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# CRUISE REPORT - F.R.S. "SCOTIA".

31st May - 16th June

## NARRATIVE

Leaving Aberdeen at 10 a.m. on 31st May "Scotia" proceeded to the Fladen Ground where continuous observations in connection with productivity studies were made by Mr. Steele over a period of 24 hours. On the completion of this work Mr. Steele and Mr. Knight, of the Macaulay Institute, were landed at Peterhead on 2nd June. The cruise was resumed immediately and shark fishing was carried out on a succession of stations between Kinnaird Head and the north edge of the Viking Bank. Fishing was also carried out by means of great lines and trawl, together with the usual hydrographic and plankton observations. Thereafter a line of stations were worked along latitude 61°30'N to Flugga. Operations west of Shetland were interrupted for one day by a north-east gale and another day was spent in Lerwick paying the crew and obtaining water and bait. The remainder of the haddock larval survey and shark fishing programme were then carried out in rather mixed weather and the vessel returned to Aberdeen on the evening of 16th June.

Six of the 44 haddock larval stations had to be omitted because of heavy seas. The hydrographic and plankton requirements were completed and shark and demersal fishing was carried out satisfactorily, although fishing positions had unfortunately on some occasions to be rearranged and fishing time curtailed in view of the amount of other work on the programme.

## HYDROGRAPHY

Surface temperatures varied throughout the area covered by the cruise from a minimum of 8.7°C at a number of positions immediately to the west of Shetland to a maximum of 11.56°C north and north-east of North Rona. Bottom temperatures were lowest on the Fladen Ground where 5.6°C were recorded. Further north they rose to 7.2° north of the Viking Bank and to over 8° at most of the stations west of Shetland and Orkney. The highest bottom readings, over 9°C, were recorded north and north-east of North Rona. Drift bottles were liberated at a number of positions and in addition to the usual sampling for salinity analysis large samples were collected for more specialised analysis by Dr. Johnston from two positions on the line of stations along latitude 61°30'N.

## PLANKTON

The cruise yielded extremely interesting plankton catches from the point of view of quantity, quality and general distribution. Calanus was the most numerous organism at the majority of the positions sampled. Particularly heavy catches of this animal were obtained from the western edge of the Fladen, the eastern edge of Bressay Bank, north of the Viking Bank, west of Flugga, south-west of Sumburgh Head, and at a number of positions on the grid westwards from Orkney to Sulisker and the Butt of Lewis. Pleurobrachia was also outstanding at many positions, for example, west of the Fladen, west of Shetland, and especially in latitudes 59°48'N and 59°30'N westwards from the Fair Isle. Another feature of the plankton in this area was the rapid change in its composition from one position to the next, 15 miles distant. For example, Calanus was predominant in the statistical rectangle C18a, Pleurobrachia in B18b, Rizosolenia in B18a, medusoids with some Calanus in A18b, Pleurobrachia in A18a and Calanus again in ZZ18b.

Limacina was also found in dense concentrations at some places including the eastern edge of Bressay Bank and at the following positions west of Orkney, 59°30'N - 5°00'W, 59°07'N - 6°00'W and 58°46'N - 7°00'W. The following organisms were also noted in the plankton collections.

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| Turris | East of Bressay Bank and north of Flugga. |
| Aglantha | At two positions north of Flugga and near Sule Skerry. |
| Laodicea | North of the Viking Bank and at two positions on latitude 61°30'N. |
| Medusoids including Cosmetira | West of Orkney. |
| Salps | North of Flugga, west of Rona's Voe and north of Sulisker. |
| Dolioletta | North of Flugga. |
| Physophora | East of Bressay Bank and at two positions on the 61°30'N line. |
| Euphausids | In small numbers at various places. |

Aurelia, although not recorded from any of the plankton collections, was observed in dense concentration while at anchor in Rona's Voe. Young fish were present in most collections although not in great numbers. A sample of "white water" was preserved from 59°48'N - 5°10'W for laboratory examination. On this occasion the water was of a greenish-white colour.

SHARK FISHING

Shark lines were shot at ten positions. From 4 to 6 lines were used on each occasion and allowed to fish for periods ranging from 4 to 12 hours at a time. The gear consisted of 9 lb. lines suspended from floating buoys and dahns, and bearing Norwegian hooks on 3 fm. snoods at 14 fm. intervals. Each line carried 28 hooks. Various modifications in the type of snood were tried out and different kinds of bait were used during the cruise. Although the gear appeared to be suitable in every way and the handling of it by the crew satisfactory, the results were most disappointing. Only one small porbeagle was caught at the position east of Bressay Bank. Large dogfish (Squalus acanthias) were caught in the areas north and west of Flugga and in the North Rona/Sulisker region and a few demersal fish including haddock and cod were also taken. At Flugga a large fleet of Norwegian liners were observed at work. Later it was learned, in conversation with some of the crews at Lerwick, that the Norwegians were fishing with ground lines for dogfish and that porbeagle were not being caught. (It is understood that the dogfish on being landed in Norway are skinned and exported to this country).

The cruise therefore provided no information about the distribution of the porbeagle, except perhaps to emphasise the extreme scarcity of the species in the North Sea and on west Shetland and Orkney grounds at the present time. It was learned in Lerwick that three specimens had been landed by herring drifters since the beginning of the herring season all from south-east of Lerwick.

DEMERSAL FISHING

Trawling was carried out at a number of positions chiefly in an attempt to obtain suitable bait, but the results were poor in each case. The scarcity of haddock and whiting was particularly marked. Great lines were also shot on several occasions with skate, ling and tusk the commonest species taken.

ECHOSOUNDING

This apparatus was employed almost continuously during the first half of the trip until a defect developed and its use was discontinued. Diffuse traces were recorded at a number of places suggestive of the presence of plankton. A typical herring trace extending from 30 to 40 fms. (depth of the water 51 fms.) was obtained at 60°10'N - 2°05'E. As "Scotia" lay at this station 4 Swedish motor trawlers

appeared from over the horizon following a course which took them close to our position. As they passed they suddenly altered course and scattered, then proceeded to shoot their trawls. It was obvious that all four vessels had also located the herring shoal.

GENERAL

Whales appeared rather more numerous then in recent years. The following records were noted.

One east of Bressay Bank on 4th June, three 20'W and one 25'W of Rona's Voe on 9th June, one 30'N of Sule Skerry on 12th June and two near Sule Skerry on the 13th. Porpoises were observed on the Fladen, on the 61°30'N line, north of Sule Skerry and again close to the rock. Basking sharks were noted at several positions south-west from 59°30'N - 5°47'W and again near Sule Skerry.

Three Norwegian vessels, each fitted with a harpoon gun and a crow's nest, were encountered steaming eastwards round Sumburgh Head on 11th June. As basking sharks were not observed in Shetland waters these vessels were probably searching for whales.

During the cruise the following collections were made for scientists in other laboratories.

1. Plankton indicator samples from the area covered on the haddock larvae grid for Mr. Glover of the Leith Laboratory.

2. Thyroid and pituitary glands from Elasmobranchs for Dr. Dodds of the Gatty Laboratory, St. Andrews.

3. Elasmobranch liver samples for analysis by Dr. Fisher of the National Institute for Research in Dairying, Reading.

4. Dogfish for Miss Rose of Gordon's Technical College, Aberdeen.

BENNET B. RAE

28th June, 1955.

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