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

1977 RESEARCH VESSEL PROGRAMME

REPORT: RV CIROLANA: CRUISE 6/77

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

STAFF

J Bridger
A Child
R Turner
M Macdonald
D Snowball
Mrs W Dawson
Miss A Burgess
D Conway (IMER)

DURATION

Left Grimsby 1530h 31 May
Arrived Grimsby 1730h 15 June
All times are Greenwich Mean Time

LOCALITY

Bay of Biscay, Celtic Sea, Porcupine Bank.

AIMS

1. To carry out a mackerel egg and larval survey.

2. To study the vertical distribution of mackerel eggs and larvae.

3. To identify fish concentrations by trawling.

4. To collect blood and tissue samples from I-group fish for biochemical analysis.

5. To collect deep-frozen specimens of all fish caught for fish identification courses.

6. To bring fertilized mackerel eggs to the Laboratory for rearing experiments.

7. To collect hearts from any large fish caught.

Note: The study of developing scad eggs and larvae, shown on the ship's programme as Aim 4 was achieved on Cruise 5.

NARRATIVE

RV CIROLANA cleared the dock at 1535h 31 May and proceeded via the English Channel to the first station off Belle Isle. On passage the Continuous Plankton Recorder (CPR) was streamed and towed from the eastern end of the Hurd Deep to the first station with the exception of a short spell while the flowmeters of the high speed plankton sampler (TTN) were being calibrated.

The first station (Rectangle 39) began at 2217h 2 June and the last station of the grid proper (Rectangle 177) was completed at 0215h 12 June.

During this period 25 hours work were lost due to bad weather the vessel being forced to 'dodge' from 1535h 6 June to 0534h 7 June and again from 1900h 10 June until 0550h 11 June. A total of 70 TTN stations were successfully completed and a further 8 made at about 60 mile intervals on the homeward passage between Porcupine Bank and Orkney.

Clogging of the net by dense phytoplankton gave rise to serious problems. Nine hauls resulted in mean flow-meter revolutions of less than 1 per second (normally 1.4 - 1.6) and on 6 of these hauls the net was taken to less than the normal 100m depth since at 30-50m depth the flow rate fell to almost nothing. To the south of Ushant having hosed the net thoroughly for ten minutes, then scrubbed it with a stiff brush and hosed it again the net was frequently still so clogged that it had to be removed and scrubbed in hot water and detergent before it could be used again.

The volume of plankton taken was quite exceptional. 14 hauls needed a 7lb jar to contain the catch and a further 19 catches had each to be stored in two 4lb jars. The average catch on this cruise from a TTN haul down to 100m and back produced six 1lb jars half filled with plankton.

The time lost due to bad weather necessitated cutting out about 8 stations over Porcupine Bank. This was particularly unfortunate since both mackerel-type echo traces and eggs were more abundant in the stations carried out to the east of this bank than almost anywhere else in the area surveyed.

The CPR was towed between TTN stations throughout the grid, a distance of some 1600 miles plus a further 750 miles on passage.

Seven hauls were made with the Longhurst-Hardy Plankton Recorder (LHPR) to study the vertical distribution of mackerel eggs and larvae.

The environmental monitoring system was run continuously throughout the grid and also for much of the homeward passage. Chlorophyll extractions were carried out on board.

The location of mackerel shoals by echo sounding was made somewhat difficult due to the fact thet the fish were very dispersed and often hidden in very extensive plankton traces. By night the mackerel occurred as single fish in the mushy traces near the surface while by day they were scattered near the sea-bed among the scads, blue whiting and other species. At dawn and dusk flecks and very small plumes were seen in mid-water and, although not positively identified, the distribution of such traces were highly correlated with the number of eggs of 1-1.2mm diameter and assumed to be mackerel in the plankton. Except for these two short periods each day mackerel fishing at this season would seem to be a matter of straining a lot of water whenever extensive but very light layer traces are recorded in the hope that they contain some mackerel.

