

MINISTRY OF AGRICULTURE, FISHERIES AND FOOD
FISHERIES LABORATORY, LOWESTOFT, SUFFOLK, ENGLAND

1972 RESEARCH VESSEL PROGRAMME

REPORT: RV CIROLANA: CRUISE 5

(PROVISIONAL: Not to be quoted without prior reference to author)

STAFF

G C Trout
L Birkett
R R Dickson
P Scholes
G C Baxter
Mrs A Houghton
Miss H Summer
N E Platt (IMER)
B O Meggett (Grimsby)
M Duggan
R Tuthill (S G Brown Ltd. - to Aberdeen only)

DURATION

Left Grimsby 1016 h 19 May

Arrived Yarmouth 0241 h 16 June

All times are Greenwich Mean Time

LOCALITY

N. Norwegian Coast; Bear Island; Barents Sea; North Sea

AIMS

1. To begin a study of the seasonal vertical distribution of gadoids in the Barents Sea.
2. To investigate light levels and temperature conditions at the depth of shoals found.
3. To collect ultra plankton for culturing.
4. To begin to monitor the distribution of ultra plankton species in the Barents Sea.
5. To continue investigations on cod flesh parasites.
6. To release two buoyed parachute drogues on the shelf at 64° and 66°N at 1000 and 800 metres for tracking by satellite.
7. To work the Malangen Section.
8. To moor four current meter stations along the North Cape/Bear Island Section and recover them on the homeward passage.

9. To work the West Bear Island Section.
10. To service JONSIS stations in the North Sea on the passage to Grimsby.

NARRATIVE

Anti-roll stabilising tank trials were carried out by Dr Lewison of NPL Ship Division, at the mouth of the Humber. A four man film team covered NPL's work on board and finally filmed the effects of the trials from a tug nearby. After dropping the NPL party, by tug, CIROLANA sailed at 1016 h 19 May and Mr Tuthill left the ship by pilot boat at Aberdeen at 1443 h 20 May.

Course was then set for the drogue station positions at the edge of the Norwegian Shelf in 64°N and 66°N and thence to the Malangen Hydrographic Section - this was extended to 71°50'N 05°00'E. A line of XBTs was run thence to the westernmost station of the W. Bear Island Section and the section completed at 1530 h 27 May. Scattered ice floes were encountered on the shelf and lay on both sides of the Island stretching northwards. Increasing winds made it necessary for the ship to dodge during the 27 and 28 May, keeping just clear of the ice, until conditions were suitable for current meter buoy laying on the 29th. Four stations were laid at selected positions along the South Bear Island Section and the work was completed at 1030 h 30 May.

Fishing began at 1600 h 30 May - on some promising echotraces - in 400 metres off Nordkyn with the Engel 576 midwater trawl. The first haul was made without the headline transducer, in order to discover any handling snags and to give the crew practice with the new net. A warp length/net depth calibration curve was then obtained and fishing continued in the Kildin and East Bank areas until the morning of 6 June.

The South Bear Island Section was then begun at 0905 h and completed at 1040 h 7 June. All four buoy stations were observed to be in place along the Section.

An echo survey between the last few hydrographic section stations and during a small diversion, made to check that the Norwegian moored buoy was on station, revealed no traces likely to be cod. Nor were any seen when approaching or at the SW Gully. Traces which appeared to be of small fish were seen and one haul made before the weather deteriorated and the ship was dodged for three days whilst waiting for conditions suitable for lifting the buoyed current meter stations.

By 1000 h 10 June the swell had decreased sufficiently for the four stations to be recovered by 0639 h 11 June when course was set for JONSIS Station C. This position was reached at 2030 h 14 June and the meters lifted. Station B - reported drifting 25 miles S - was found on station, lifted and replaced by 0938 h 15 June. Station A was exchanged and all work completed at 1540 h and course set for Yarmouth, where the vessel berthed at 0241 h 16 June for off-loading all gear, food, fish and personnel and before she sailed for dry docking at Immingham.

RESULTS

Aim 1. The midwater trawl was handled smoothly and confidently by the crew throughout the short fishing period. Fishing was light however and maximum catches were of 10 and 15 baskets. A total of 28 hauls of one hour, for the most part, did not allow any conclusive evidence to be obtained on the depth of the maximum concentration of cod/haddock in the water column but the heaviest catches were in the 80-160 m level over 300-400 metres irrespective of time of day.

