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Part II

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

North-West Atlantic Survey Part II

5th-23rd August 1954

The chief aims of this cruise were:

- (a) Hydrographic and plankton survey of waters to the west of Scotland and Ireland.
- (b) Great line fishing with the particular object of obtaining halibut for a more detailed study of infestation with the larvae of Grillotia erinaceus.
- (c) An echo sounding survey of western grounds for the location of -
 1. Concentrations of oceanic herring
 2. Scattering layers

The "Scotia" sailed from the Clyde on 5th August and, after some delay on west Irish grounds through bad weather, reached Aberdeen on 23rd August.

Hydrography

At the great-line stations south-west from Stanton Bank along the Irish coast temperatures were remarkably uniform at the surface, ranging from 13.19° to 13.88°C. and at the bottom from 9.28° to 10.15°C. On the long section north-west from the Shannon surface temperatures ranged from 15.16° in the shallow estuary to 13.53° at 17°W. longitude. Generally, surface temperatures were below 14°C. although a slight rise above this figure was recorded at three deep water stations westwards from Porcupine Bank. Bottom temperatures on the coastal banks remained about 10°C. At the six deep water stations (1609 to 2889 metres) bottom temperatures ranged from 2.89°C. to 4.10°C. North-west from 54°28'N 18°00'W to Rockall Bank and eastwards to Barra Head surface temperatures again revealed uniformity in ranging from 13.01° to 13.91°C. On this section bottom temperatures varied according to depth, being in the region of 9°C. on the bank and falling to 3.40°-3.73°C. at the four deep water stations (1829 to 2332 metres).

At selected positions throughout the cruise additional samples of water were taken for analysis of oxygen and phosphate content, and at a limited number of positions tests were carried out on the chlorophyll concentration. Drift bottles were liberated at selected stations. Remarkably clear water was found on the shallower part of Rockall Bank at which point a Secchi disc was visible at a depth of 26 metres. Although clear water is generally considered to indicate poor fishing conditions a good trawl haul consisting mainly of haddocks was obtained at this position just before sunset.

Plankton

Hauls were made with the Standard, Hensen and one-metre horizontal and oblique townets as indicated on the programme. Throughout the cruise salps were a common feature, sometimes in dense concentration. Ctenophores and medusoids were also prominent in the catches at certain points. Copepods were observed to the east and Sagitta to the west of Porcupine Bank. Copepods again appeared at the most westerly station on 18° longitude. West of Barra Head siphonophores were found in a dense concentration of salps together with Aglantha and Beroe. Young fish were present in small numbers at various

places including lemon soles on Rockall Bank. A young specimen of Fierasfer was taken at 53°04'N 12°11'W.

Great Lining and Trawling

Great lines were shot on fourteen occasions during the cruise in four areas: (a) south-west from Stanton Bank along the west Irish coast, mainly outwith the 100 fm. line; (b) on Porcupine Bank; (c) on Rockall Bank from 100-200 fm.; (d) west of Barra Head. Results varied considerably from place to place with the best fishing on Stanton Bank and on the eastern side of Rockall Bank. Ling, tusk, skate and dog-fish were the commonest species. One disappointing feature of this work was the complete absence of halibut from catches on all grounds. This supports the view held by Aberdeen great-line skippers of the scarcity of halibut on north-west Irish grounds in recent years. Very poor fishing was experienced west of Ireland. Various types of bait, including fresh and salted herring, ling and tusk "dollops" and small haddocks were tried during the cruise. The best results were obtained using small haddock but this may have been due to a heavier concentration of fish on the grounds. A limited amount of trawling was carried out but, apart from a good catch of haddock on the east side of Rockall Bank, no quantity of commercial fish was taken by this means. The chief interest in the haul from Porcupine Bank lay in the capture of a number of rare fish including four Capros aper, six Scorpaena dactyloptera and one Arnoglossus imperialis.

