Scottish Marine Biological Association

Dunstaffnage Marine Research Laboratory

CRUISE REPORT

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Cruise Report

R.R.S. CHALLENGER

Challenger Cruise 4/1985

2 - 16 May 1985

R.R.S. CHALLENGER, Cruise 4/1985

Duration of cruise: 1612 h 2 May - 0817 h 16 May 1985.
All times GMT.

Locality: Scottish continental shelf, 55-59°N,
Rockall Channel, 57-58°N.

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Aims:

1) To make CTD transects across the shelf between the Mull of Galloway and the Butt of Lewis, and to collect radiocaesium samples for analysis by Glasgow University and the Fisheries Radiobiological Laboratory upon a selection of the transects.

2) To check the North Channel current meter moorings and take any necessary action.

3) To deploy an electromagnetic current meter at site S, off S.E. Islay, and recover the mooring at the end of the cruise.

4) To service mooring Y, in the Tiree Passage and recover Menai Bridge mooring M2.

5) To work the Anton Dohrn Seamount CTD section.

6) To repeat CTD stations worked in February in the Firth of Clyde and Kilbrannan Sound.

Narrative:

CHALLENGER sailed from Dunstaffnage at 1612 h 2 May in fine quiet weather, and section E across the Firth of Lornewas begun at 1926 h and completed at 2247 h. Overnight, section B across the southern Sound of Jura was worked, and upon completion at 0631 h 3 May the ship steamed to mooring S, off Port Ellen. The mooring was recovered at slack water, between 0836 and 0855 h, and tests were conducted of the Neil Brown

'Smart' CTD during the forenoon. The replacement mooring, carrying an S4 electromagnetic current meter was rigged and laid at the following slack water at 1612 to 1629 h.

The station grid in the Firth of Clyde, Lower Loch Fyne and Kilbrannan Sound was worked between 1017 h 3 May and 0503 h 5 May in continuing fine weather. Test lowerings of the Neil Brown CTD were made at a number of stations. The section between Portpatrick and Copeland was worked across the North Channel from 0614 h to 1210 h with large volume water sampling for radiocaesium. The six Lowestoft current meter moorings laid by r.v. CLIONE in the North Channel were visited and visually checked, after which section Y was worked between Corsewall Point and Sanda at 1711 to 2211 h. The section from the Mull of Kintyre to Antrim followed at 2257 h to 0340 h 6 May. CHALLENGER steamed via Rathlin Sound to begin work on a section between Lough Foyle and Islay at 0653 h, breaking off after C4 at 0952 h to proceed to mooring S.

The surface current meter deployed on 3 May was removed from the mooring by rubber boat and a replacement meter was attached, and between 1528 and 1747 h the section was completed. Loss of boiler pressure slowed the journey to the west coast of Islay, and section D was begun at 2153 h. After completing this section at 0611 h 7 May the ship proceeded to Menai Bridge mooring site M2 and two moorings were recovered between 1130 and 1310 h. The first station of the radiocaesium sampling section westward from the Sound of Mull was worked whilst awaiting slack water for mooring Y in the Tiree Passage, which was recovered and redeployed between 2000 and 2113 h. The section past Barra Head to the shelf edge was completed at 1635 h 8 May and work continued with the Anton Dohrn Seamount section throughout 9 May. Rockall was reached at 0003 h 10 May and the ship steamed eastwards, taking surface samples. Tank tests of the Neil Brown CTD on the sea cable were made en route to section BN on the St Kilda shelf. This section was worked between 1407 h 10 May and 0239 h 11 May. Section J, from Loch Resort to the shelf edge followed at 0818-1909 h.

The northernmost outer shelf section, M, was worked in continuing fine weather with excellent visibility between 0033 and 0951 h 12 May. After rounding the Butt of Lewis the sections from Broad Bay to Eddrachillis Bay and Gareloch to Loch Seaforth were worked during 1252 h 12 May and 0448 h 13 May. With the completion of the scheduled sections it was decided to work three additional transects, from Loch Dunvegan to

Loch Maddy, Loch Boisdale to Loch Bracadale and Loch Moidart and from Skerryvore to N.W. Islay. These were occupied between 0722 h 13 May and 1419 h 14 May, after which course was set for mooring S.

