)

Dr. M. Dyer (Luton College of Higher Education)

Mrs. M. Pearson (S.M.B.A.)

Miss C. Payne (Royal Scottish Museum)

Miss S. Lancaster (University College of Swansea)

Aims:

1) To obtain samples of abyssal macrobenthos with the epibenthic sled at the S.M.B.A. permanent station on $54^{o}40'N$ $12^{o}16'W$ at 2900 m. depth in order to continue the sample time series.

2) To obtain samples of deep plankton.

3) To obtain samples using both the Agassiz trawl and epibenthic sled at S.M.B.A. hydrographic station "M" on $57^{o}18'N$ $10^{o}23'W$ in order to continue a secondary time series of samples of abyssal megabenthos.

4) To test a new 0.25 m^2 box corer for R.V.S.

Narrative: (All times B.S.T.)

Challenger sailed on schedule at 1400 hrs., 25 May leaving Ardrossan in excellent weather. Passage was made via Malin Head to the S.M.B.A. permanent station in the southern Rockall Trough, arriving on station at 2310 hrs., 26 May. After launch of the PES fish the epibenthic sled was deployed towing south-west and recovering a large sample at 1421 hrs., 27 May. The benthic haul was immediately followed by a deep plankton cast using the small rectangular midwater trawl (RMT 1) rigged on to the RMT 1 + 8 combination bars. The net was recovered with a good catch at 0809 hrs. The opportunity was then taken to test the new Barry box corer in the prevailing good sea conditions. The heavy corer was put over at 1851 hrs. bottoming being recorded with a marked drop in wire tension at 1835 hrs. The corer was recovered on deck at 1025 hrs. having released and closed correctly and with a good sample of bottom ooze, although one of the venting flaps had not closed and the water over the core was leaking badly through the sides and around the bottom of the sample box.

After this promising trial, Challenger steamed north in an increasingly heavy northerly sea for the vicinity of S.M.B.A. hydrographic station "M" for further bottom trawling. The steaming speed was reduced by what on investigation by divers at the end of leg 1 turned out to be a rope-fouled propeller, and station was not reached before 1100 hrs., 28 May. The large 10-foot RVS Agassiz was then deployed for the seasonal haul required in order to continue the time series of hauls of deep sea megabenthos initiated in 1978. The trawl was found on recovery at 1420 hrs.

to have fouled a current meter mooring that on later investigation of copies of scientific log sheets stored on the ship was recorded as laid during Challenger's cruise during the previous month 7/80. Although the bottom meter, followed by the three midwater meters, were recovered reasonably intact, the subsurface buoy, acoustic release and chain anchor were lost, probably during winching in. The subsurface buoy may have been dragged too deep and imploded, since no sign of it was seen on the surface. The Agassiz was recovered undamaged with a small catch suggesting that the mooring components may have been dragged along for some distance.

The epibenthic sled was then deployed in order to obtain a sample of juvenile stages of megabenthos species under current study. The sled was recovered with a good sample at 2253 hrs. Because of an increasingly heavy northerly sea and winds up to force 7, Challenger hove to until early morning then steaming to a position south of station M in preparation for further trawling. The eight-foot M.B.A. Agassiz loaned by Dr. A. J. Southward was then put over towing northward in steadily improving weather and recovering an excellent sample at 1315 hrs. 29 May.

Challenger then steamed south-east arriving at 1930 hrs. on a position on on the slope east of the Hebridean Seamount in order to obtain an epibenthic sled sample at 1000 m. depth. After an approximately half-hour tow on the bottom a very large sample was obtained, conspicuously rich in brittlestars. The RMT 1, rigged as for the previous RMT tow, was next fished with a pinger to within 200 m. off the bottom recovering at 0100 hrs., 30 May.

It was decided to use the remaining time in hand to resume tests with the R.V.S. box corer and the corer was readied in preparation for the first drop in 1000 m. after breakfast. In four successive trials on this station in excellent sea conditions and with little or no wind, the corer was recovered having failed to close. No further time was available for any modifications to be made to the gear and at 1333 hrs. Challenger steamed for Dunstaffnage, making passage via Skerryvore and the Forth of Lorne and dropping anchor in Ardmucknish Bay at 0745 hrs., 31 May. After customs clearance staff were disembarked by launch together with light gear and effects.

