

CRUISE REPORT

F.R.S. "SCOTIA"

September 2-17, 1965

General

"Scotia" left Aberdeen at 7 p.m. on 2nd September to commence working the North Sea survey. In view of the plan to meet "Anton Dohrn" later in the cruise, preferably in the southern part of the area to be surveyed, we decided to work from the south towards the north so that results from the northern stations could be compared with already known results further south. After completing 64 stations the weather deteriorated and we took advantage of a night in the shelter of Shapinsay on Wednesday 8th to work up the results to date. This was followed by a day in Kirkwall for stores and water and yet one more night in the lee of Shapinsay.

Dense echotraces were found approaching and at the anchorage and we investigated these by experiments with lights over the ship's rail. The evidence pointed strongly to salps as the cause. The lights in no way affected the position of the echoes and the only fish seen was one small sandeel. Salps, however, were very abundant and patches of their chains could be seen in the beam of the lamp.

Work continued from 7 a.m. on Saturday the 11th in good weather. As we had already lost two days we had to omit some of the work and decided to complete the work east of Orkney and in the Fair Isle area, omitting only the most northerly section west of Shetland, but giving a good although incomplete coverage west of Orkney. "Scotia" then proceeded southwards towards the area where we expected to investigate thoroughly a patch of herring larvae prior to meeting the "Anton Dohrn".

A number of stations in the most likely area were repeated and the survey extended both to the east, north of 58°W, and to the south as far as 56°15'. Radio communication was established with "Clupea" on the 14th and 16th, with "Anton Dohrn" on the 16th and 17th, and with the laboratory on 14th and 17th, but no dense concentrations were located.

On Friday the 17th a severe gale was forecast, "Anton Dohrn" was in fact unable to rendezvous as planned and as we had only one day's fuel supply it was necessary to return to Aberdeen on the tide of Friday night. Co-operative work had thus to be abandoned but as "Anton Dohrn" put into Aberdeen later we were able to have a thorough discussion and pass the necessary data to them so that they could continue the survey.

Results

1) Herring larvae: The southern section on the outward part of the cruise was disappointing; only a few herring larvae were found (1-30 per haul) but mostly large (17-23 mm in length) and not the abundance of newly hatched larvae hoped for. East of Buchan herring larvae were even scarcer although some were taken at most stations to the east of the Moray Firth and on Fladen. A denser patch, but only reaching 60 per haul, was found off the Caithness coast and up to 170 per haul close to the east coast of Orkney. A really dense patch, approximately 1200, was located west of Fair Isle and consisted of very young larval Clupeoids with some empty herring egg shells. West of Orkney the numbers of larvae were again reduced but reached 20 to 120.

Contact with "Clupea" revealed no patches located east of the Tay and Forth areas, and it seemed hopeful that hatching of larvae would be late, so that a fresh search for a patch might find some in areas where none had been found two weeks earlier. It was not considered practicable to work the Fair Isle patch as fuel supplies were low and the very large patch could not

readily be delineated. Time in this area would have been too short for working with "Anton Dohrn".

The repetition of stations to the south and the extension of the area showed that young herring larvae were still very scarce indeed, and only in one area, 56°56'N, 1°15'W, were they found and then only in rather inadequate numbers of about 120 per sample. "Anton Dohrn" was told of this and undertook after leaving Aberdeen to re-investigate this patch; if it was still unsuitable she would continue northwards to work on the Fair Isle patch.

### Plankton

The most noticeable feature of the plankton was the dense quantities of salps taken over a wide area, densest to the east of Fair Isle in the area west of 130° west, east of Orkney and Pentland. There were lesser numbers, although salps were still abundant, west of Orkney, in the Moray Firth and on Fladen. Repeat stations east of Aberdeenshire showed a distinct increase in the numbers of salps after two weeks and Radiolaria were abundant there. To the east of 1°30'W, east of Orkney, salps were absent and Calanus was extremely abundant. East of Aberdeenshire plankton was rich in Calanus with small quantities of *S. elegans* and Euphausiids. Fish larvae other than herring were also abundant at many stations. Gulf III samples totalled 147.

### Drift markers

Drift markers, indicators and drift bottles were liberated at all the stations as instructed.

### Echosounding

The echosounder was kept running throughout the cruise and gave no trouble. This instrument is a sensitive model and there seems little doubt that dense salps were the cause of a very large proportion of the echoes.

### Trawling

Two trawl hauls were made with the prawn trawl in the Moray Firth, the first at 57°55'N, 2°59'W, took 355 Nephrops of which 43 were berried, but on the second haul at 57°48'N, 3°20'W only a single Nephrops was caught. Neither haul gave many fish of commercial value.

### Hydrography and Chemistry

Samples were taken according to the instructions.

### Other investigations

A sample of phytoplankton preserved in alcohol for Mrs. Reid and another sample preserved in Carriker's solution was taken for mollusc larvae for Dr. Ockleman. The depth flowmeter was recalibrated before returning to Aberdeen.

J. H. FRASER  
28th September, 1965