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FISHERIES LABORATORY, LOWESTOFT, SUFFOLK, ENGLAND

1975 RESEARCH VESSEL PROGRAMME

REPORT: RV CIROLANA: CRUISE 9

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

STAFF

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N B Price, C Chaplin — Geology Department, University of Edinburgh
J M Hardie — Meteorological Office (25 September-14 October)
A Fiuza, M Cunha — Geophysical Institute, Lisbon (14-17 October)

DURATION

Left Grimsby 0730h 25 September

Arrived Grimsby 0730h 23 October

All times are Greenwich Mean Time

LOCALITY

North Sea: Eastern North Atlantic, (W Europe - Azores): Straits of Gibraltar.

AIMS

1. To survey the distribution of selected dissolved and particulate trace metals in the water of the eastern North Atlantic between W. Europe and the Azores. Nutrient salts and dissolved oxygen to be measured on trace metal sampling stations.

2. To collect hake for the analysis of selected pollutants from the Azores and off the Portuguese and Spanish coasts.

The above two aims are related to the activities of the ICES Working Group on Pollution Baseline and Monitoring Studies in the Oslo Commission and ICNAF areas.

3. The deployment of three free drifting data recording buoys (TWERLE) west of Ireland for tracking by satellite.

4. To lay a moored current meter station off the mouth of the River Tyne.

5. To collect water samples for the analysis of radioactive caesium.

NARRATIVE

After sailing from Grimsby the vessel proceeded to a position 8 n.m NW of the mouth of the River Tyne where a moored Plessy current meter rig was laid between 1700h and 1900h 25 September. A hydrographic water bottle cast was made in the vicinity of the meter rig.

CIROLANA then proceeded to the Rockall Channel via the north of Scotland and reached the first deep water hydrographic station at 1900h 27 September. Samples were collected through the water column for the analysis of those constituents listed under Aim 1. CIROLANA subsequently continued south westwards to the Twerle buoy release position, but progress during 28 September was delayed owing to bad weather. The first station was reached at 1310h 29 September and two buoys with parachute drogues at 50 and 350 m were successfully released. Course was then set for the second release position. However, deployment was delayed until the afternoon of 30 September, by which time the force 7-8 winds experienced the previous night had moderated somewhat. The buoy (bearing a thermistor chain) was released at 1419h but its aerial struck the side of the vessel after release and the unit ceased transmitting. The buoy was subsequently recovered but the damage was too extensive to permit on site repair.

CIROLANA then continued in a south westwards direction down the Mid Atlantic Ridge working hydrographic stations on and to the side of the ridge. The southern most part of this section was reached at 1230h 5 October at a station worked during the FAMOUS (French-American Mid-Ocean Undersea Study) expedition.

Course was then set for the region of the Azores and an echo survey of Princess Alice Bank was made during the morning of 6 October to find an area suitable for trawling. The trawl was shot in 300 m during the afternoon of the same day but almost immediately came fast. The main net was extensively torn although the cover contained approximately $\frac{1}{2}$ basket of scabbard fish. The vessel then proceeded to a bank south of San Miguel where a hydrographic station was worked during the morning of 7 October. An echo survey was made of the bank but no suitable trawling ground was apparent. Work then commenced on the Azores-Straits of Gibraltar hydrographic section, approximately one station being worked per day. The Straits were reached during the early morning of 12 October and one hydrographic station was worked in the eastern Mediterranean at 0630h approximately 6 n.m. SE of Gibraltar. Another location was sampled on the sill at 1230h. Course was then set for Lisbon and the vessel arrived at 1215h the following day.

During the afternoon of 13 October Portuguese hydrographic staff visited CIROLANA to discuss details of the joint survey to follow. During the morning of the next day several staff from the University and the Government Fisheries Department toured the vessel and at lunch time a reception was held on board for Portuguese marine scientists. Discussion with fisheries experts indicated the best hake fishing grounds to be relatively close inshore. The Office of the Secretary of State for Fisheries therefore kindly granted permission for CIROLANA to fish within Portuguese territorial waters during the period of the investigation.