Results:

Aim 1) A large rich sample was obtained from the 1-hour tow over the bottom that because of northerly surface drift was relatively short in track length over the bottom.

Aim 2) A good near-bottom plankton sample was obtained at the southerly permanent station, and a further sample obtained on the slope for comparison with it, for study by Dr. P. A. Tyler of the University College, Swansea.

Aim 3) Good samples were obtained from both Agassiz trawl and epibenthic sled in the vicinity of station M. Specimens from the Agassiz were later forwarded deep-frozen to the Radiobiological Laboratory at Lowestoft for analysis. A further sled haul was obtained on the Hebridean slope. The haul was

conspicuously rich in a species of brittlestar, as yet not positively identified but close to Ophiocten latens Koehler.

Aim 4) Although the initial test with the new box corer was promising, in further trials on the Continental slope the corer failed to trigger although the gear had definitely bottomed as evidenced by a distinct drop in tension on the wire. It was eventually surmised that either clearances on the central stem of the corer were insufficient for it to press easily through the frame gimbals and trigger the release or else the sediment was too hard for the box to penetrate far enough for triggering. It is considered that improvement of clearances, moving the locking bar cam release from the lower to the upper position, and addition of ballast to the central stem of the corer may improve its future operation.

Marine Physics Group

Dunstaffnage Marine Research Laboratory

Scottish Marine Biological Association

Cruise Report RRS Challenger Cruise 9B/80

Duration: 31st May 1980 to 6th June 1980: Dunstaffnage to Ardrossan.

Locality: Scottish Continental Shelf between Hebrides and Anton Dohrn seamount.

Staff: A. Edwards, SMBA
Alison Ashcroft, Marine Biology Station, Portaferry
A.D. Banaszek, I.O.S., Bidston
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S.N. Smith, Dept. Naval Architecture and Ocean Engineering, University of Glasgow

Aims:

(1) To service the SMBA current meter mooring at station R ($57^{\circ}00'N.9^{\circ}00'W.$).

(2) To relay the SMBA current meter mooring at station M ($57^{\circ}17'N.\ 10^{\circ}21'W.$) following its accidental fouling in cruise 9A/80.

(3) To service an I.O.S. (Bidston) tide gauge at station N ($57^{\circ}14.407'N.\ 10^{\circ}03.882\ W.$)

(4) To measure temperature, salinity and dissolved oxygen at stations on the Scottish continental shelf.

(5) To measure-chlorophyll concentrations at stations on the continental shelf and in the surface water along the ship's track.

(6) To collect 50 litres water samples for radio-caesium analysis at standard stations on the shelf.

Narrative

Personnel arrived at Dunstaffnage pier at 0800 Z 31st May and were taken out to 'Challenger' by R.V. 'Seol Mara'. 'Challenger' was ready to leave at 1230 Z but was delayed until spare hose for generator cooling had been obtained in Oban and fitted. The ship sailed from Dunstaffnage at 1945 Z and started the line of standard radiocaesium sampling stations at 2318 Z off Ardmore Point. Minor difficulties with the Conductivity-Temperature-Depth instrument (CTD, Bissett-Berman type 9042) had been overcome before the beginning of station C4, and the CTD behaved well thereafter. Surface water samples were taken from the non-toxic supply at mid-points between CTD/radiocaesium stations.

Station R was reached on the evening of June 1st, and a mooring was laid there with 2 recording current meters (Aanderaa).

The previous current meter mooring at R was then recovered, after which the ship spent the night in a short line of CTD stations along the shelf edge. This line was stopped so as to reach station N at 0400 Z June 2nd and to start searching for the IOS tide gauge. The gauge was recovered two hours after being contacted and the ship then steamed to station M to relay a mooring of four Aanderaa recording current meters at depths of 100 , 500 , 1000 and 1750 m. The acoustic release which had been lost during the accidental fouling of the whole M mooring during cruise 9A/80 was then sought so as to prevent future confusion. It was found about 7 nm NE of the present position of the mooring 'M'.

