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1970 RESEARCH VESSEL PROGRAMME

REPORT: RV CORELLA: CRUISE 11

(PROVISIONAL: Not to be quoted without prior reference to the author)

STAFF

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J A Durance
J Wooltorton
R L Keable (9-20 November)
C A Turner
R A Hurst (20-22 November)

DURATION

Sailed from Lowestoft 1830 hours 9 November
Berthed at Lowestoft 1835 hours 22 November
All times in this report are British Standard Time

LOCALITY

Eastern Irish Sea

AIMS

To work with RV CLIONE in diffusion experiments to be carried out in the vicinity of Liverpool Bay.

NARRATIVE

CORELLA sailed from Lowestoft on the evening of 9 November and after a relatively slow passage due to adverse winds arrived at Dulas Bay, Anglesey at 1330 hours, 12 November. Here the sub-surface fluorometer was rigged and repairs to a hatch-cover carried out. Freshening winds prevented a planned dye release and had become force 8 by the following morning. The ship dodged overnight and sheltered off the eastern shore of the Isle of Man during 13 November.

At 0258 hours, 14 November the ship left Douglas Bay and proceeded to NW Liverpool Light Float for CLIONE's dye release. During the release, from 0920 to 1130 hours, Nansen casts and DRCM current profiles were made in the vicinity. From 1150 until 1730 hours the dye-patch was surveyed using fluorometers at the surface and 18 m depth and subsequently until 2040 hours at the surface only. Tracking with the surface instrument was resumed at 0220 hours on the following morning and continued until 1345 hours. Fourteen water-bottle stations around the western and northern boundaries of Liverpool Bay occupied the ship from this time until 0130 hours, 16 November, four stations being sampled at 10 m depth intervals for suspended load, and all at 5 m depth intervals for temperature and salinity. During this work, current-meter buoys A, F, H, E and D were visited; at position H the light was extinguished and at E a fixed light was being exhibited. The surface tracking of the dye-patch

resumed when CORELLA neared the NW Light Float at 0355 hours and continued until 0800 hours.

A breakdown of the ship's domestic refrigerator had occurred on 14 November and this was found to be not repairable on board. Arrangements were therefore made to call at Liverpool on 16 November, and in deteriorating weather the ship left Liverpool Bay for the Mersey at 0800 hours, berthing at Princes Dock at 1100 hours. After examination by local refrigeration engineers it became apparent that temporary repairs only could be effected, and these at considerable expense. It was agreed to manage with the very limited capacity of the laboratory refrigerator and to restock before the homeward passage and the ship left Liverpool at 1305 hours 17 November.

Survey of the Rhodamine-B patch was resumed at 1645 hours with the surface fluorometer. At 1800 hours the sub-surface instrument was lowered, but this was retrieved at 2040 hours due to increasing wind and swell. The surface survey continued until 0020 hours, 18 November. A series of hourly water-bottle stations spanning the tidal cycle was begun at 0830 hours on this day and concluded at 2150 hours; samples being taken for temperature, salinity and suspended load. A subsequent surface survey of the dye-patch ended at 0745 hours, 19 November, dodging in force 8 North-westerly winds having commenced at 0550 hours. By early evening wind and sea had moderated sufficiently for Nansen casts to be made and 10 stations were worked from 2000 hours around a triangular grid centered upon buoy 'B'. At five of these stations samples were collected for suspended load determinations, the work being completed at 0400 hours, 20 November.

CORELLA entered the outer harbour of Holyhead at 0830 hours, 20 November to interchange Messrs. Keble and Hurst with CLIONE. Upon completion of this the ship sailed for Lowestoft at 1100 hours. A rough passage in St. George's Channel was compensated for by fair winds in the English Channel and the ship berthed at Lowestoft on the evening tide of 22 November.

RESULTS

1. Over the course of five days, 14-19 November, when moderate to gale force westerly to northerly winds predominated the dye-patch indicated a small WSW residual movement. Full details are given in the report of the associated Cruise 14 of RV CLIONE.

2. The hourly water-sampling in the vicinity of the NW Light Float on 18 November showed the presence of a weak thermal gradient, the near-bottom observations being generally about 0.2 deg C warmer than those at the surface. The maximum difference observed was 0.5 deg C some 30 minutes before high water. The rise of bottom temperature at this time, followed by a general rise of temperature throughout the water-column at the time of the next observation suggests the passage of a mixing zone through the station at this time, but further comment must await the determination of the salinity values.

3. A similar situation seems to have been encountered some 20 miles to the west of the R Ribble on 15 November whilst working stations around the western and northern periphery of Liverpool Bay. Near-bottom

temperatures of 0.7 to 0.8 deg C above surface values were found in the region of greatest horizontal temperature gradients. Water-bottle stations worked on 19-20 November on the western and southern boundaries in northerly winds which were moderating from force 8 showed almost negligible thermal gradients.

D J Ellett
23 November 1970

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