It had been planned to again replace the surface current meter by boat in order to provide another trial of the meter and mooring. However, after recovering the surface meter at 1754-1815 h it was apparent that the data was in error, and it was decided that overside wire tests would be more suitable. The watch buoy was taken in at 1829-1834 h and the main mooring between 1934 and 1954 h. After a CTD lowering, the two S4 current meters were lowered upon the hydrowire for tests, and upon completion the ship steamed to carry out seven CTD Stations in the Sound of Jura, between 2143 h 14 May and 0226 h 15 May.

CHALLENGER then steamed to the Firth of Lorne where the morning was spent testing both the current meters and the Neil Brown CTD. Between 1336 and 1722 h, stations 1-5E were repeated, using the Neil Brown instrument. CHALLENGER subsequently steamed north, to anchor off Kerrera at 2135 h. Gear and scientific staff left the ship at Oban North Pier after berthing at 0817 h 16 May.

Results:

Aim 1). A comprehensive set of CTD sections were worked across the Scottish shelf between the North Channel and 59°N. Details of all sections are given in Table 1. Radiocaesium samples were collected for the Lowestoft laboratory at two to three depths on the Sound of Mull to shelf-edge section, and for Glasgow University Chemistry Department on the two sections crossing the North Channel, and on sections east and west of Harris.

Aim 2). The five MAFF moorings deployed across the North Channel between County Down and Galloway by r.v. CLIONE in April were visually checked and appeared to be in good order.

Aim 3). The current meter mooring south of Islay, mooring S, carried a Bell acoustic current meter in the near-surface layer upon a compliant mooring attached to the sub-surface float of a normal U-shaped mooring. The acoustic current meter had been serviced by r.v. CALANUS on 16 March. This mooring was recovered on 3 May and replaced by a similar mooring in which an electromagnetic Interocean S4 current meter took the place of the acoustic meter. On 6 May the near-surface instrument was recovered by inflatable boat and replaced by an S4 meter upon a steel suspension bar. Upon recovery on 14 May it was found that

the data were suspect and the complete mooring, which included two Aanderaa current meters and a separate watch spar buoy, was brought in. Subsequent tests upon the hydrographic wire at stations in the Firth of Lorne showed that the steel bar had distorted the electromagnetic field, and it was decided to revert to the titanium suspension system for deployments in the North Sea.

Aim 4). Mooring Y, in the Tiree Passage, was recovered and redeployed on 7 May. The two Menai Bridge moorings off Dubh Artach had been successfully retrieved earlier on the same day.

Aim 5). The Anton Dohrn Seamount CTD section was completed in good weather between 1553 h 8 May and 0024 h 10 May. Surface salinity values appeared to have returned to the levels of the mid-1960's.

Aim 6). The grid of 31 stations in the outer Firth of Clyde, Kilbrannan Sound and Lower Loch Fyne was worked between 2020 h 3 May and 0403 h 5 May.

Miscellaneous. Extensive tests of the Neil Brown 'Smart' CTD were conducted during the cruise. These revealed a number of shortcomings which can be accurately described to the manufacturers in order that remedial work can be undertaken.

Table 2. Moorings serviced during Cruise 4/1985

Mooring	Institute	Depth m.	Lat. ° N '	Long. ° W '	Deployment dates	No. of current meters	Remarks
S	SMBA	56	55 33.6	6 04.9	16 Mar. - 3 May	3	U-shaped mooring, surface acoustic c/m.
S	SMBA	58	55 33.6	6 04.9	3 - 6 May	3	U-shaped mooring, surface electromagnetic c/m.
S	SMBA	58	55 33.6	6 04.9	6 - 14 May	3	U-shaped mooring, surface electromagnetic c/m.
Y	SMBA	38	56 36.8	6 24.5	28 Jan. - 7 May	1	U-shaped mooring, surface spar.
Y	SMBA	47	56 37.2	6 24.0	Redeployed 7 May	1	U-shaped mooring, surface spar.
M2(a)	MSL	71	56 12.2	6 48.9	11 Feb. - 7 May	4	U-shaped mooring, surface toroid.
M2(b)	MSL	68	56 12.4	6 49.0	11 Feb. - 7 May	2	U-shaped mooring, surface toroid.

