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## CRUISE REPORT

FRS "EXPLORER"

30 November - 22 December 1970

## OBJECTIVE

The objective of the cruise was to conduct a mid-water trawling survey for blue whiting in the area between the Faroes and east Iceland.

## NARRATIVE

To avoid delay, the "Explorer" was loaded in Leith and sailed at 1900 hours on 30 November. A direct course was set for Klaksvik to meet the Norwegian research vessel "G.O. Sars" for discussions about collaboration during the cruise. The "Explorer" remained in Klaksvik from 1800 on 2 December until 1315 the next day, and began a steam northwards along 6°W. By 1000 hours on 4 December the ship was forced to heave to by the weather which remained too bad for trawling until 0930 on 7 December. During this period an echo-survey was carried out to locate the most intense "blue whiting" traces.

A further period of inactivity was caused by gales from 1800 on 7 December until 0900 the next day, by which time a leak had developed in the ship's condensers. The "Explorer" arrived in Klaksvik for repairs at 1500 on 9 December and left at 1300 on 11 December. After a brief call into Torshavn to compare echo-sounder records with the "G.O. Sars", a course was set for the area around 64°10'N 09°10'W indicated by their records to be rich in blue whiting. During the passage good traces were encountered at 63°34'N 08°04'W and two trawl hauls were made on 12 December, but with little success.

Moving northwest further gales blew up at 0030 on 13 December and lasted till 2300 hours. In a brief spell of good weather on 14 December, 30 baskets of blue whiting were caught in a trawl lasting 2 hours 20 minutes, and another two hauls were possible the next day. On the second, the receiving transducer for the Furuno netzsonde was damaged beyond repair by being wrenched through the trawl warp pulleys.

Subsequently, the "Explorer" proceeded south along 9°W to survey the extent of blue whiting traces. Force 9-10 winds, however, impeded work on 16 and 17 December, and after a brief echo-survey to the southwest of Faroe plateau the ship arrived in Torshavn to collect mail at 1200 on 18 December.

Slightly delayed by high winds, "Explorer" sailed at 1100 on 19 December and had crossed the Faroe-Shetland channel by midnight. Though the possibility of further trawling was ruled out by the weather, a short zig-zag echo-survey was carried out northeastwards along the continental shelf and over the deep water. At 1700 hours on 21 December the ship set off for Aberdeen, and docked at 2000 the next day.

While at sea, radio-telephone contact was made twice a day with the RV "G.O. Sars" to exchange information on progress made.

## ECHO SURVEY

Since the RV "G.O. Sars" planned to survey a large area between the Faroes and Iceland using a narrow beam echo integrator to estimate the relative intensity of blue whiting traces, "Explorer" undertook to carry out additional transects within this area. The Simrad scientific sounder was used throughout. In the figure appended, a simplified cruise chart is shown, together with an indication of where blue whiting traces were located.

Mid-water traces were present over the entire survey area north of the Faroes, though at variable density. Typical "blue whiting traces" shown to contain this species by trawling, which at night consisted of dispersed marks between 400 and 200 m, possibly caused by single fish, gradually descended at dawn (around 1000 hours) to become during daylight hours a hard thin trace at around 260-300 m, with variable quantities of dispersed marks below; and the reverse happened at around 1600 hours. In this way a diffuse trace at night might become a distinct trace during the day, thereby invalidating subjective comparisons of trace intensity in different areas.

Around the edge of Faroe plateau the traces were more diffuse and may have been caused by planktonic organisms. Crossing the Faroe-Shetland channel heavy diffuse traces, which may have been planktonic in nature, were recorded at 100-150 m over the edge of the Faroe plateau and in the deep water. Moving south these gradually disappeared and there was no evidence of rich traces over the continental shelf. There was no indication of blue whiting traces in this area.

During the survey the surface thermograph was run continuously and the results have been passed to the scientific personnel on board the "G.O. Sars" for incorporation with their more detailed hydrographic data.

## MID-WATER TRAWLING

A 1400 mesh Engel trawl was used together with large Suberkrub otterboards. The codend was of 30 mm mesh netting, though in the last few hauls a cover, consisting of  $\frac{1}{2}$  inch knotless mesh, was placed over the codend to sample fish and planktonic organisms too small to be retained by the codend.

The trawl was fitted with netzsonde, either a Furuno transducer with a high frequency sonic link to a receiving transducer, or a Kelvin Hughes transducer connected to the ship by cable. With the almost continuous bad weather only six trawl hauls were possible, barely sufficient to gain the necessary experience to use the instruments successfully.

On the first two hauls the Furuno was used, but the depressor arrangements were unsatisfactory and the paper record was obscured by noise caused by aeration in the ship's wake. In Klaksvik a trawl warp mounting was constructed for the receiver, and this was used successfully until it was damaged in the warp pulley.

Interpretation of the trace on the Furuno netzsonde was made difficult by a fault which caused double traces to appear on the record. This was repaired but only one subsequent trawl was possible. The results using the Furuno equipment indicate that the sea-surface is clearly visible in the upward mode from depths down to 100 fathoms, whereas the blue whiting traces only appeared on the downward mode when they were in the net mouth. The catch of 30 baskets of fish appeared as a series of marks over a duration of about ten minutes.

The Kelvin Hughes transducer was used on two occasions but gave poor results owing to a fault in the recorder/transmitter.

## CATCH ANALYSIS

Excluding one haul not taken on board when the netzsonde failed to function, six hauls were made in the area north of the Faroes. The times, positions and blue whiting catches are listed in an appendix.

The majority of blue whiting caught ranged in size from 23-35 cm with a mode at around 29-30 cm, ie about the same modal length as in December 1969. In addition small numbers of fish from 15-21 cm were caught and it is thought that these were 1-group (i.e. the 1969 brood). Samples of otoliths and stomachs were collected for further analysis.

Other species caught were a single Cyclopterus lumpus and a number of Paralepis sp. Thirty Maurolicus muelleri were retained in the small mesh cover on one haul, together with a single squid (Calliteuthis reversa), and a number of large euphausiids.

## ACKNOWLEDGMENT

It is a pleasure to record our appreciation of the helpful advice and stimulating collaboration from the scientists aboard the RV "G.O. Sars" during the survey.

R S PAILEY  
26 January, 1971

# APPENDIX

Details of mid-water trawl hauls made in Faroe/Iceland area, December 1970

<u>Haul No.</u>	<u>Date</u>	<u>Times</u>	<u>Shooting Position</u>	<u>Blue whiting catch, no. of fish caught</u>
256	7 December	1122-1558	65°09'N 07°11'W	50
257	12 December	1015-1250	63°31'N 08°06'W	300
258	12 December	1815-1945	63°48'N 08°36'W	33
260	14 December	1340-1600	64°10'N 09°20'W	ca 5200 (30 baskets)
261	15 December	1012-1140	64°09'N 09°28'W	732 (4 baskets)
262	15 December	1345-1910	64°22'N 08°42'W	70

