Acknowledged by card 22 Sep 78

SMBA Dunstaffnage Marine Research Laboratory

Preliminary Cruise Report: RRS CHALLENGER, Cruise 11B

(Note: A combined final report of JASIN cruises 11A to 11D will be issued subsequently)

Duration: 1306 h 29 July - 1320 h 12 August 1978

All times GMT

Locality: Rockall Channel

Staff: D.J. Ellett

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D. Rae (student)

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Prof. C.S. Ling (Catholic University of America)

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Miss E. Murphy (Univ. Coll. of Galway)

Aims:

1) To make an STD survey around the JASIN experimental area.
2) To service the SMBA shelf mooring in 57°N, 9°W.
3) To work the Anton Dohrn Seamount STD section.
4) To make water droplet flux measurements with Professor Ling's apparatus.

5) To make foam measurements by obtaining sets of oblique photographs (Miss Murphy).

6) To make surface chlorophyll measurements throughout the cruise.

7) To collect 50 litre surface water samples for radiocaesium analysis at standard positions on the Scottish continental shelf.

Narrative: CHALLENGER sailed from Stornoway at 1306 h 29 July in southerly force 6 winds which became light on the passage to the Butt of Lewis and remained so for the following eleven days. Course was set for the nearest point of the STD grid, station A1E, with underway chlorophyll measurements, surface temperature and salinity being logged en route, as throughout the cruise.

Station A1E was reached at 0815 h 30 July and an STD lowering made with the borrowed 9040 instrument. During the lowering contact was made with SHACKLETON working at A1N, and an intercomparison station was arranged at A1E which took place at 0945-1113 h. After discussions with Mr Crease aboard SHACKLETON, it was decided to begin CHALLENGER's circuit of the STD grid at triangle D5 at the north-west corner, as both SHACKLETON and TYDEMAN were currently in the south of the area. Course was set for station D5E, and on passage the 9040 STD was changed for the 9006 instrument, as the salinity trace given by the former had been of poor quality. A test lowering with the 9006 at 2030 h gave much better results and this instrument was used for all lowerings during the cruise.

Work on the STD grid began at 0157 h 31 July and continued in calm, overcast weather without major incident until its completion at triangle A4 at 0224 h 9 August. Two circuits of each of the sixteen triangles of the grid were made using the lowering speeds adopted on cruise 11A, viz: 0.5 m. sec^{-1} from surface to 120 m and approximately 1 m. sec^{-1} at greater depths.

Upon finishing the grid CHALLENGER steamed to Rockall to commence the Anton Dohrn Seamount section at 0758 h 9 August and completed station 0 by 1126 h 10 August. With a freshening southerly wind it was decided to proceed to station R in order to service mooring E1 before conditions worsened. The existing mooring was located at 1400 h and raised after laying its successor in the near vicinity, and at 1550 h the ship returned to station P to resume the section. Radiocaesium sampling began on the return to station R and continued in association with STD lowerings at stations eastward to the Sound of Mull, which was reached at 1315 h 11 August. During the passage across the shelf winds had increased to force 6 with attendant swell.

CHALLENGER proceeded to Glasgow via the Sounds of Mull and Islay, arriving at the Clydeport pilot station at 1100 h 12 August and berthed at Yorkhill Quay, Glasgow at 1320 h.

Results Aim 1) Because of the remarkably fine weather the STD grid of 96 stations was completed in almost exactly 9 days. In more normal weather it is probable that work would best be concentrated upon the central twelve triangles of the grid. Water-bottle calibration samples were obtained at all stations and 'first look' plots of calibrated data have been prepared. Temperature sections drawn from the mean values at triangles on the B and D lines are shown in Figures 1 and 2. Due to the intensive work and the fact that the ship sailed with two less scientific staff than had been expected, further analysis of the data has not yet been possible.

Aim 2) The shelf mooring in 57°N, 9°W (JASIN mooring E1) was recovered and re-laid on 10 August. The two current meters, at nominal depths of 39 m and 109 m in soundings of 134 m, appeared to have functioned correctly during the 65 days since the mooring was laid on 6 June.

Aim 3) The Anton Dohrn Seamount section was worked eastwards from Rockall during 9 and 10 August.

Aim 4) Though breaking waves were a rarity during the cruise, useful data of the vertical variation of temperature, humidity and wind during quiet conditions were collected by Professor Ling from sensors mounted on the bow A-frame and at two other levels above the foredeck. After the kite had been successfully flown underway on light dhan-buoy wire, the kite-sonde was used to obtain profiles up to 300 m height.