MSL = Marine Science Laboratories, Univ. Coll. of N. Wales, Menai Bridge.

Table 1. Sections worked during Cruise 4/1985

Stations	Location	Dates	Observations
5E - 1E	Firth of Lorne	2 May	CTD
1E - 5E	Firth of Lorne	15 May	CTD (Neil Brown instrument
1B - 5B	Gigha - Islay	3 May	CTD
S	Mooring S	3, 14 May	CTD
FC1 - FC31	Firth of Clyde & Loch Fyne	3-5 May	CTD
6Z - 1Z	Portpatrick - Copeland	5 May	CTD; Surface Cs; Sub-surface Cs (2-5)
1Y - 5Y	Corsewall - Sanda	5 May	CTD
1A - 5A	Kintyre - Antrim	5-6 May	CTD; Surface Cs; Near-bottom Cs (2, 4).
1C - 7C	Lough Foyle - Loch Indaal	6 May	CTD
8D - 0D	West from Islay	6-7 May	CTD
1G - 16G	Sound of Mull - Shelf-edge	7-8 May	Surface S‰; CTD, surface & sub-surface Cs (1,2,4,6,7, 9,11,13,15,16)
T - A	Anton Dohrn Seamount section	8-10 May	CTD
BN9 - BN1	St Kilda shelf	10-11 May	CTD
1J - 8J	Loch Resort - shelf-edge	11 May	CTD, surface Cs; Sub-surface Cs (2, 5)
9M - 1M	NW from Butt of Lewis	12 May	CTD
6L - 1L	Broad Bay - Eddrachillis Bay	12 May	CTD
9K - 1K	Loch Gairloch - Loch Seaforth	12-13May	CTD; surface Cs (1-4,7,8) Sub-surface Cs (2)
1N - 6N	Loch Dunvegan - Loch Eport	13 May	CTD
H1 - H9	Loch Boisdale - Loch Moidart	13-14 May	CTD
I1 - I5	Canna - Loch Bracadale	13 May	CTD
P1 - P7	Skerryvore - Islay	14 May	CTD
B3,SJ1-SJ7	Sound of Jura	14-15 May	CTD