Fishing activity was limited by the absence of good fish traces, by poor weather and by the fact that many of the more promising shoals lay too close to trans-atlantic telephone cables to be safely fishable. In all three hauls were made with the Granton trawl in rectangles 68, 96 and 149. A single shot with the Engel pelagic trawl was aborted and the net badly damaged when the skipper was forced to make a drastic alteration in course to avoid collision with a Spanish vessel.

Only three Russian vessels were sighted during the cruise, all in rectangle 123. Two appeared to be echo searching and the third shot a very large pelagic trawl on a very faint near-bottom layer very similar to one we had previously fished and shown to consist mainly of scads with a small percentage of mackerel.

Because of the large number of mackerel type traces and eggs found at the most northerly stations and the fact that the northern route to Grimsby was only marginally longer, it was decided to return 'northabout' and to carry out a number of TTN hauls enroute in an attempt to find the northern limit of the mackerel in June. In the event both traces and eggs fell to very low levels northward of 54°N. After a slow start due to strong head winds the vessel made good time on the homeward passage docking at Grimsby at 1730h 15 June.

RESULTS

The cruise track, together with the positions of the 70 TTN stations, 7 LHPR and 3 Granton hauls, is given in Fig 1. In Fig 2 estimates of the number of eggs caught at each station of 1-1.2mm diameter, and so assumed to be mainly of mackerel are given. Almost all the high catches occurred close to the 100 fathom contour. No big catches were made south of 48°N in the eastern part of the Celtic Sea, or north of 54°N.

The three Granton hauls produced 1, 70 and 361 mackerel respectively implying a marked increase in abundance in the north of the surveyed area. All the mackerel were measured, two biological samples of 70 and 109 fish were carried out and 59 ovaries were pickled in Gilson's fluid for fecundity estimates. The vast majority of these mackerel had not yet spawned being in maturity stages IV, V or V/VI. Three samples of hake, blue whiting and scad and one sample of greater silver smelt and Red sea bream were also measured.

In the last haul on 10 June 2 fully ripe females and 2 males were found in the catch and an artificial fertilization carried out. The fertilized eggs were then put in a number of tubes in the controlled temperature block covering the range 8-13°C. On 12 and 13 June dead eggs were removed and at the time of writing the majority of these eggs appear to be developing normally.

One of the 3 Granton hauls (ST 15: Rectangle 68) was made in 170 fms at the head of a canyon in the continental slope SW of the Great Sole Bank with the secondary aim of locating a deep water lobster stock at the request of Mr A Howard of Burnham on Crouch. The catch included 1½ baskets of squat lobsters, somedeepwater species including Chimaera monstrosa and Malacocephalus laevis but no lobsters.

22 different species of fish were deep frozen for fish identification courses these were:

Common Species	Less Common Species
Hake	Phycis blenoides
Haddock	Helicolenus dactylopterus
Blue Whiting	Lepidorhombus boscii
Norway Pout	Chimaera monstrosa
Spanish Ling	Malacocephalus laevis
Red Sea Bream	Benyx splendens
Megrim	Gadiculus angenteus thori
Witch	Callionymus maculatus
Lemon Sole	Capros aper
LR Dab	Argentina silus
Solenette	Gaidropsaurus vulgaris
Horse mackerel	

A small number of hearts were collected from the larger fish caught, coley, hake and cod.

Several small samples of I-gp gadoids were taken for tissue analysis.

