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In Confidence: Not to be quoted without reference to the Laboratory.2
4SR69CRUISE REPORTFRS "SCOTIA"19 April-13 May, 1969Narrative

Although the cruise was scheduled to start on 21 April, "Scotia" in fact sailed from Leith at 1500 hours on Saturday, 19 April and proceeded north, in fair weather, to the position of the outermost buoy off the Ythan estuary. The weather deteriorated overnight but all three buoys were lifted successfully and "Scotia" proceeded to Aberdeen where she docked at 2000 hours on 20 April.

Since Monday was the local holiday, the unloading of the buoys and the loading of scientific equipment for the main part of the cruise were postponed until Tuesday, 22 April, and the replacement of trawl warp to the port winch until the morning of Wednesday, 23 April. Later that day, at 1720 hours, "Scotia" cast off and proceeded to Point Law for fuelling and then sailed out eastwards into an uncomfortable swell.

Work commenced at 57°00'N 01°00'E at 0906 hours on 24 April, but at 1820 hours "Scotia" was forced to start dodging because of a south-easterly wind. By 0425 hours the following day it had become necessary to return to Aberdeen to land a seaman for medical treatment. The rest of that day was spent in passage towards Aberdeen and "Scotia" arrived at Aberdeen Bay at 0500 hours on Saturday, 26 April. The seaman was transferred to the pilot boat and "Scotia" left at 0520 hours.

By noon on 26 April work had recommenced (at 57°30'N 00°30'W), and working first eastwards, then northwards over the area of the Norwegian Deeps and westwards towards Shetland, the cruise continued to be favoured by excellent sea conditions until the afternoon of Sunday, 4 May, when one station, to the west of Shetland, had to be abandoned. Overnight "Scotia" proceeded round Sumburgh Head and docked at Lerwick at 0515 hours on 5 May.

"Scotia" sailed from Lerwick at 1545 hours on 6 May. Sea conditions were again excellent and, after working in the area east of Shetland, "Scotia" surveyed the area east of Orkney, the Moray Firth and the area off north-east Scotland. During the night of 11/12 May "Scotia" proceeded to Peterhead Bay, where Mr Murray joined the ship at 1030 hours to conduct sea trials of the new warp metering system for FRV "Clupea". The trials had been completed by the early hours of Tuesday, 13 May, when "Scotia" proceeded towards Aberdeen where she docked at 1140 hours, having navigated towards the harbour in dense fog.

All but one of the programmed stations had been completed, together with 6 additional environmental and 15 trawl stations.

RESULTSHydrography

Surface temperatures ranged from less than 5°C in the south-east of the area surveyed, to 9°C to the north-west of Shetland. In general, isotherms ran from south-west to north-east with the exception of the area in the region of 3°E, where a tongue of warmer water extended south from approximately 61°N to 59°N. Bottom temperatures ranged from less than 4°C in the south-east to about 8°C to the north-west of Shetland, and again indicated a tongue of warmer water about 3°E.

As is normal, the surface salinities were dominated by the low salinities recorded over the Norwegian Deep. In the latter area the salinity ranged from less than 33.0‰ to 34.5‰, with salinities of less than 35.0‰ to the immediate west. Salinities of less than 35.0‰ were also recorded off the Moray Firth and off the Aberdeenshire coast. To the east and west of Shetland salinities of greater than 35.25‰ were recorded. These high salinities to the east and west of Shetland were also found at the bottom, but in addition a tongue extended south along 3°E.

Productivity and Plankton

Over large areas the chlorophyll a values were less than 1 mg chlorophyll a/m³; only over the northern part of the Norwegian Deep, east and south-east of Shetland, north and east of Orkney and south of 57°30'N did values greater than 1 mg/m³ occur. In these areas of higher chlorophyll a the average value was 1.9 mg/m³.

Carbon samples were collected at selected stations.

For the first time during this series of cruises zooplankton samples were dried on board ship. In addition, duplicate samples were preserved in the normal manner and some additional samples were stored in the deep freeze. Although further drying in the laboratory reduced the dry weight by about 6%, this has little effect on the geographical positions of the contours at 1, 3 and 10 g dry weight/100 m³.

In general, an area of high zooplankton standing crop (> 3 g dry weight/100 m³) covered the south-eastern half of the survey area with the exception of the part of the area affected by the tongue of water about 3°E. Areas with greater than 10 g dry weight/100 m³ were very limited.

Plankton sampling was also carried out using a standard net, a WP2 net and WP3 nets. Multi-depth plankton indicator samples were obtained for the SMBA together with special single depth indicator samples in selected areas.

Samples were obtained for Mr Harkness of the University of Glasgow.

Fish

The echo-sounder was run more or less continuously to obtain information on the distribution of pelagic fish. A preliminary examination of the records showed the main concentrations of traces to be to the west of 1°E. East of 1°E appropriate mid-water traces were found only south of 58°30'N but a number of near bottom shoals were detected at a number of places near the edge of the Norwegian Deep. A large fleet of purse seine vessels was operating about 58°30'N 03°40'E on 29 April.

Due to the excellent weather conditions during most of the cruise, it was possible to complete 15 trawl hauls. The highest herring catches were obtained from the Moray Firth where 4,900 (modal length 17.5 cm) were caught in one one hour haul, and 1,169 (modal length 18.0 cm) in another. In the Fladen area catches were 405, 334, and 9 per haul, the two larger catches showing a bimodal length distribution (19.5 cm and 22.5 cm), but only one herring was caught in the area east of Shetland. 66 were caught in the vicinity of the fleet of purse seine vessels.

The highest haddock catches (340 to 2,124 per haul) were found in the area south of 59°N. The highest whiting catch was only 269 per haul but these were also more abundant south of 59°N. Of the other gadoids the highest catches were - cod 21, saithe 207, hake 6, ling 5, tusk 3, Trisopterus esmarkii 4,028 (in H16d), T. minutus 9, Gadiculus 24 and blue whiting 22.

Of the flatfish, long rough dabs were the most abundant (up to 246 per haul) and common dabs the next (up to 42 per haul). The other flatfish caught were - lemon sole (1 to 18 per haul), witch (1 to 2), megrim (1 to 13), plaice (1 to 21) and one turbot at one station at D20a.

J A Adams
8 August 1969