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CRUISE REPORT

F.R.S. "S C O T I A"

8th-25th November, 1958.

Narrative.

"Scotia" sailed from Aberdeen at 10.30 hours on 8th November. Heavy seas in the Moray Firth prompted anchorage in Sinclair Bay at 0200 hours on Sunday, 9th November. Conditions improved sufficiently by 0900 hours, 10th November, and the first station on the Butt of Lewis - Faroe Bank section was reached eleven hours later. Work proceeded normally to the completion of the fifth station on the section, but by mid-day, 11th November work had to be abandoned. Forecasts being particularly unfavourable, indicating continuance of storm conditions for at least two days, "Scotia" put back to anchorage in Broad Bay, Lewis.

In view of continuing storm forecasts for the Faroe region in conjunction with the loss of time to date, it was resolved on Thursday morning, 13th November, to abandon the Faroe-Shetland Channel part of the programme and concentrate on northern North Sea operations together with the I.G.Y station, if possible, north-west of Shetland. This was reached at 0900 hours on 14th November and despite rough conditions was completed thirteen hours later. Trawling was impracticable on the Flugga and N.E. to E. Shetland grounds early on the following morning and "Scotia" put into Lerwick for water and mails at 10.30 hours on that day, leaving again at noon the following day.

A successful trawl was carried out off Flugga and thereafter from the position $61^{\circ}01'N$ $0^{\circ}30'W$ eastward on the same latitude intensive hydrographic-plankton operations, including bottom current measurements with Carruther's "Pisa" current indicator, were carried out at 15 miles intervals. On longitude $0^{\circ}30'E$ repeated bottom current measurements were made for a period of 24 hours, using the electrically-modified Ekman current meter as well as the "Pisa" indicators.

A second 24 hours current station was all but completed on longitude $2^{\circ}E$ when adverse weather conditions again stopped work at noon on 19th November. "Scotia" proceeded eastward towards the third intended 24 hours station on longitude $4^{\circ}E$, but weather rapidly worsened towards the Norwegian coast, wind veering from S.E. to somewhat west of south, so "Scotia" made for Bergen on 20th November. Conditions modified sufficiently to enable work to be resumed on Sunday 23rd November and by 0100 hours on 25th November seven stations, including four successful trawl hauls, on latitude $60^{\circ}01'N$ to Shetland had been completed. "Scotia" thereafter proceeded to Aberdeen, berthing there at midnight on the same day.

Hydrography

Water column temperatures of over $11^{\circ}C$ to $11.75^{\circ}C$ in the uppermost 100-metre layer to 60 miles N.W. of the Butt of Lewis, were distinctly above normal for the time of year, indicating a strong Atlantic current through the Faroe-Shetland Channel. Likewise, observations to over $10^{\circ}C$ on latitude $61^{\circ}01'N$ suggested the incursion of abnormally warm oceanic water into the north-western area of the North Sea. Eastward beyond longitude $1^{\circ}00'E$ a slight diminution in the water-column temperature indicated convergence of North Sea waters with the incoming oceanic water-mass. Only at longitude $1^{\circ}30'E$ were colder bottom waters of under $8^{\circ}C$ encountered.

A similar temperature distribution was registered along latitude $60^{\circ}01'N$ from Norway to Shetland.

With regard to the bottom current measurements made, these must be more closely scrutinized in conjunction with tidal stream observations before pronouncement is possible on the results. The most significant measurements were

of course those made at the 24 hours stations and it is satisfactory that two such stations were almost completed. The results from these should enable at least tentative assessment to be made of upper water mass inflow into the northern North Sea between Shetland and Norway, but the lack of measurements at the third projected 24 hours station will preclude similar assessment of outflow from the Northern North Sea in this region.

Especially for particularly small apparent bottom current speeds, the same difficulty as was commented upon in a previous report was encountered with the "Pisa" apparatus in determining within sufficiently narrow limits the direction of the current. It seemed again that a cylindrical jelly/oil bottle rather than the hexagonal one would probably at least modify this difficulty.

Under the weather and sea conditions obtaining, together with the present facilities on "Scotia", only one operation with the Ekman current meter was carried out, but this gave what appears to be a very reliable result as regards both direction and speed of bottom current.

Plankton

Hauls taken at the southern end of the Butt of Lewis - Faroe Bank line yielded Salpa fusiformis in small numbers, especially at the nearer land stations. Crustaceous plankton was generally poor. Sulculeolaria biloba was taken at all stations from surface down to 250m. Sagitta serratodentata was abundant in the shallow waters at the Butt of Lewis.

Salpa fusiformis was also present in small concentration at the I.G.Y. station in B21d.

Hauls made on latitude 61°01'N from Shetland to longitude 2°E were very poor, only meganyctiphanes norvegica being present in appreciable numbers.

Euphausiids were abundant on the latitude of 60°N near the Norwegian coast and Sagitta elegans was dominant all along the line to Shetland.

Trawling

Trawl samples were taken at six positions, one on the Flugga line, one on the 61° line and four on the 60° line - the best catches were made on the 60° line. All megrims taken were preserved and the stomach contents of all cod were noted.

At two positions on the 60° line, viz. G19e and F19c good samples of Haddock (29-44 cms.) were taken - 163 and 226 respectively - and at stations F21d, H19c, G19c and F19e fair numbers of small haddock (12-20 cms.) were present in the hauls. Whiting were not taken in any quantity at any station, but a few small samples of otoliths were obtained.

J.B. TAIT
3rd December, 1958.