J P Bridger
21 June 1977

SEEN IN DRAFT: T H Finn
W J Saxby

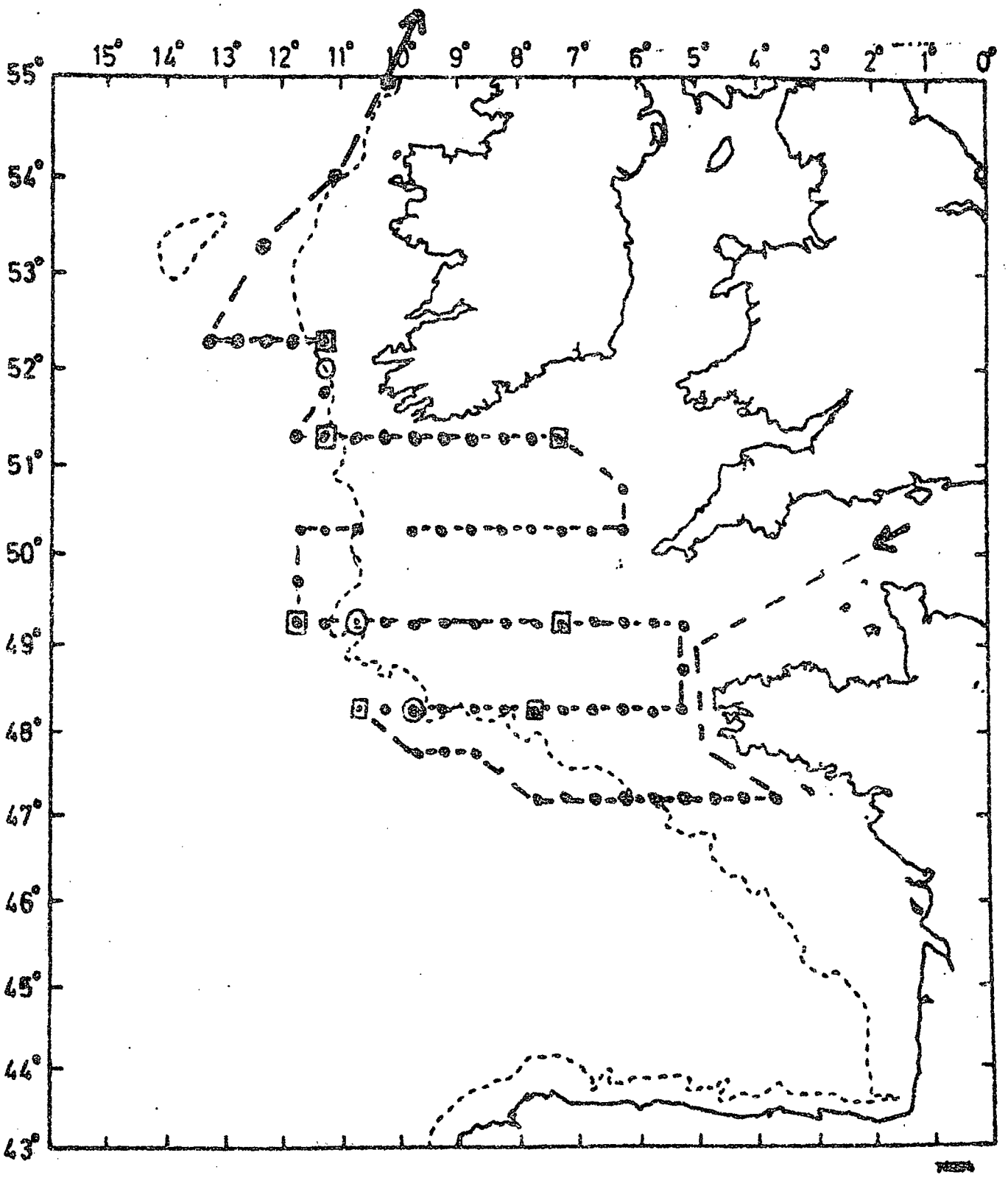
INITIALLED: AJL

DISTRIBUTION:

Basic List
J Bridger
A Child
R Turner
Mrs Dawson
Miss Burgess

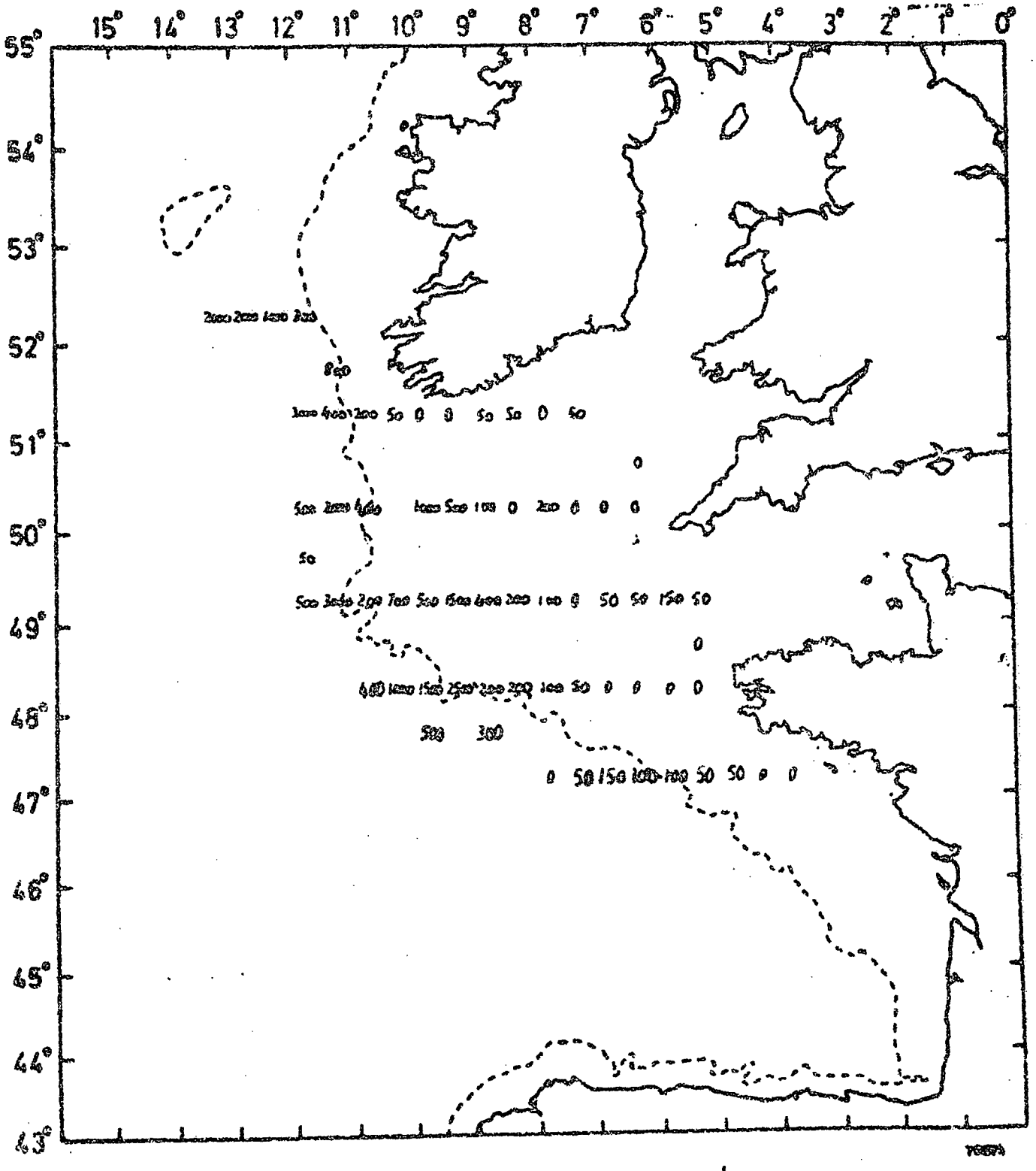
Mr D Snowball - North Shields
Mr M Macdonald - Folkestone
Mr D Conway) IMER
Mr S Coombs)
Mr A Howard - Burnham on Crouch

FIG 1. CRUISE TRACK RV CIROLANA 6/77



• TTN
○ Trawl
□ LHPR
– – C.P.R.

FIG 2. R.V. CIROLANA 6/77



Approximate numbers of eggs probably mackerel.