After completing all required mooring work, 'Challenger' returned to the shelf to continue CTD profiling and to start collecting water

samples at various depths for chlorophyll and dissolved oxygen analysis. Line A was started at 1632 2nd June. Line B was successfully extended westward so as to detect a fall-off in surface water chlorophyll concentration over the shelf break similar to that which had been seen at the start of line A. Line Y ran along the shelf edge, and the scientific work of the cruise ended with completion of line J at 1911 4th June. The cruise ended in Ardrossan on 6th June.

The cruise track and the positions of the various stations are shown in figs. 1 and 2. Recording of sea surface temperature, conductivity and chlorophyll concentration was continuous between stations.

Results

The types of results from each station are tabulated in tables 1 and 2.

Table 1

Summary of Station Positions and Work 31/5/80 to 4/6/80

Cruise 9B/80

Time - GMT	-	Time of arrival at station according to Bridge Log.
Station	-	Names of Stations
Lat.	-	^{o}N.
Long.	-	^{o}W.
CTD	-	Whether or not used
Surface Salinity	-	By sample from non-toxic supply
Oxygen	-	Sampled by water cast usually at 5, 45, 80 m and bottom of CTD dip.
Chlorophyll	-	Sampled by water cast usually at 2, 20, 40, 70 m. One litre sample through GF/C filter.
Fluorometer	-	Whether or not used. Usually to 50 - 60 m depth.
Caesium	-	50 litre samples for caesium analysis.
Sounding	-	metres, from PDR (Precision Depth Recorder)
CTD Bottle Depth	-	metres, from 'wire out' measurement or by pinger and PDR *

CHALLENGER CRUISE 9B/80

	Time Z	Station	Lat. N.	Long. W.	CTD	Surface Salinity	Oxygen	Chlorophyll	Fluorometer	Caesium	Sounding	CTD Bottle Depth
	31/2318	C1	56°40'	6°07'	-	+	-	-	-	+	-	-
06	1/0000	C2	56°41'	6°17'	+	-	-	-	-	+	35	30
	1/0113	C3	56°44'	6°27'	-	+	-	-	-	+	-	-
	1/0151	C3½	56°44'	6°36'	-	+	-	-	-	-	-	-
	1/0235	C4	56°44'	6°45'	+	-	-	-	-	+	42	35
	1/0325	C4½	56°44'	6°53'	-	+	-	-	-	-	-	-
	1/0404	C5	56°44'	7°00'	+	+	-	-	-	+	142	130
	1/0515	C5½	56°44'	7°10'	-	+	-	-	-	-	-	-
	1/0600	C6	56°44'	7°20'	+	+	-	-	-	+	158	145
	1/0702	C6½	56°44'	7°30'	-	+	-	-	-	-	-	-
	1/0752	C7	56°44'	7°40'	+	+	-	-	-	+	65	40
	1/0930	C7½	56°46'	7°50'	-	+	-	-	-	+	-	-
	1/1020	C8	56°48'	8°00'	+	+	-	-	-	+	116	110
	1/1132	C8½	56°49'	8°10'	-	+	-	-	-	-	-	-
	1/1217	T	56°51'	8°20'	+	+	-	-	-	-	135	130
	1/1325	C9	56°53'	8°30'	+	+	-	-	-	+	129	126 *
	1/1434	C9½	56°55'	8°38'	-	+	-	-	-	-	-	-
	1/1525	S	56°57'	8°47'	+	+	-	-	-	-	126	120 *

