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In Confidence: Not to be quoted
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6SR68

CRUISE REPORT

F.R.S. "SCOTIA"

25th July - 22nd August, 1968

This cruise had three objectives: (1) A study of herring shoal movements (July 25th - August 1st).

(2) Hydrographic studies of the northern slope of the North Sea. (August 2nd-8th).

(3) Hydrographic studies of the Norwegian Deep area. (August 9th-22nd).

PART I.

"Scotia" sailed from Aberdeen at 1300 hrs on the 26th July. Sedimentation samples were taken off Rosehearty en route to Lerwick to collect the "boss-boat". Work started on tracing herring shoal movement in the evening of the 27th July and continued with minor interruptions, due to crew changes and defects in the "boss-boat", until the evening of the 31st July when this part of the cruise ended.

Shoals within the operational range of the "boss-boat" were very much scarcer than in 1967 with the result that a considerable amount of time was lost in looking for suitable traces. In spite of this, two series of observations extending from dawn to dusk were made on a single shoal together with a shorter one covering about 3 hours in the evening of the 27th. The results have not yet been analysed in detail. They would seem however to largely confirm the results of 1967 that during the day when shoals are close to the bottom they maintain their geographic position whilst once they move off the bottom into mid-water their movements are broadly in line with tidal movements. Observations were also made of light intensity at the depth of shoals during their diurnal migration cycle. Two samples of plankton were taken and deep-frozen for biochemical analysis at T.R.S.

PART II

F.R.S. "Scotia" sailed from Lerwick at 0500 on 2nd August and work commenced at noon, continuing uninterrupted until 0300 on 7th August when passage was made to Aberdeen, docking taking place at 1130 on 8th August.

Three hydrographical sections were worked using reversers and the S.T.D. recorder. The latter gave values consistent with those of the normal sampling method but with a great deal more detail.

The first section was north westwards from Flugga to $61^{\circ}32'N$ $1^{\circ}51'W$, the second from $61^{\circ}15'N$ $0^{\circ}00'$ northwards to $62^{\circ}11'N$ $0^{\circ}00'$ and the last $62^{\circ}00'N$ $1^{\circ}30'E$ southwards to $60^{\circ}45'N$ $1^{\circ}30'E$.

Two or three parachute drogues were released between slope stations on each section at 50, 150 and 250 metres and tracked for 13 to 26 hours each. The resultant current values were consistent

and showed strong evidence of a slope current turning with the Norwegian Deeps between 1° and 2° E at a latitude of 62° N.

A marked thermocline was observed throughout the cruise with very low salinity water at the surface at $61^{\circ}00'N$ $1^{\circ}30'E$, indicative of a larger than normal outflow from the Norwegian Deeps.

PART III

"Scotia" sailed from Aberdeen at 2330 hours on 9th August and steamed to the Norwegian Deeps at latitude 59° N. Tests were started on the new prototype radio buoys but after the first few hours a fault developed in the ship board transmitter. The radio buoys were retrieved except for one which had become detached from the parachute drogue and radar buoy. A search for this radio buoy was abandoned at dusk. On the 12th a dye release was made and five surveys of the patch were carried out during the succeeding three days. The dye patch was exceptionally long and narrow and a detailed analysis should provide interesting comparisons with other studies in the North Sea.

"Scotia" went into Stavanger on 15th August for stores and repairs to the radio, sailing again on the 16th. A buoy mooring with three meters at 30, 60 and 220m was laid on the western edge of the Deeps in the transition area between the inflow of Atlantic and compensating outflow of mixed waters from the Skagerrak. A line of parachute drogues at 60m was laid extending from the Atlantic into the Baltic waters. These drogues, which had radio buoys attached, were tracked for three days, and a preliminary analysis suggests that they show entrainment of the Atlantic water into the northerly flow. The weather deteriorated on the 19th and 20th and wind strengths of 50 knots occurred. The radio buoys were lifted in these conditions except for one buoy with which radio contact was lost. This may have been due to the aerial breaking since these do not appear sufficiently sturdy. In the very bad weather conditions a visual search was unrewarding. On the morning of the 21st conditions moderated sufficiently for the buoy and current meters to be lifted and the ship proceeded to Aberdeen docking at 1230 hours on the 22nd August.

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