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

1971 RESEARCH VESSEL PROGRAMME

REPORT: RV CIROLANA: CRUISE 5

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

STAFF

D J Garrod
B W Jones
T Williams
D Ellett
J G Pope
S Flatman
B Knights
R Perkins (Hull)
N Matthews (Sandwich student)
J Clipper (Visitor)

DURATION

Left Grimsby 1800 hours, 9 June

Arrived Immingham 1700 hours, 24 June

All times are British Standard Time

LOCALITY

Faroes

AIMS

1. Intensive groundfish survey of Faroe Bank to assess the accuracy and logistics of research vessel surveys as a method for measuring stock abundance.

2. To test the TSD probe data logging system.

3. Fishing trials with the Boothbay frame net.

4. To collect material for:-

   (i) cod blood-type studies (Dr Jamieson)

   (ii) studies of the maturation of halibut grounds (Dr Purdom)

   (iii) pineal studies (Mr Bye)

   (iv) NERC Fish Helminthology Unit

NARRATIVE

RV CIROLANA sailed at 1800 hours, 9 June, and commenced the groundfish survey on Faroe Bank at 1200 hours, 11 June, having carried out one hydrographic station en route. The survey itself was divided in two

replicate series of stations covering the bank above 200 fathoms, each replicate composed of 32 stations selected at random within specified quadrants and depth strata. By fishing round the clock RV CIROLANA averaged 7 hauls per day so the first replicate was completed by 2400 hours, 15 June. We then took one rest day in Thorshavn and resumed the programme at 0145 hours, 17 June with a hydrographic station and limited echo survey of sea bed topography in deep water south of Faroe Bank on the Wyville-Thomson ridge. The second phase of the groundfish survey commenced at 1300 hours, 17 June, and was completed at 1800 hours, 21 June. RV CIROLANA then returned to the hydrographic station on the Wyville-Thomson ridge to repeat previously unsuccessful observations of bottom temperature and salinity. Once this was accomplished RV CIROLANA returned to Faroe Bank to test the technique for fishing the Boothbay frame net in preparation for Cruises 6 and 7, and to sample 0-group fish in the pelagic scattering layer over Faroe Bank.

Material referred to under aim 4 was collected throughout the groundfish survey as the opportunity arose.

All scientific work was completed at 2130 hours, 22 June. RV CIROLANA docked at Immingham at 1700 hours, 24 June.

RESULTS

1. The total groundfish survey of 64 stations was accomplished in 9 days, largely through the smooth running of the fishing operations on the 24 hour basis and the fair weather conditions which persisted throughout the cruise. Loss of time through gear damage was less than expected for this area and in fact clear tows were obtained in the vicinity of all the selected stations even though many were located in areas traditionally considered to be extremely catchy.

Since the survey was intended to cover all groundfish species the codends were fitted with a shrimp net blinder retaining fish down to 10 cm length. Rigged in this way catches averaged 5-10 baskets per one hour tow, the standard duration of each haul. The catch level was very consistent in all areas though there were marked changed in species composition with depth. Coalfish predominated in most catches.

The survey was statistically designed to provide replicate series of randomly chosen stations stratified by time, depth and area. The total catch of each species was weighed. All fish caught were measured either directly or by sub-sampling and the composition of catches of cod, haddock and lemon soles were further stratified by sampling otoliths for age composition. The results are thus in a form suitable for analysis of variance that will specify the precision that can be achieved for a given sampling intensity in a fishing area of the Faroe Bank type.

This objective was completely successful in providing the data required for analysis and for a firm assessment of the workload of all staff participating in the fishing operation and analysis of the catches.

2. Hydrography

Water temperatures at the surface was recorded throughout the surveys; bottom temperature, salinity samples and bathythermograph lowerings were made at each trawl station.

(i) Surface temperature varied between 9°-10°C on both surveys. The only unusual feature observed was the rapid fluctuation of the order of 0.5°C which occurred on a calm sunny afternoon (20 June).

(ii) Bottom temperature varied only with the depth of water, from 9°C over the crest of the bank to 8.5°C at depths greater than 250 m. Three stations in the northeast quadrant showed a 0.7°-0.8°C departure from the general temperature/depth correlation during the first survey. This may reflect the influence of Norwegian Sea water at depth in the adjoining Faroe Bank channel. At the time of the second survey, bottom temperature over much of the Bank within the 200 m isobath had warmed about 0.2°C but deeper temperatures appeared to be little changed.

(iii) Bathythermograph observations during the first survey showed a shallow (< 30 m) weak thermocline over the crest of the Bank, deepening to 50 m on the western edge and 60-70 m to the southeast. Strong winds immediately before the second survey led to the disappearance of the mixed layer and the observed rise in bottom temperature over the shallower part of the bank, though the thermocline persisted at 50 m or below over the western and southeastern edges.

(iv) Tests of the TSD recorder data-logging system to assess the efficiency of sampling rates were only of limited success owing to failure of one of three digital counters before the first lowering. Test tapes were obtained for two parameters. The first lowering on 11 June was terminated when corroded winch guiding on gear sized. Subsequent lowerings on 17 June were limited in depth by the large wire angles experienced in moderate wind strength, a fully functioning bow propeller being essential to the safe use of this equipment under such conditions.

(v) Deep bottom water observations were made immediately west of the Wyville-Thomson Ridge between it and a second parallel ridge indicated by GEBCO bathymetric charts. These show a basis between the ridges which seemed a possible trap for Norwegian Sea water overflowing the Wyville-Thomson Ridge. Large wire angles prevented successful sampling at the first attempt (17 June) but a limited echo survey was completed to confirm the bottom topography. Bottom samples were obtained on 22 June showing temperatures of 5.65°C and 4.74°C at 868 m and 885 m respectively. These suggest the presence of Norwegian Sea overflow water but confirmation must await salinity determinations.

3. Trials with the Boothbay frame net and acoustic link depth telemeter were satisfactory and gave reasonable catches of 0-group fish. A number of modifications to the fishing rig to make for easier net control will be put in hand.

4. The material listed under Aim 4 was collected.

D J Garrod

30 June 1971

SEEN IN DRAFT: J E M Balfour (Master)
G W Argumont (Fishing Skipper)

INITIALLED: AJL

DISTRIBUTION

Basic List

Mr Garrod
Mr B W Jones
Mr Williams
Mr Ellett
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Mr Matthews (Sandwich student)
Mr Clipper (Visitor)