Time Z	Station	Lat. N.	Long. W.	CTD	Surface Salinity	Oxygen	Chlorophyll	Fluorometer	Caesium	Sounding	CTD Bottle Depth
1/1654	R	57°00'	9°00'	+	+	-	-	-	+	131	129 *
1/2114	R1	57°07'	9°04'	+	+	-	-	-	-	137	130 *
1/2251	R2	57°14'	9°08'	+	+	-	-	-	-	150	146 *
2/1632	A1	57°25½'	9°12'	+	+	+	+	-	-	151	143 *
2/1923	A2	57°21'	8°54'	+	+	+	+	-	-	141	136 *
2/2126	A3	57°18'	8°37'	+	+	+	+	-	-	144	140
2/2327	A4	57°14'	8°20'	+	+	+	+	-	-	138	132 *
3/0144	A5	57°10'	8°03'	+	+	+	+	-	-	110	104 *
3/0334	A6	57°7'	7°49'	+	+	+	+	-	-	80	75
3/0554	A9	57°20'	7°35'	+	+	-	+	-	-	37	30
3/0729	B1	57°28'	7°40'	+	+	-	+	+	-	45	40
3/1002	B2	57°32'	7°58'	+	+	+	+	+	-	95	90
3/1210	B3	57°35'	8°15'	+	+	+	+	+	-	140	136 *
3/1418	B4	57°39'	8°33'	+	+	+	+	+	-	155	150
3/1640	B5	57°42'	8°50'	+	+	+	+	+	-	145	135
3/1846	B6	57°46'	9°08'	+	+	+	+	+	-	148	140
3/2051	B7	57°49'	9°21'	+	+	+	+	+	-	220	210

Time Z	Station	Lat. N.	Long. W.	CTD	Surface Salinity	Oxygen	Chlorophyll	Fluorometer	Caesium	Sounding	CTD Bottle Depth
4/0035	Y1	57°43'	9°13'	+	+	+	+	+	-	145	137 *
4/0236	Y2	57°50'	9°04'	+	+	+	+	+	-	147	137 *
4/0504	Y3	57°57'	8°55'	+	+	+	+	+	-	160	150
4/0654	Y4	58°04	8°46'	+	+	+	+	+	-	150	135
4/0837	Y5	58°10'	8°36'	+	+	+	+	+	-	148	135
4/1101	J3	58°22'	8°43'	+	+	+	+	+	-	290	264 *
4/1311	J4	58°15'	8°30'	+	+	+	+	+	-	160	145 *
4/1511	J5	58°09'	8°14'	+	+	+	+	+	-	134	125
4/1712	J6	58°03'	7°58'	+	+	+	+	+	-	100	90
4/1911	J7	57°57'	7°42'	+	-	+	+	+	-	95	90 *

Table 2

Mooring Work

Cruise 9B/80

Time	Station	Lat. N.	Long. W.	Decca 8E		
1747 1/6/80	R	56°59'	8°56.6'	C31.78	E70.32	1st Anchor laid in new shelf mooring.
				C31.38	E70.94	2nd Anchor laid.
1924	R	56°59'	8°59.36'	Recovery of old Shelf mooring completed.		
0556 2/6/80	IOS (B)	57°13.9'	10°03'	Tide Gauge recovered.		
1047 2/6/80	M	57°17.19'	10°20.82'	Deep current meter rig deployed.		
1258 2/6/80	-	57°22.3'	10°12.12'	Located release from station M which had been fouled in Cruise 9A/80.		

