R1/5 10SR65

In Confidence: Not to be quote without reference to the Laboratory.

CRUISE REPORT

F.R.S. "SCOTIA"

5th - 29th October, 1965.

PART I NEPHROPS STUDIES. 5th - 12th October

Gear and camera studies were carried out on Nephrops on the Fladen ground, "Scotia" leaving Aberdeen at 21.45 hrs. on the 5th October and returning at 02.00 hrs. on the 12th.

The trawl used was the laboratory's newly-designed herring trawl, fitted with a rope-rounded ground rope to which 5 x 2 fm lengths of $\frac{3}{8}$ in. chain had been attached in each wing. Two days were spent experimenting with the headline height. This was measured by means of a manometer and the spread by means of an electronic spreadmeter. In order to obtain the best catch of Nephrops the trawl was towed at approximately 2 knots, i.e. less than the normal trawling speed.

The measurements obtained in addition to their bearing on the catch of Nephrops are interesting from the engineering point of view since they complete the curves of trawl geometry configuration against speed of tow.

Haul No.	Arrangement of floats on headline	Headline height (ft.)	Spread (ft.)
S65/233	10 + 10 + 10	2.7	42
234	10 + 10 + 10	4.2	42
235	10 + 10 + 10	5.3	27
236	15 + 12 + 15	7.7	45
237	15 + 18 + 15	8.7	-
238	15 + 18 + 15	9.6	39
239	15 + 18 + 15	9.5	42

The tailoring of the net was thus shown to be adequate since the spread was not grossly affected by changes in headline height.

The headline height attained, approximately $9\frac{1}{2}$ ft., was considered satisfactory and the 15 + 18 + 15 arrangement of floats was retained for the next eighteen hauls, on all of which the camera was used. In view of the slow towing speed it is interesting to note the large catches of round fish which were taken. One 1 hr. haul yielded 20 baskets of whiting and another haul 16 baskets of whiting and $5\frac{1}{2}$ score of large cod.

Catches of Nephrops were poor at first but later an area was found which gave moderately good results, up to 717 per hour's fishing. The Nephrops were mainly small, the mode being about 30-31 mm. Catches were best at dawn and dusk.

PART II NORTHERN NORTH SEA TRAWLING AND HERRING ENVIRONMENTAL SURVEY. 13th-29th October.

Narrative

For this part of the cruise Messrs. Priestley and Leys were replaced by Mr. K. McKenzie and Mr. G. Spowart (S.M.B.A.).

Scotia sailed from Aberdeen at 15.00 hrs. on the 13th October. The first station (Buchan Deeps) was completed the same day. "Scotia" then worked her way across the North Sea towards the Skagerrak. Owing to rough seas and damage to a fuel tank sounding pipe, it was impossible to trawl, though plankton, hydrography and productivity samples were taken. The herring environmental stations in the Skagerrak and over the Norwegian deeps were then worked with only two short stoppages for bad weather. Temporary repairs to the sounding pipe having been effected, three trawls were made on the edge of the Deeps. After working northwards to 60°30'N, "Scotia" put into Bergen for water and supplies, arriving there at 10.00 hrs. on the 21st.

Whilst in Bergen, members of the scientific staff visited the Fisheries Institute and Aquarium and the Scientist-in-charge of the cruise had valuable discussions with Mr. Gundersen and Dr. Wiborg.

"Scotia" left Bergen at 16.00 hrs. on the 22nd and proceeded to the western half of the survey area. With a day's interruption by the weather, work went on until the 28th. A further 16 trawls were carried out and environmental studies were carried out at a number of other stations. On the afternoon of the 28th a severe south-westerly gale compelled "Scotia" to stop work. She therefore made for Aberdeen, arriving on the morning tide on the 29th.

Trawling

On the whole trawl catches were good. Whiting were abundant near the Scottish coast and hauls of up to 25 baskets per hour's fishing were taken in the Moray Firth. Further offshore haddock were abundant, at least three baskets being taken in most hauls and as many as 20 baskets in area E19d.

Herring and sprat were taken in the upper part of the Moray Firth, where local boats were fishing commercially for sprat.

Moderately good catches of Nephrops in the Moray Firth consisted largely of small specimens of less than 30 mm carapace length.

Fair catches of squid, particularly of Loligo, were taken in the Moray Firth.

Catches were treated according to standing instructions and cod were examined for nematodes. Live fish were brought back for the aquarium.

Plankton and Productivity

Gulf III samples were taken at each of the 63 stations worked. Horizontal and oblique townet and vertical standard net hauls were made at specified stations.

Salps were abundant in catches from the central part of the northern North Sea to the outer Moray Firth, less abundant from near Fair Isle and absent from catches in the inner Moray Firth and

east of Orkney. Calanus was also abundant in the northern part of the area surveyed and Sagitta setosa was recorded as far north as 60° over the Norwegian Deeps. O+ Meganyctiphanes norvegica were common in the shelf area and over the Norwegian Deeps and 1+ specimens were also common over the deeps. Little phytoplankton was found except in area B15a.

Multi-depth plankton indicator samples were taken at all stations for the S.M.B.A. laboratory at Leith.

Two-litre chlorophyll samples were taken at all stations and 4-litre carbon samples at 21 stations.

Hydrography and Chemistry

At all stations the surface temperature was recorded and surface samples taken for salinity, phosphate, nitrate, silicate and oxygen determinations. This procedure was repeated at the bottom at specified stations.

Surface temperatures ranged from 13.45°c off the Danish coast to 10.58°c east of Shetland.

JAMES MASON

16th November, 1965.