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## CRUISE REPORT

F.R.S. "EXPLORER"

10th May-3rd June 1968

Narrative

"Explorer" sailed from Aberdeen at 1140 hours on 10th May and made a passage to Stornoway, arriving at 0900 hours on 11th and landing an engineer who had been carrying out tests on the log. The ship sailed at 1300 hours on 11th and made a passage to Rockall, working plankton stations on the way. From 12th-17th May a trawling survey was carried out with some hydrographic and plankton sampling. At the end of this survey, two days were devoted to an intensive hydrobiological survey of a small area on the eastern edge of the bank. The ship then worked a line of plankton stations back to the Butt of Lewis and proceeded to Stornoway, arriving at 0800 hours on 20th May.

After exchanging scientific staff "Explorer" sailed from Stornoway at 1600 hours on 22nd May and reworked the line of plankton stations to Rockall. After this, a detailed hydro-plankton survey of the bank was carried out until the 30th May when "Explorer" left the area to work a line of hydro-stations to St. Kilda.

On passage to Aberdeen 24 hours were spent in the Moray Firth on a hydrophone search for two missing current meters, unfortunately without success. "Explorer" docked in Aberdeen at 1800 hours on 3rd June.

Hydrography

Unfortunately, owing to delay in the dates of delivery of equipment, the use of radio dhans on the parachute drogues was not possible. Ad hoc hydrographic lines on the Bank were worked.

Chemistry and Productivity

Throughout the cruise a Technicon Analyser was run continuously to provide surface nitrate data. A second Technicon was run intermittently on phosphate, silicate or nitrite but further development, particularly a separate recorder, is necessary for satisfactory measurement.

The Turner fluorometer was run continuously for chlorophyll and extensive in vitro sampling was carried out for calibration purposes. It is likely that calibration is poor, probably  $\pm$  50% but the technique is still useful in showing short term fluctuations.

Especially, these methods of continuous recording show up the marked changes that occur, both at the edge of the continental shelf and also at the edge of the Rockall Bank. Further, on the bank, the data provide indications of upwelling and consequent production, particularly on the northern and eastern sides of the bank.

Phytoplankton sedimentation samples were collected for Dr. Gillbright, Kiel, for comparison with the chlorophyll data and with  $C^{14}$  estimates of production.

Deep water microbiological studies were carried out by Dr. Munro in the centre of the channel between Rockall and St. Kilda.

## Plankton

A rough analysis of the Gulf III samples obtained during part I of this cruise indicates that, as on the equivalent survey during May 1967, Calanus numbers were again much higher on Rockall Bank, within the 200 fm contour, than over the surrounding deeper water.

Micromesistius poutassou larvae were nowhere as abundant as on the 1967 survey, the highest catches did not exceed 70 per 100m<sup>3</sup> and hauls of this order of magnitude were confined to the areas North and North-West of Rockall.

During part II of the cruise an extensive survey of the area was carried out using the w.p.3 net. Calanus numbers remained high within the 200 fm contour except at the South-East margins of the bank where the presence, at several positions, of Lusitanian species suggests a greater degree of inflow on to that part of the bank. Pelagia perla and Aglantha digitalis were abundant over the whole area with, at the North, West and South boundaries of the survey, an admixture of substantial numbers of Laodicea undulata.

Salpa fusiformis, though never abundant, was present in moderate numbers along and beyond the 200 fm contour but was not taken over the shallower part of the bank. The salp Iasis zonaria occurred at two positions, one mid way between Rockall and St. Kilda and the other over the deep water North of the bank. Lusitanian species, e.g. Phronima sedentaria, Diacria trispinosa and Rosacea spp. were more abundant and had penetrated further North to the East of Rockall bank than to the West.

The numbers of Micromesistius poutassou larvae in the w.p.3 net hauls during part II of the survey were very low but the larvae were widely distributed both on the bank and out over the deep water. In general, these larvae were of quite a large size; some had attained a length of 2.8 cm. Despite the relative inefficiency of the w.p.3 net as a larval fish sampler, it did catch substantial numbers of the larvae of Gadiculus argenteus, Myctophid sp. and Argentina sp. It seems possible that the low numbers of Micromesistius poutassou larvae per haul, with the w.p.3 net are more directly attributable to the increase in avoidance ability of the larger larvae and to the effect of natural dispersion.

## Trawling Survey

A total of 19 trawl hauls were made during the first part of the cruise. The grounds surveyed extended over a wide area at Rockall and at various depths ranging from 74-240 fathoms.

In general, fishing was good. Catches of up to 107 baskets per hour were taken and the average catch per haul was over 30 baskets. The best yields were obtained at depths greater than 100 fathoms, where blue whiting was the principal species caught, averaging over 20 baskets per hour. The highest blue whiting catch was 76 baskets in a one hour tow. At depths less than 100 fathoms catches were generally small and blue whiting were scarce. These yields of blue whiting compare favourably with the results obtained in May 1967 when up to 58 baskets of blue whiting were taken per hour at Rockall.

Most of the blue whiting were recovering spents and their lengths ranged from 19-41 cm. The size composition varied from area to area with mean lengths of sampled catches ranging from 25-31 cm.

Silver smelts (Argentina sphyraena and A. silus) were taken in substantial quantities in a good proportion of the hauls. Catches of up to 11 baskets per hour of A. silus and 4 baskets per hour of A. sphyraena were obtained. A. silus was distributed mainly at depths greater than 100 fathoms and A. sphyraena at depths less than 100 fathoms.

Other species of importance in the hauls included rabbit fish (Chimaera monstrosa) which yielded up to 11 baskets per haul, dogfish (Spinax niger) and Sebastes sp.

One 24 hour station was worked to obtain further information on diurnal variation in catches at Rockall. On this occasion catches at night were greater than those made by day.

J. H. Steele  
17th June, 1968.