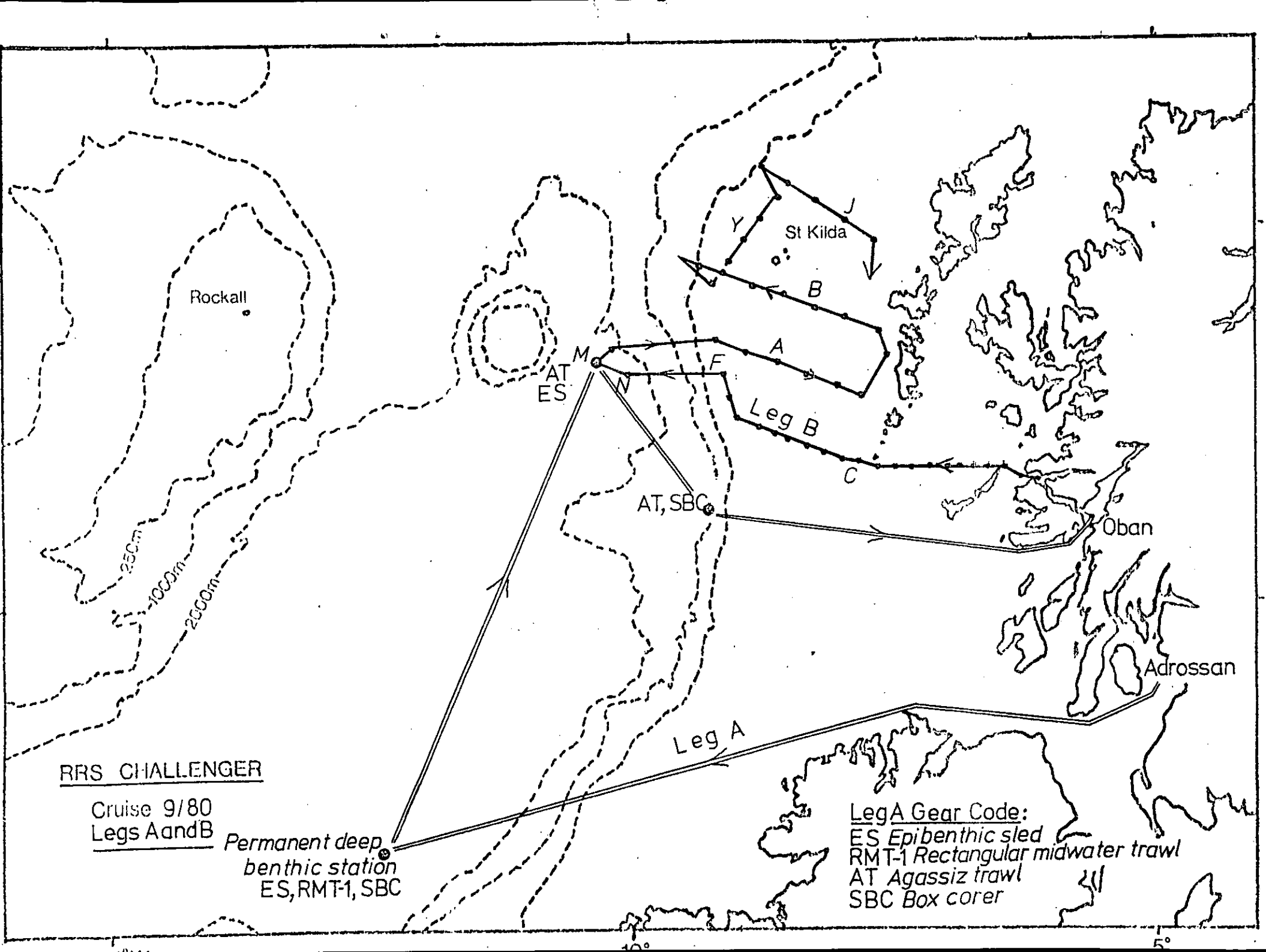
Rockall
250m
1000m
2000m
St Kilda
Y
J
B
A
F
M
N
AT
ES
Leg B
C
AT, SBC
Oban
58°
56°N
Adrossan
Leg A
RRS CHALLENGER
Cruise 9/80
Legs A and B
Permanent deep benthic station
ES, RMT-1, SBC
Leg A Gear Code:
ES Epibenthic sled
RMT-1 Rectangular midwater trawl
AT Agassiz trawl
SBC Box corer
10°
5°

