

R.1/4

In confidence: Not to be quoted without reference to the Laboratory. 5LR67<sup>5</sup>

## CRUISE REPORT

F.R.S. EXPLORER

31st May - 4th July 1967

Narrative

EXPLORER sailed from Aberdeen at 2000 hours on 31st May and proceeded to the west coast. Some preliminary trawling and gear testing work was carried out on 1st and 2nd June at positions northwest of the Butt of Lewis. As arranged, Mr. Ritchie joined EXPLORER at Stornoway in the evening of 2nd June and EXPLORER proceeded to Rockall Bank, a line of hydro and plankton stations being worked en route to the northern edge of the Bank where an intensive plankton survey for blue whiting larvae was begun. Except for some short interruptions due to stormy weather, this work continued until 8th June when EXPLORER made for Greenock where she berthed on 10th June.

After repairs to radar, echosounders and other equipment had been completed, EXPLORER sailed from Greenock on the afternoon of 12th June, returning to Rockall to complete the programme of plankton sampling and to carry out a fishing survey. This work continued until the afternoon of 20th June when the ship proceeded to grounds on the edge of the continental shelf. Fishing began at a position to the northwest of Ireland on 21st June and the survey was continued northwards along the edge of the continental shelf until 26th June, when EXPLORER put into Stornoway to land a sick member of the crew and replenish freshwater supplies. She sailed from Stornoway in the afternoon of 27th June and returned to the ground northwest of St. Kilda. A period of stormy weather hindered the work, however, and trawling was not resumed until 30th June. The survey continued until 3rd July when EXPLORER returned to Aberdeen and berthed there at mid-day on 4th July.

Trawling Survey

The survey with the bottom trawl was conducted in two main areas, on Rockall Bank and along the edge of the continental shelf from 55°30'N to 59°04'N.

## a) Rockall Bank

In general, fishing at Rockall was reasonably good at depths ranging between 180 and 240 metres. The highest catch was 86 baskets in a one-hour haul and other good catches of 73 and 71 baskets per hour were obtained at different positions on the plateau. In addition, there were several hauls which yielded from 25 to 41 baskets per hour.

Blue whiting generally formed the bulk of the catch with yields of up to 66 baskets per hour. The majority of these fish ranged from 20-30 cm in length with a modal length of about 25 cm. In some catches the samples also contained some smaller blue whiting ranging in size from 11-16 cm. Both species of silver smolt, Argentina sphyraena and A. silus occurred together in several hauls. They were generally easy to separate on a length basis, A. silus ranging from 37-46 cm in length and A. sphyraena from 16-30 cm. Catches of up to 12 baskets per hour of A. sphyraena and of up to 5½ baskets per hour of A. silus were taken. Among the other small fish species which were sometimes prominent in the hauls was Gadiculus, which yielded about 30 baskets in one haul; they ranged in size from 8-16 cm.

The principal species of commercial importance in the catches was haddock, which were widely distributed over the Bank and yielded between 2 and 6½ baskets per hour. These were good quality fish, ranging in size mainly from 30 to 50 cm. Apart from haddock, some small quantities of ling, coalfish and rays were also caught. Rabbitfish (Chimera monstrosa) were also common in the hauls in this area and catches of up to 2 baskets per hour were taken.

Coral appears to be widely distributed over a major part of Rockall Bank and varying quantities were taken in the trawl. In one haul considerable damage was caused to the net by coral and extensive repairs were required.

#### b) Continental Shelf Survey

Trawling in this area was less productive than at Rockall. The best catches (20-44 baskets per hour) were obtained at depths between 140 and 240 metres to the west of St. Kilda, but over most of the area surveyed the catches were mostly less than 10 baskets per hour. Blue whiting was the most important component of the catch in the larger hauls, with up to 44 baskets per hour being taken off St. Kilda. Most of these fish ranged from 18-30 cm in length but varying proportions of small fish in the 10-16 cm size group were also obtained.

Among the commercially important species varying but small quantities of haddock, cod, ling and coalfish were caught. In one haul at the southern end of the survey area a basking shark, measuring 14 ft 3 in., was taken in the trawl.

While most of the survey was carried out by bottom trawl, the midwater trawl was also shot on a number of occasions. In one haul with this gear at Rockall a catch of  $\frac{1}{2}$  basket of blue whiting was obtained. In another haul, made off St. Kilda, the catch consisted of 1 basket of herring, 1 basket of mackerel and a few blue whiting.

#### Underwater Camera

Whenever conditions were suitable, the underwater camera was fitted to the headline of the trawl; although some technical difficulties occurred with the film transport system and with focussing, over 20 film records of hauls were obtained with many frames showing fish. The camera was also used to try to identify the organisms producing a midwater trace off the southern edge of Rockall. Unfortunately, the film transport system did not function properly and only a few frames were obtained, showing small plankton organisms which could have been salps. A plankton haul taken at this position also contained fair quantities of Salpa fusiformis.

#### Plankton Sampling

An intensive plankton survey was carried out over Rockall Bank to assess the abundance and distribution of blue whiting larvae. At each station an oblique haul was made with a w.P.3 net and at occasional stations additional comparative hauls were made with a Gulf III.

Relatively few blue whiting larvae were observed (<10 per haul), in contrast to the previous survey in May when very large numbers were taken. The larvae caught measured 2-2 $\frac{1}{2}$  cm in length. Their distribution, as on the previous cruise, appeared to be confined to the area over the Bank, where the plankton was again characterised by Calanus and other crustacean species; at stations in the deeper water off the Bank crustacean species were scarce while 'oceanic' species such as Aglantha sp. and Salpa fusiformis were common.

#### Hydrography

For hydrographic sampling, a small hydrographic winch with a drum capacity of 250 metres of wire was fitted to a platform on the port side of the boat deck. This temporary system worked reasonably well under good weather conditions.

Lines of hydrographic stations were worked between the continental shelf and Rockall Bank, across the Bank itself and to the south of it. Temperatures, salinities and phosphates were taken at all standard depths from 0-200 metres. In general, temperatures at 150 and 200 metres over the Bank were up to 1°C lower than those obtained at the same depths over the deep water off it.

## Echosounding

Most of the echosounding survey was carried out with the Marconi Seagraph, but the Melvin Hughes Humber echosounder was used during trawling operations; some records were obtained with the expanded scale recorder but a fault developed in this apparatus which could not be rectified during the cruise.

Diffuse layer traces were fairly widely distributed over a major part of the area surveyed at Rockall and along the edge of the continental shelf. Most of these diffuse layers occupied the upper 50 fathoms although they occasionally extended into deeper waters.

Some good traces were also obtained near to the sea bed and at Rockall these bottom traces were often associated with good catches of fish. While many of these traces were recorded close to the sea bed, others were located 10-15 fm above it and generally occurred in areas where the total depth was less than 150 fathoms. Some evidence of diurnal vertical migration of the traces was obtained, and one haul with the midwater trawl in late evening yielded half a basket of blue whiting. Some good midwater plume traces were obtained off St. Kilda where a midwater trawl haul in this locality yielded one basket of herring, one basket of mackerel and a few blue whiting.

I. G. BAXTER  
4th August 1967