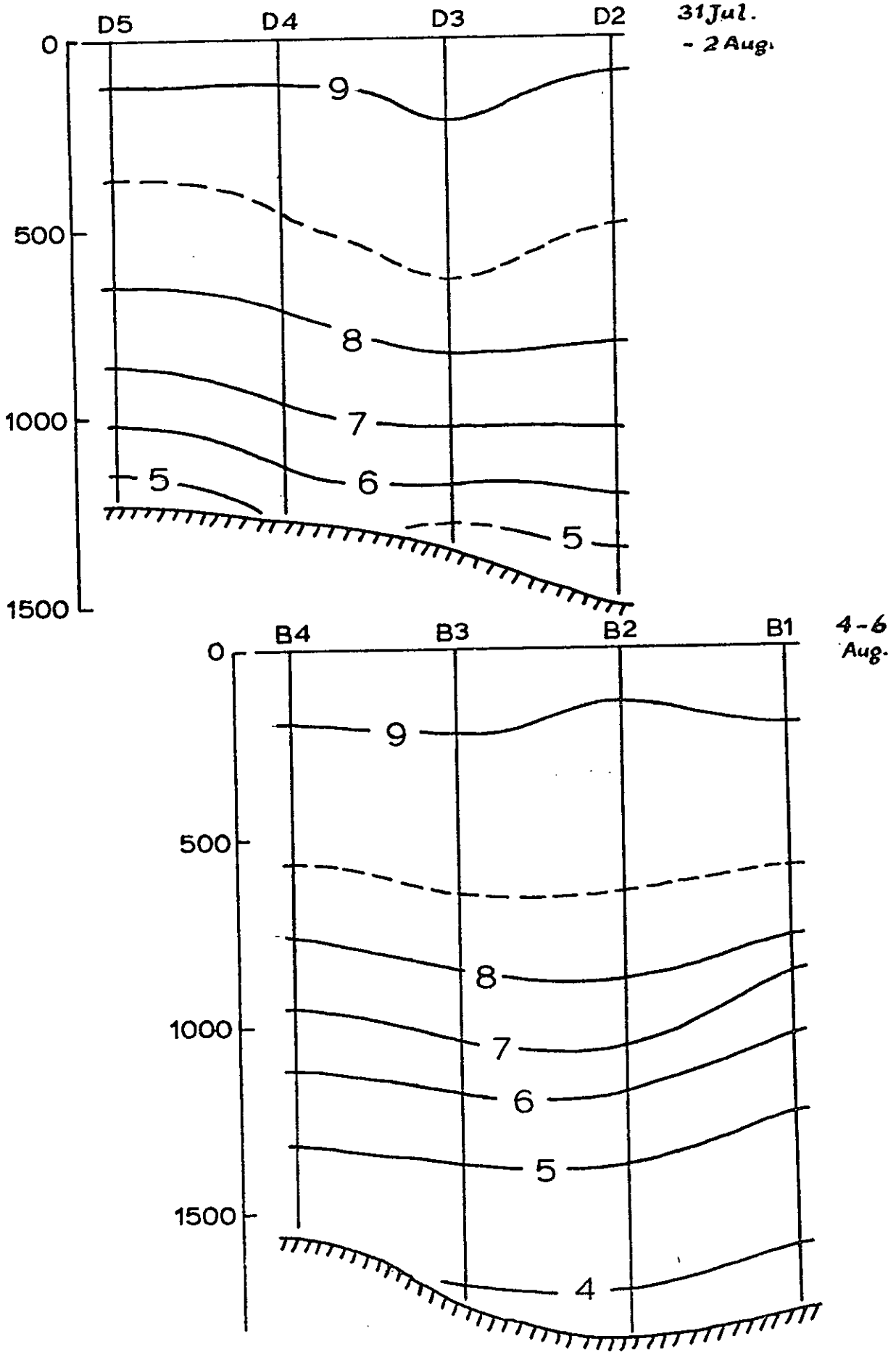
Aim 5) Miss Murphy obtained sets of oblique photographs of the sea surface and associated temperature and wind data at most daylight stations.

Aim 6) Underway measurements of chlorophyll-a were made throughout the cruise from the ship's non-toxic seawater supply using a Turner fluorometer logging to a HP9825A calculator. Temperature from the STD in a bucket fed by the same supply was also logged. A number of discontinuities were observed but detailed analysis of the data is not yet available.