The vessel departed from Lisbon at 1600h 14 October with Dr Fiuza and Mr Cunha of the Geophysical Institute, University of Lisbon, on board. At 1815h a coastal hydrographic survey was commenced, during which samples were taken for the analysis of salinity, trace metals and nutrient salts. During the morning of the following day the vessel fished off Simes. The fish haul in 140-144 m produced sufficient hake for scientific purposes. A second trawl in slightly deeper water consisted mainly of horse mackerel. Thereafter the hydrographic survey continued without interruption and was completed at 1000h 17 October off Oporto. The vessel anchored in the harbour of Leixoes at 1045h to disembark the Portuguese scientists plus water samples for intercalibration.

CIROLANA sailed at 1500h 17 October and proceeded directly to a position off the NW coast of Spain where trawling was commenced at 0815h the following day. Three hauls were made; one came fast on a very steep rock bank, one catch consisted mainly of horse mackerel and one contained sufficient hake for scientific requirements. Between 1600h 18 October and 1000h the following day a section of hydrographic stations was worked along the north Spanish coast between the fishing ground and San Sebastion. Samples were collected for the analysis of salinity, nutrient salts and trace metals. The vessel then proceeded to station Cavall (46°30'N 08°00'W) in the Bay of Biscay where hydrographic observations were made between 0830h and 1930h 20 October during deteriorating weather conditions. Overnight CIROLANA steamed northwards with the intention of additional hake fishing on the edge of the shelf. However, poor weather conditions prevented the operation and the vessel set course for Grimsby docking at 0730h 23 October. The attached chart shows the ship's track.

RESULTS

1. Samples for the analysis of trace metals were mostly deep frozen for analysis ashore. Coastal samples were filtered to remove particulate material but most oceanic water was stored unfiltered.

   Mercury was analysed on board at the time of collection using unfiltered water from the surface, middle and near bottom. The inorganic mercury content was mainly below 10 ng/l over most of the survey area. However, total mercury values varied between between 20-80 ng/l, the higher values generally occurring in coastal regions. Some mercury samples were subdivided and acidified prior to deep freezing for analysis ashore.

   The survey off the Portuguese coast with two scientists from Lisbon on board was part of the joint cooperative programme being carried out under the auspices of the ICES Working Group on Pollution Baseline and Monitoring Studies in the Oslo Commission and ICNAF area. Three water samples off the Portuguese coast were divided into replicate subsamples in order to intercalibrate the techniques of metal analysis between the Lowestoft and Lisbon fisheries laboratories.

Phosphate, nitrate and silicate were analysed soon after collection by means of the Technicon Auto Analyser. The results generally conformed with the expected distribution and will be of most value when interpreting the trace metal data. Similarly, dissolved oxygen was analysed by Winkler titration on all but the coastal samples. Some samples were analysed for phosphate by the manual method in order to compare results with the automatic technique.

The staff from the Geology Department of Edinburgh University collected particulate material by filtration on most samples for the analysis of both organic and inorganic constituents. This analysis, to be carried out ashore, should provide a valuable supplement to the data on the dissolved material.

2. Twelve medium sized (40-50 cm) hake were collected off each of the Portuguese and Spanish coasts and were stored deep frozen for the analysis of metals and pesticides by the Burnham-on-Crouch laboratory. A miscellaneous collection of other species of fish were also retained for analysis.

No hake were found at the Azores but a sample of scabbard fish was retained. Subsequent discussions with Portuguese fisheries staff confirmed the unsuitability of the ground for bottom trawling and the absence of hake from the region.

3. The launching of the Twerle buoys from the starboard side of the after deck proved to be a successful operation. The damage to the aerial after the third launch indicated a major structural weakness in this component.

4. Four 50 l water samples were collected on the Azores-Straits of Gibraltar section for the analysis of radioactive caesium by the Fisheries Radiobiological Laboratory.