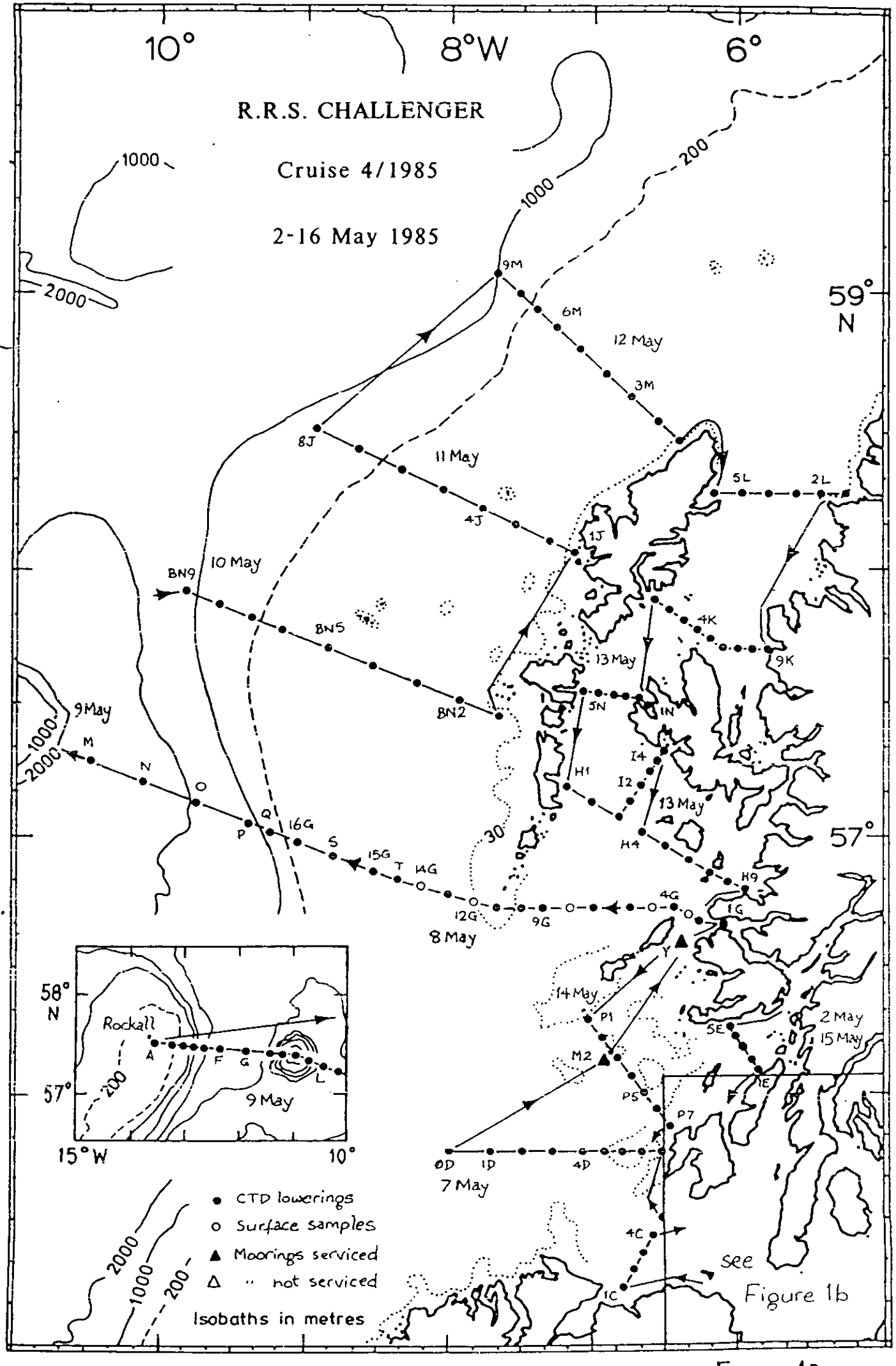
10°
8°W
6°
R.R.S. CHALLENGER
Cruise 4/1985
2-16 May 1985
59° N
57°
1000
2000
200
9M
6M
12 May
3M
8J
11 May
4J
1J
5L
2L
BN9
10 May
BN5
BN2
4K
9K
13 May
5N
1N
I4
H1
I2
13 May
H4
H9
4G
1G
9May
M
N
O
P
Q
16G
S
15G
T
14G
12G
9G
8 May
30
58° N
57°
Rockall
A
F
G
L
200
9 May
15° W
10°
Y
14 May
P1
M2
P5
P7
SE
2 May
15 May
1E
0D
1D
4D
7 May
4C
1C
see
Figure 1b
CTD lowerings
Surface samples
Moorings serviced
not serviced
Isobaths in metres
2000
1000
200