Both species were present, however, at all depths fished; from 20/30 metres -

the nearest to the surface which it was thought practicable to fish - down to near bottom in over 400 metres. Difficulties were experienced with the headline transducer cable and although conductor continuity was satisfactory with the transducer on deck, it failed to operate when under tension. Thus no certainty existed of sampling the depths at which the traces occurred, although the Elac Sonar gave reasonable help at up to about 600 metres range. Fishing close to the bottom was too risky when depending on the Elac alone, especially in an area where tide and permanent 'set' could be in opposition. Under these conditions the trawl weights touched bottom on three, possibly four, occasions but no damage to the net resulted.

Depth changes, deduced from sounder records during the 24 hours (on five days of continuous bright sunlight) appeared small for cod and differed somewhat on each ground. Capelin traces appeared to be more variable in depth, whilst an extensive mist like trace, some 30 metres thick, rose to the surface during the 'darkest' part of the night. Euphausids were meshed in the trawl, found in cod and in capelin stomachs taken from the depth of the trace, and the trace was assumed to have been due to a continuous swarm of euphausids.

Individual cod traces were seen to dive some 40 metres in 5.5 mins and about 85 metres in 12 minutes - no allowance included for effect of beam width as the ship drifted over them.

Cod caught during the shallower hauls contained freshly taken capelin. Those caught at greater depths contained well digested capelin. Some method - for example, a parachute drogue and surface buoy - is needed to enable the ship to remain in the vicinity of a particular echo concentration.

Otoliths and length measurements were taken from each area fished.

Aim 2. A component within the photometer display unit failed whilst it was in use on the first lowering and could not be repaired. This aim was abandoned but XBTs were lowered at each ground. No thermocline was observed.

Aims 3 & 4. Ultra plankton samples were collected for identification and culturing throughout the cruise.

Estimation of chlorophyll 'A' by means of a continuously sampling Fluorometer was also carried out, whilst on passage and on each new ground visited.

Aim 5. 121 cod from mid water hauls were examined for the presence of Porocaeum decipiens larvae and Anisakis sp larvae in their flesh. Some 9.9% cod were infected with Porocaeum - a mean of 0.26 per fish, whilst 96.7% were infected with Anisakis, a mean of 9.58 of the latter per cod.

Viscera of 25 cod taken off Nordkyn were returned to the laboratory for examination of their nematode fauna.

Aim 6. The two parachute drogues with transponding surface buoys were released on 22 May as planned - the buoys themselves proving very stable and taking up a vertical position. Subsequent tracking by satellite has indicated a net movement of 45 miles southwest in approximately 15 days for the deeper (1000 m) drogue. Movement of the other buoy appeared to be less consistent.

Aims 7, 8 & 9. The three hydrographic sections were completed under nearly ideal conditions. Data from the four buoyed current meter stations, laid on 29 & 30 May and recovered 10 & 11 June were intended for comparison with the geostrophic velocities derived from the south section, carried out on 6 & 7 June.

All 12 meters were recovered but the station nearest the Norwegian coast had been fouled - probably by a trawler - and one meter had ceased to function and one

weight was lost. The remaining meters had operated satisfactorily.

Aim 10. JONSIS Station C was reached at 2030 h 14 June, lifted and withdrawn. The B and A stations were serviced as required on 15 June using the trawl winch and the after deck working position.

Miscellaneous.

- a. Electro-physiological studies on the pineal gland of whole cod were carried out by Mr Duggan in the Belling & Lee shielded cubicle in which a refrigerated and recirculating salt water supply had been arranged. Results must await analysis of filmed records of response of the pineal to stimulation by light.
- b. Routine weather observations were made and reported and the surface thermometer run throughout the cruise.
- c. Approximately 12-14 cwts of capelin were quick frozen for fish food.
- d. The midwater trawl towed by a French stern trawler - one of an international fleet of over 40 vessels fishing off N. Cape - was used for sonar and sounder target practice. Fishing there was reported as light with 15 baskets for $7\frac{1}{2}$ hours and the fleet dispersed after a few hours.
- e. Making a sinusoidal course by systematic and rapid changes of helm, Dr Lewison was able to make CIROLANA roll from 12° to 15° during the stabiliser trials, with an empty tank. This figuring was not exceeded during the whole cruise.
- f. Sperm from one Long Rough Dab was returned to the laboratory for Dr Purdom.
- g. The fish caught by the Engel trawl were all lively and in excellent condition when released from the codend.

G C Trout
20 June 1972

SEEN IN DRAFT: James E M Balfour (Master)

W J Saxby (Fishing Skipper)

INITIALLED: AJL

DISTRIBUTION:

Basic List

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L Birkett
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