SEEN IN DRAFT R A Taylor
W J Saxby

P G W Jones
5 November 1975

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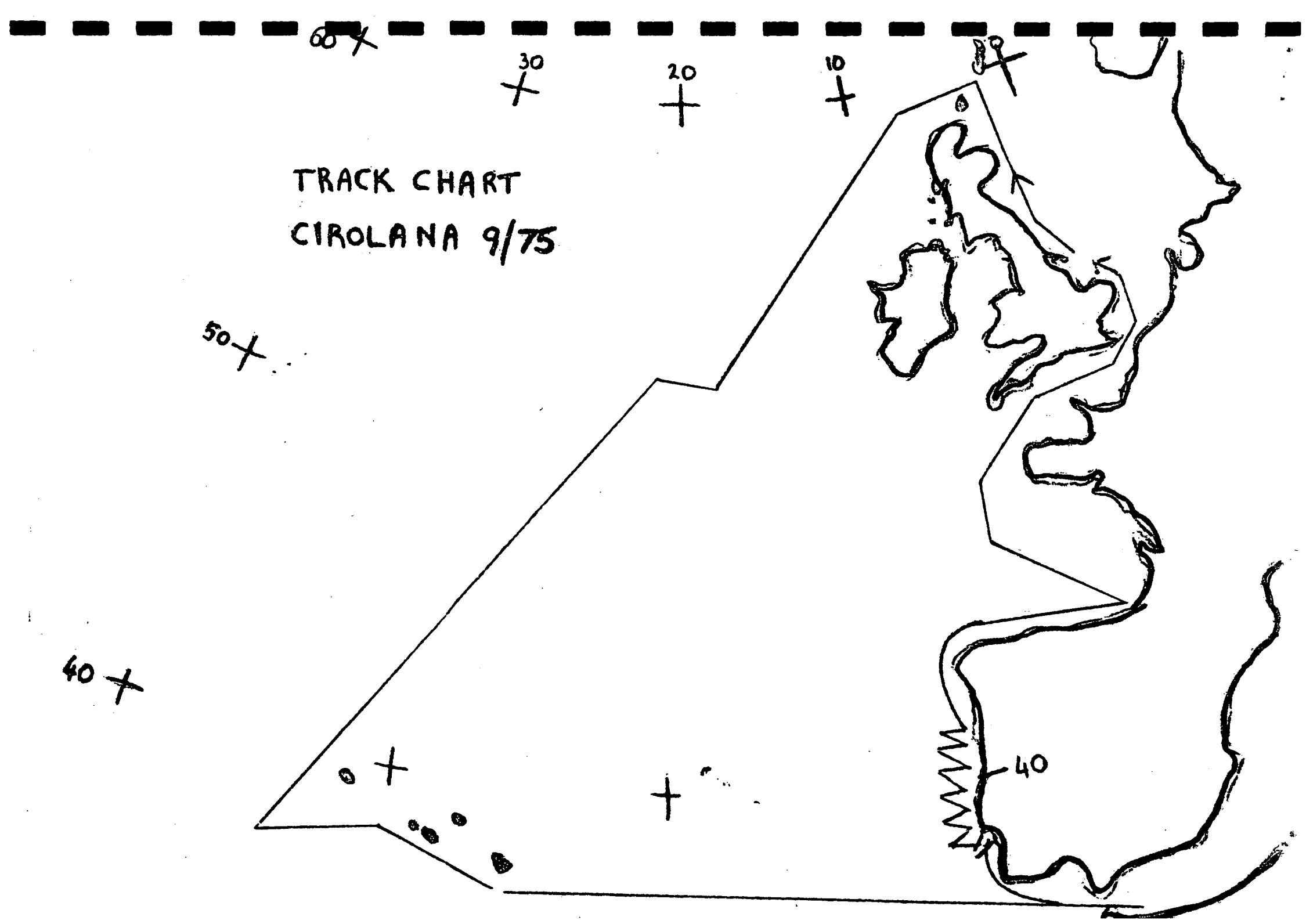
TRACK CHART
CIROLANA 9/75
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