Figure 1a

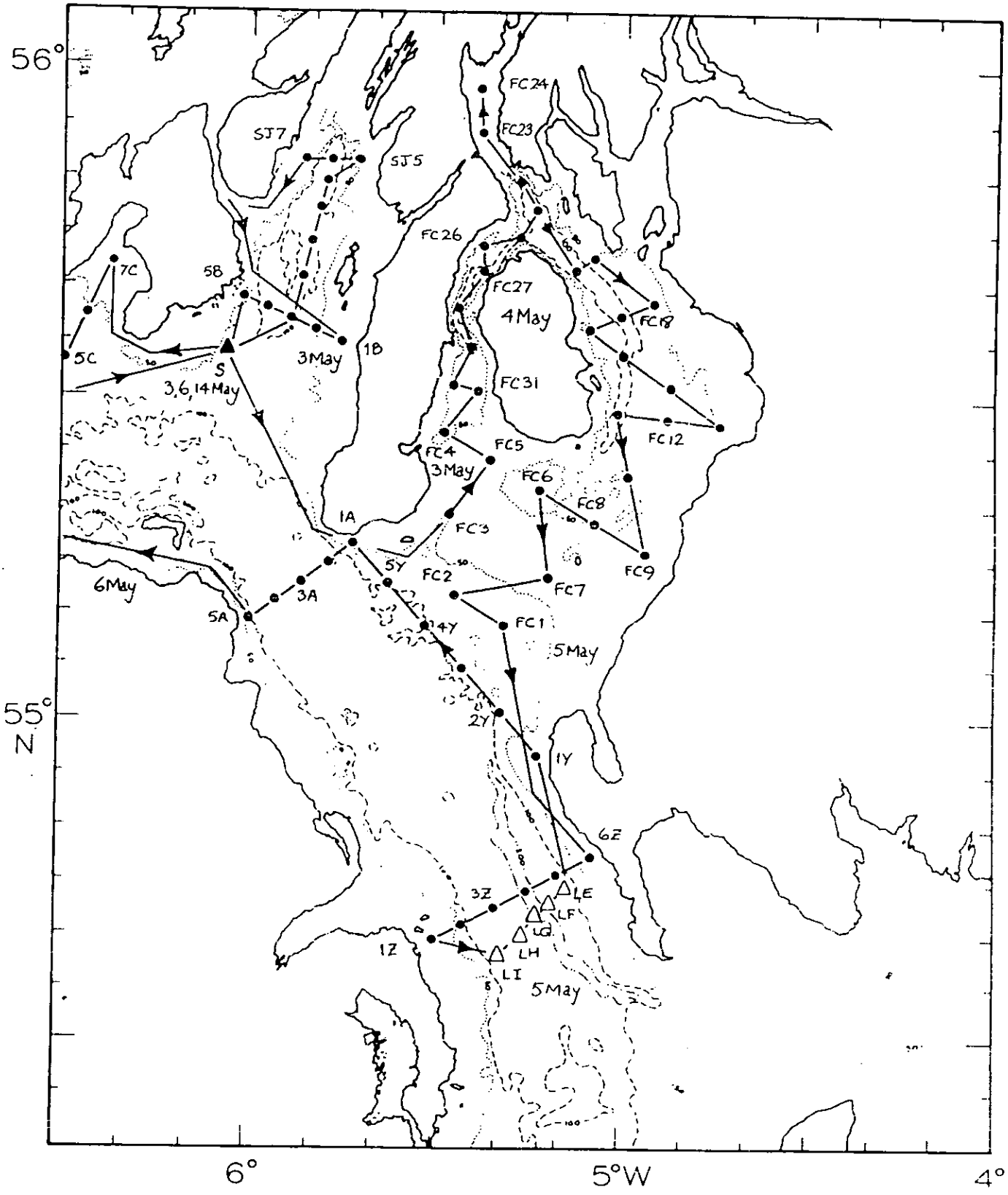
56°
55° N
6°
5°W
4°
SJ7
SJ5
FC24
FC23
FC26
FC27
4May
FC18
FC31
FC12
FC4
3May
FC5
FC6
FC8
FC3
FC2
FC7
FC9
FC1
5May
7C
5B
1B
5C
S
3,6,14May
3May
1A
5Y
6May
3A
5A
4Y
2Y
1Y
6Z
3Z
LE
LF
LG
LH
LI
1Z
5May

Figure 1b.