Figure 1

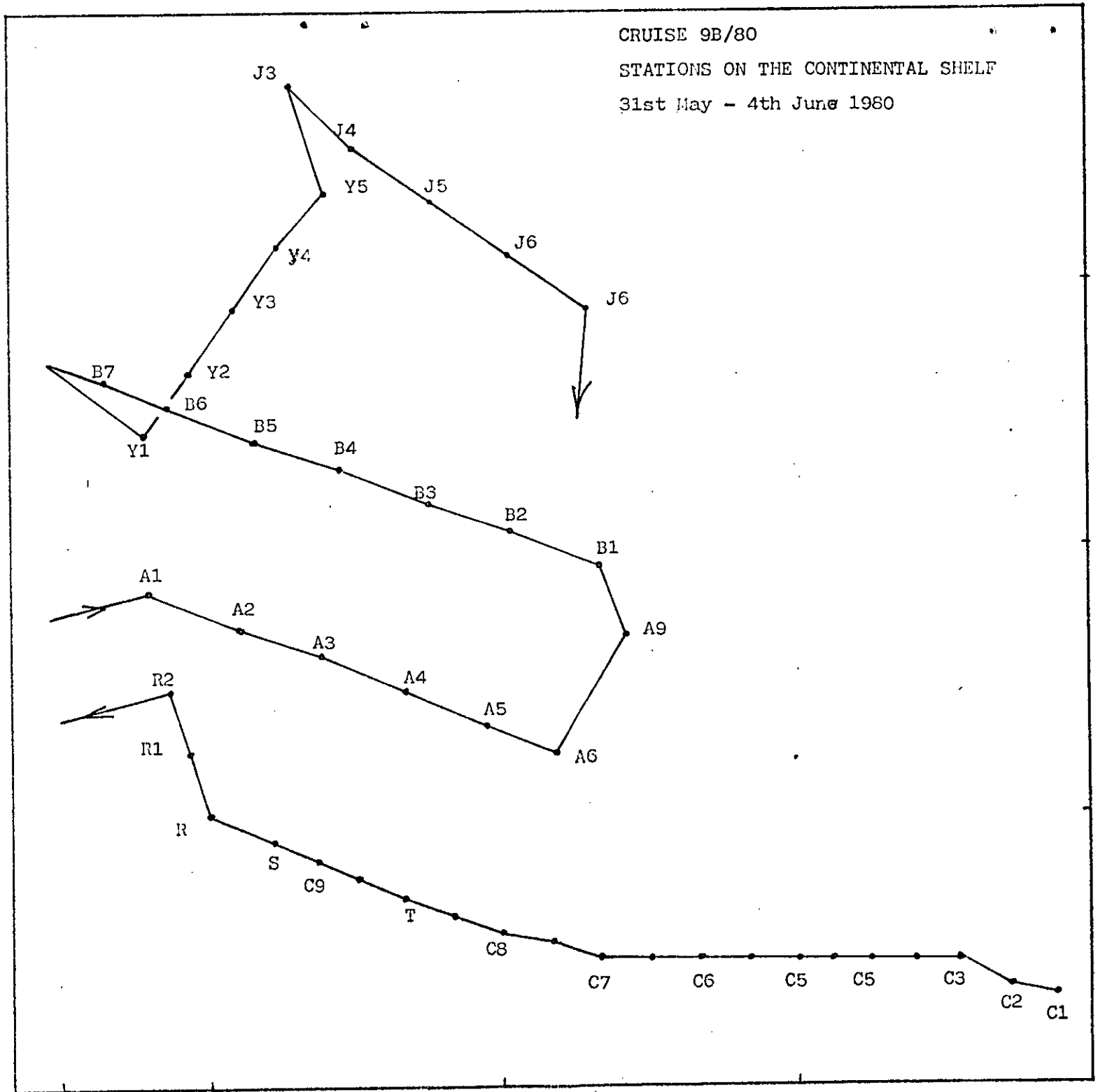
CRUISE 9B/80
STATIONS ON THE CONTINENTAL SHELF
31st May - 4th June 1980
58° 30' N.
58° 00' N.
57° 30' N.
57° 00' N.
56° 30' N.
J3
J4
J5
J6
J6
Y5
Y4
Y3
Y2
Y1
B7
B6
B5
B4
B3
B2
B1
A1
A2
A3
A4
A5
A6
A9
R2
R1
R
S
C9
T
C8
C7
C6
C5
C5
C3
C2
C1

Fig. 2