Echo Sounding

Echosounding was carried on almost continuously throughout the cruise, and both instruments worked satisfactorily. Some interesting traces were obtained of organisms at varying depths. For example, at 1115 BST on 7th August a double trace was recorded on the Kingfisher at 20/30 fm. and at 45/50 fm. Again between 1800 and 1930 hours on the same date a trace, also visible on the Kingfisher, was seen to rise from a depth of 120 fm. to 25 fm. in 42 minutes. On this occasion the pelagic trawl was shot and hauled at the trace depth for half an hour. No fish were taken but a quantity of macro-plankton was taken which included at least four different organisms - Beroe, the salp Lasis zoneri, Pelagia perla and the siphonophore Hippopodia. Mid-water traces were also observed west of Ireland and on Rockall Bank, the latter resembling fish traces. All records have been preserved for more detailed study ashore.

B. B. Rae
17th September, 1954.

CIRCULATION

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

North-West Atlantic Survey Part II

5th-23rd August 1954

Narrative

After fuelling at Bowling the "Scotia" sailed from the Clyde at 7 p.m. on 5th August. A call was made at Campbeltown the following morning to collect a quantity of fresh herring for bait as previously arranged with Mr. Riach, the Fishery Officer. Mr. R. E. Craig and an engineer from Kelvin and Hughes, who had accompanied the ship from Greenock in order to adjust the new Kingfisher echosounding machine, went ashore at this point. "Scotia" then proceeded to sea and reached the first station on Stanton Bank early next morning. The loss of the fly-wheel from the line hauler threatened to hold up line fishing but an excellent improvisation by the ship's engineers prevented this and the hauler worked satisfactorily throughout the cruise. After a good start the weather deteriorated quickly and late on Sunday night scientific work was suspended and the ship went to anchor in Blacksod Bay. A north-west gale prevented a resumption of duties until the morning of 11th August. In addition to the lining programme two trawl hauls were carried out before the ship entered Fenit (S.W. Ireland) on Friday 13th. After topping up the water tanks "Scotia" left Fenit on Sunday afternoon and commenced the line of hydrographic-plankton stations at the mouth of the Shannon estuary. Good progress was made with a following wind to Porcupine Bank where some fishing was carried out with great-lines and the trawl before resuming the hydro-plankton observations. By this time the weather had again worsened and some delay was experienced by having to dodge on several occasions before the end of the line was reached at $54^{\circ}28'N$ $18^{\circ}00'W$. As it was clear that the programme could not be completed before the scheduled end of the trip it was decided at this point, in order to make the most profitable use of the remaining time, to omit the hydro-biological line to North Ireland and to concentrate on a line along 57° of latitude to Barra Head. Stations, which included fishing with great lines, were therefore worked northwards on to and along the western edge of Rockall Bank. Good weather prevailed during the last few days of the cruise and operations were concluded west of Barra Head on Sunday, 22nd August. "Scotia" arrived in Aberdeen at 8 p.m. on the following day.

Hydrography

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At selected positions throughout the cruise additional samples of water were taken for analysis of oxygen and phosphate content, and at a limited number of positions tests were carried out on the chlorophyll concentration. Drift bottles were liberated at selected stations. Remarkably clear water was found on the shallower part of Rockall Bank at which point a Secchi disc was visible at a depth of 26 metres. Although clear water is generally considered to indicate poor fishing conditions a good trawl haul consisting mainly of haddocks was obtained at this position just before sunset.

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Shark fishing

Following recent reports by Aberdeen fishermen of concentrations of sharks on Rockall Bank it was decided to shoot a short length of floating line carrying twelve hooks for the capture of sharks, while tiding the great lines. This was done on four occasions and resulted in the capture of one blue shark. On Rockall Bank sharks were seen on at least two occasions at the surface and one of these, another blue shark, was caught on a hand line. During the cruise five sharks were caught, three blue sharks and two six-gilled sharks. Although the porbeagle was not represented in the catches this species is known from its capture by commercial liners to be present on the bank. The present records add little to our knowledge of the shark population on the western banks but they do indicate that the economically important porbeagle forms only a fraction of the total shark population.

