

R E P O R T

on

Hebrides-Faroe-Iceland Cruise by F.R.V. "Scotia"

April - May, 1949

"Scotia" set sail from Aberdeen at 12.30 p.m. on 25th April and returned at 10.30 p.m. on 22nd May, during which time the greater part of the scheduled programme was completed.

The departure from the Butt of Lewis, at the commencement of the Hebrides-Faroe leg, was delayed from 26th to 29th April due to the occurrence of a south westerly gale, so that shelter had to be sought in Broad Bay; further gales on reaching Faroe-Bank caused an interruption of seven days before this leg could be completed. During this time the ship sheltered at Vaag, where water was shipped, and at Thorshavn, where 70 tons of coal were taken aboard. At Vaag, the opportunity was taken to visit the master Loran station of the north eastern Atlantic chain.

In view of the time lost at the commencement of the cruise, it was decided, on leaving Thorshavn, to attempt only three of the west Faroe trawl stations and to complete the Hebrides-Faroe leg before proceeding to Iceland. This part of the programme was completed on Monday 9th, and the south coast of Iceland sighted on Tuesday, 10th May. After completing two of/trawl stations off the south coast of Iceland, however, the weather conditions once more deteriorated, and a southerly gale caused an abandonment of trawling operations. It was decided therefore to proceed to Reykjavik, which was reached on Thursday 12th May. Stores and a further 30 tons of coal were shipped at this port.

During the course of a four day stay in Reykjavik, the scientific staff and ships officers were generously entertained by the members of the fishery research department there, and a valuable opportunity was taken to discuss the work being carried out by the two departments.

The ship left Reykjavik on Monday 16th May and, before commencing the Iceland-Hebrides hydrographic section, carried out the remainder of the trawling survey of the Iceland offshore grounds. Strong winds once more interrupted operations during the early stages of the Iceland-Hebrides section, and four of the deepest stations could not be worked. It was possible, however, to complete the line from Lousy Bank to the Sound of Harris before returning to Aberdeen. Continuous echometer traces were obtained during the passage over Lousy and Rosemary Banks.

Hydrography

Temperatures and salinity samples were taken at the standard depths at all stations, and groups of five drift bottles were liberated according to the station profiles. Oxygen and phosphate determinations were made at sea on the two main hydrographic sections.

Surface temperatures were higher to the south than to the north of both the Hebrides-Faroe and Iceland-Hebrides legs. The 9°C isotherm extended to latitude 60°N on both sections, and the 8°C isotherm to approximately the 61°30'N parallel. To the north of this line, surface temperatures ranged between 7.5°C and 8.0°C. On both lines, temperatures were 0.5-0.7°C lower at the shallow coastal stations off the Hebrides than at those over the continental shelf.

Tongues of arctic water, with temperatures between 0°C and -0.5°C were encountered below 500 metres on the Hebrides-Faroe leg to the north and south of Faroe Bank, but at all other stations on this leg, and throughout the Iceland-Hebrides

section, Atlantic conditions were recorded.

Only slight variations in the concentrations of dissolved oxygen were experienced from station to station, but in general the bottom layers (below 400m) contained lower concentrations than near the surface. The maximum and minimum recorded concentrations were 6.75 and 4.49 O_2 /litre at N.T.P. respectively. Phosphate determinations showed a greater concentration at the lower depths than at the surface, with concentrations of up to 1.2 μ .gram atom/litre at depths below 800 m; and down to 0.4 μ .gram atom/litre in the upper layers. The surface concentrations were higher to the north than to the south of the two main sections. At no station was a complete absence of phosphate recorded.

Flankton

Zooplankton sampling was undertaken with the Hensen Vertical net, and with horizontal ~~toy~~ nets (of which two were of coarse stramin, and one of a silk preparation of 26 meshes/inch gauge); phytoplankton sampling was by means of the Standard Fine Silk net.

Hensen collections, throughout the whole area surveyed, were composed chiefly of copepods, of which Calanus firmarchicus and C. hyperboreus were readily identified. The concentrations recorded on the Hebrides-Faroe leg were less dense than those obtained at a slightly later period on previous cruises, thus suggesting that the peak of the summer outcrop of copepods had not been reached. Catches to the north of Faroe-Bank, were markedly poorer than to the south of this point.

Of the two types of townet used, the 1 m. silk, by virtue of its finer mesh, sampled a greater variety of forms than the stramin ones. Copepods, in particular, were caught in large numbers in the silk net, but were not retained by the stramins. In general, catches by the stramin nets were poor at the offshore stations, but fish larvae (mostly gadoid), and local concentrations of Themisto and the Megalopa larvae of ~~decapod~~ crustacea were obtained in the surface and 50 metre nets in the Iceland coastal region.

Deep townet hauls were made with the 1 m. silk at four stations during the cruise, the estimated depth sampled in the four hauls ranging between 500 and 1000 metres. Large copepod collections were obtained, amongst which Calanus firmarchicus, C. hyperboreus, Euchaeta norvegicus, Euchirella spp., Metridia princeps, Rhincalanus and Eucalanus were identified. Specimens of the pelagic fish fauna belonging to the transitional area between the Norwegian Sea and the Atlantic were also taken; these, including Myctophum glaciale (4 specimens), Myctophum punctatus (1 specimen), Argyrolepecus hemigymnus (1 young specimen), Lampanyctes elongatus (1 specimen) and Cyclothone (microdon?) (1 specimen). Larvae of Gadus poutassou, Ling and Argentina were also taken in the Lousy and Rosemary Bank areas. Other forms identified in these catches were Meganyctiphanes norvegicus, Sagitta lyra, S. maximus, S. planktonis, Aglantha, Pelagia perla, Physophora and Tomopteris.