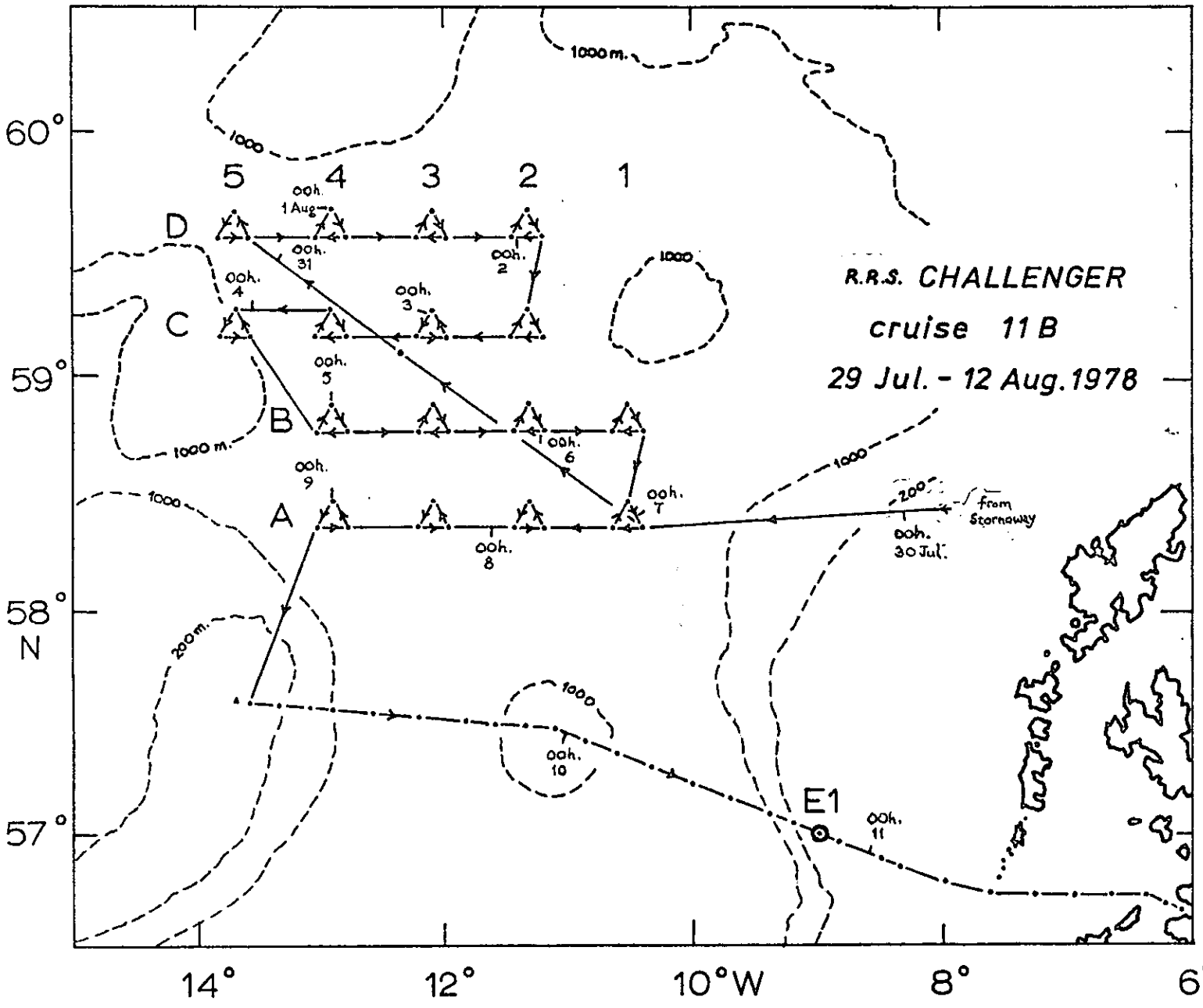
Aim 7) 50 litre surface water samples for radiocaesium analysis by the Fisheries Radiobiological Laboratory were collected at ten standard positions on the continental shelf. STD lowerings were made at all but the easternmost station.

D.J. Ellett

12 August 1978



Figures 1 & 2. Mean temperatures at triangles D2-D5 & B1-B4.


R.R.S. CHALLENGER
cruise 11B
29 Jul. - 12 Aug. 1978
1000 m.
1000
200 m.
200
5
4
3
2
1
A
B
C
D
E1
ooh. 1 Aug
ooh. 31
ooh. 2
ooh. 3
ooh. 4
ooh. 5
ooh. 6
ooh. 7
ooh. 8
ooh. 9
ooh. 10
ooh. 11
ooh. 30 Jul.
from Stornoway
60°
59°
58° N
57°
14°
12°
10° W
8°
6°

MIAS 2136