West Irish Grounds

In view of the recent request to the White Fish Authority by Milfordhaven Trawler Owners for investigation of grounds lying west of the Irish coast to the 100 fm. line, it was decided to observe closely the depth and nature of the bottom while steaming from 52°59'N 11°53'W to Kerry Head (course 114°). From 107 fm. the water gradually shoaled to 75 fm. over a distance of 15 miles. Thereafter shoaling continued slowly to 60 fm. at a position about 25 miles from Kerry Head, from which point shoaling became more rapid as the coast was approached. Up to this point the sea bottom appeared very smooth and flat. Twenty-five miles from Kerry Head a section of rougher bottom intervened for a distance of about seven miles, after which no obstacle appeared on the trace until about six miles from Kerry Head when the bottom again became rougher. On the line of stations running north-west from the Shannon sounding was again carried out and resulted in a repetition of the features already described but in the reverse order. No fish traces were obtained in this area but some less-well-defined traces

appeared to be due to the presence of plankton, of which some rich collections were made near the coast.

Trawl hauls were made at two positions: (a) 52°52'N 11°25'W; (b) 52°44'N 10°55'W. On each occasion the haul was made smoothly with no obstruction or damage to the trawl. Catches were however extremely poor, consisting only of a few megrims, haddock, gurnards and skate. In their poverty the hauls were on a par with the great-line results obtained beyond the 100 fm. line to the westward. No fishing vessels were observed at work in the area east of the 100 fm. line.

Notes were made of the nature of the bottom ^{as ascertained} by means of the lead with the following results:-

	<u>Position</u>	<u>Sounding fathoms</u>	<u>Nature of the bottom</u>
1.	52°50'N 11°23'W	74	Fine shell sand
2.	52°44'N 10°55'W	66	Hard ?rock
3.	52°28'N 9°53'W	15	Hard ?rock
4.	52°40'N 10°40'W	62	Hard ?rock, thin layer of mud
5.	52°52'N 11°25'W	73	Sand and gravel

Fishing vessels

Whilst approaching the first station on Stanton Bank "Scotia" passed through a concentration of trawlers at work. The nationality of these vessels was not ascertained in the darkness. On the following forenoon, about 20 miles SSW of the Stanton Bank position, another fleet of trawlers was encountered. At least ten of these vessels appeared to be Spanish while two only were English. Smaller than the British trawlers, the Spanish vessels were motor driven and all were of similar design with high bows. The Spaniards appeared to be using the Pareja net.

Steaming south just outside the 100 fm. line another Spanish pair was seen working west of Achill Head on the 11th. Two pairs were noted to the westward at Station 53°30'N 11°30'W and two pairs west of Slyne Head on the 12th. On 16th two more Spanish vessels were seen in company with two English trawlers on the eastern side of Porcupine Bank. It is presumed that all the vessels observed were fishing for hake.

Echo Sounding

Echosounding was carried on almost continuously throughout the cruise, and both instruments worked satisfactorily. Some interesting traces were obtained of organisms at varying depths. For example, at 1115 BST on 7th August a double trace was recorded on the Kingfisher at 20/30 fm. and at 45/50 fm. Again between 1800 and 1930 hours on the same date a trace, also visible on the Kingfisher, was seen to rise from a depth of 120 fm. to 25 fm. in 42 minutes. On this occasion the pelagic trawl was shot and hauled at the trace depth for half an hour. No fish were taken but a quantity of macro-plankton was taken which included at least four different organisms - Beroe, the salp Iasis zoneri, Pelagia perla and the siphonophore Hippopodia. Mid-water traces were also observed west of Ireland and on Rockall Bank, the latter resembling fish traces. All records have been preserved for more detailed study ashore.

General

Porpoises were seen at a number of positions west of Ireland and a school of about 100 caa'ing or pilot whales, Globicephala melaena, remained for some time by the ship on Rockall Bank on 20th August.

Samples of livers from twelve different species of sharks, dog-fishes and skate were preserved in alcohol for analysis of vitamin "A" and fat content by Mr. Fisher of the National Institute for Research in Dairying at Reading.

BENNET B. RAE
1st September 1954

CIRCULATION:

Mr. W. K. Rose
Mr. M. Graham
Captain E. A. Bruce
Dr. C. E. Lucas

Mr. G. S. Gault, W.F.A.
Mr. T. C. Jones, W.F.A.
Dr. B. B. Rae
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