Dense diatom concentrations, consisting principally of Chaetoceros spp. were taken with the Standard net at all stations where it was used.

Trawling

As a result of the unfavourable weather conditions, trawling on the Faroese grounds was restricted to three hauls to the southwest of the islands and two on Faroe-Bank. Catches were poor at each of these stations, and considerable difficulty was experienced in making the trawl fish in the prevailing strong tidal streams and high winds.

Good fishing, however, was experienced on the Iclenad grounds where more favourable weather conditions were encountered. Cod, Ling, Haddock, Sebastes,

Megrim and Witches were the chief species caught. Haddock ranged in size from 16-81 cms, with the mode of the size distribution at 55 cms. Approximately 80% of the total sample was made up by two broods spawned in 1944 and 1945, which suggests that, as in the North Sea, the commercial fishery is based mainly on these two broods. Members of the 1948, 1947 and 1946 broods were very poorly represented in the catches. An examination of the gonads showed that the majority of haddock were ripe and about to spawn. Very few spent fish were encountered. All haddock were feeding actively on mixed diet consisting mainly of crustacea and ophiuroids, and it was found from an examination of the scales, that growth for the current year was already under way.

Scales and otoliths were taken from two samples of Megrims and Witches caught in Icelandic waters, and stomach samples of both species were preserved for subsequent food analysis.

It is worthy of note that fish heads (Cod or Haddock), with decaying flesh still attached, were brought up in the trawl at two Iceland stations and, at one of these, two Haddock were found to have portions of flesh in their stomachs.

B.B. PARRISH.

10th June, 1949.

REPORT ON HEBRIDES - FAROE - ICELAND CRUISE

BY F.R.V. "SCOTIA"

25th April - 22nd May, 1949.

- Aims: (1) Hydrographic and Plankton Surveys of section A of the I.C.E.S. programme, and of a section from south Iceland to the Sound of Harris.
- (2) Trawling Surveys of the western Faroese and southern Iceland grounds.

Hydrography:

Temperatures and water samples were taken at the standard depths and groups of five drift-bottles were liberated at all the scheduled stations. Oxygen and phosphate determinations were also made on the two hydrographic sections.

The temperatures recorded on both hydrographic sections were characteristic of water of Atlantic origin at all depths between the surface and 500 metres, the readings ranging between 7.5°C and 9.5°C, but Arctic Water, at 0° to -0.5°C, was sampled below 500 metres to the south and north of Faroe-Bank on the Hebrides-Faroe leg. On both legs, the surface temperatures increased from north to south, the limits of the 9° and 8° isotherms extending approximately to latitudes 60°N and 61°30'N respectively.

Dissolved oxygen concentrations showed little variation over the whole area surveyed; but in general the bottom layers (below 400 metres) contained lower concentrations than near the surface. Phosphate concentrations tended to be higher to the north than to the south of each section, and were greater below 800 metres than in the upper layers.

Plankton:

Zooplankton samples were taken with the Hensen vertical net from 100 metres, and horizontal townets (two of course stramin and one a silk preparation of 26 meshes/inch) from the surface, 50 metres and 100 metres. Phytoplankton sampling was undertaken from 50 metres with the Standard Fine Silk net. In addition, deep townet hauls were made with the 1 metre silk net at four stations, the depths sampled ranging between 500 and 1000 metres.

Zooplankton samples over the whole area were composed chiefly of copepods, but in no area were they sufficiently dense to indicate that the peak of the summer outcrop had been reached. Catches from the north of Faro-Bank were markedly poorer than those from the south of this point.

The 1 m. silk townet, by virtue of its finer mesh gauge, sampled a larger variety of forms than the stramin ones; copepods, in particular, were retained in greater numbers by this net than with the stramins. The collections of pelagic forms other than copepods were generally poor. The deep townet hauls gave rich mixed samples, containing many copepod species and a number of species of the pelagic fish fauna, characteristic of the transitional area between the Atlantic and the Norwegian Sea.

Dense diatom samples, consisting principally of Chaetoceros spp. were taken with the Standard net over the whole area sampled.

Trawling:

Fishing on the Faroese grounds was restricted, due to adverse weather conditions, to three hauls to the south west of the islands and two on Faro-

Bank. Catches were extremely poor at each of these stations, and considerable difficulty was experienced in working "SCOTIA'S" gear in the prevailing strong tidal streams and high winds.

Nine one-hour hauls were made on the grounds off the south coast of Iceland. Here, good fishing was experienced, the catches consisting principally of Cod, Ling, Haddock, Sebastes, Megrims and Witches. The Haddock population consisted principally of 4 and 5 year old fish, most of which were in a ripe condition with the mode of the total size distribution occurring at 55 cms. It would appear, from the limited survey, that recruitment from the 1946, 1947 and 1948 broods was of a low order, with the commercial fishery based mainly (as in the North Sea) on the broods spawned in 1945 and 1944.

B. B. PARRISH.

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