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

1984 RESEARCH VESSEL PROGRAMME

REPORT : RV CLIONE 3/84

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

STAFF:

M S Rolfe
H L Rees
D S Limpenny
C D Byrne) until 2 March
Nicola Shakspeare)
P A West until 3 March
R J Rycroft)
S M Rowlatt) from 2 March
Debbie Chapman (Univ Coll London))

DURATION:

Left Lowestoft 1502h, 24 February
Arrived Lowestoft 0015h, 9 March

AIMS:

1. To sample along a transect through the Tyne sewage sludge dumping ground for physical, bacteriological, biological and chemical analysis using Day grab and beam trawl.

2. To collect Nephrops, commercial fish and fauna for chemical analysis and sediment samples for physical and chemical analysis off the north east coast.

3. To sample and observe fly-ash contaminated sediments off Blyth using grabs and U/W television.

4. To investigate the dispersion of liquid industrial waste off the Tees by continuous water sampling and Baird Atomic fluorimeter.

5. To collect Modiolus in and around the Humber dumping ground for biological, chemical and bacteriological analysis.

6. To collect suspended matter in the wake of dumping vessels in the Barrow Deep for electron microprobe analysis.

7. To conduct a routine monitoring survey in the outer Thames estuary, collecting sediments for physical, biological and chemical analysis.

8. To collect commercial fish and fauna in the outer Thames estuary for chemical analysis.

9. To compare the efficiency of core and grab sampling of surface sediments using a range of gear.

10. To collect, from widely-spaced sites along the east and north-east coast, sediments and fauna for chemical analysis as a preliminary bench mark.

NARRATIVE

CLIONE sailed north from Lowestoft for the Tyne area; 9 widely-spaced grab stations were worked en route (Aim 10). On arrival off the Tyne, Aim 1 was commenced at 1504h, 25 March using a 0.14m^2 Day grab at 25 stations, and completed at 1950h. Before CLIONE rendezvoused with the dumping vessel YARROW on 26 February, trials were made with a submersible pump towed on a Braincon V-fin from the portside crane away from the CLIONE's bow-wave in preparation for Aim 4. Water quality was continuously monitored using a Barid Atomic fluorimeter and Guildline package. In deteriorating weather, the towed pump was damaged and water intake was switched to the CLIONE's stainless-steel pump. Despite the fact that this source of sea-water is in the boundary layer around the hull, monitoring astern of the YARROW proved successful in so far as distinct peaks were registered on both the fluorimeter and Guildline recorders. On 27 February grabbing was repeated at ten selected stations on the previously worked transect. Replicate grab samples were taken, four groups of faecal bacteria were enumerated at each station, in addition to the usual benthos and sediment sampling. Two 2m beach trawl stations were worked on the transect and, at dusk, two Granton trawl hauls were made off the Tyne (Aim ?), where Nephrops with elevated mercury levels had been taken previously on CLIONE 4/82. On the following morning four sediment samples were taken in the same area followed by three off Blyth for sediments containing fly-ash deposits (Aim 3). During this time SIR FON and two other vessels were observed dumping fly ash and fine colliery waste; no short dumping was observed. At 1400h CLIONE again rendezvoused with the YARROW in the Tees liquid waste disposal ground. The YARROW made repeated runs across CLIONE's bows while the latter held station with the Pleuger before moving ahead into the waste slick immediately after the YARROW had passed. Again, satisfactory peaks were recorded from which estimates of dilution of the waste can be made. Before leaving the Tyne-Tees area, a third beam trawl station was completed on the transect worked earlier off the Tyne. CLIONE then steamed south towards the Humber at 1850h, 28 February.

29 February and 1 March were both spent sampling Modiolus (Aim 5) using a Forster Anchor dredge and, more often, a bar of three Newhaven scallop dredges. Many of the hauls over the hard ground were poor or empty but eventually satisfactory samples were obtained from within and near the Humber dumping ground, in the Inner Dowsing area and off Blakeney, Norfolk. The Modiolus were size-measured, cleansed to void gut contents and deep frozen. No bacteriological analyses were done on the samples. Weather conditions were perfect for underwater camera and television work but unfortunately one cable had been supplied with a wrong connection and this work could not be done. En route for Lowestoft, two Granton trawl hauls were made at Smith's Knoll (a lower priority aim not included in the cruise programme). CLIONE then took shelter in Corton Roads in increasing NW winds before docking at 2017, 2 March. Miss Shakspeare and Mr Byrne then went ashore and Drs Rowlatt and Chapman and Mr Rycroft came aboard. Dr West disembarked the following morning at 0930h and CLIONE sailed at 1001h bound for the outer Thames estuary. Day grabbing and Tennant coring commenced at 1630h in the Middle Deep and continued on 4 March (Aims 7 and 9). Where repeated sampling was required it was generally necessary to anchor the vessel. The morning of 5 March was too foggy to rendezvous with the TWA dumping vessels (Aim 6) and grabbing and coring were continued in the Middle Deep. Conditions worsened on 6 March, but the underwater television was deployed at slack water while still at the overnight anchorage in the Middle Deep. No satisfactory observations were made because of the high levels of suspended solids. Grabbing at two stations in the Barrow Deep was possible in mid-afternoon when visibility improved for a while.

CLIONE then proceeded to a known muddy area off the Gunfleet to collect samples for Dr Pat Lawson of Essex University and for radiometric dating and to anchor overnight.

CLIONE rendezvoused with the TWA vessel BEXLEY on 0810h 7 March and followed, then lay, in the sewage sludge slick for over two hours (Aim 6). Water sampling, using the submersible pump suspended from the hydrographic wire at various depths, was continued until 1036h by which time the slick had largely broken up.

Two beam trawlers and an angling party were actively fishing in the world's largest sewage sludge disposal site where three vessels had recently discharged. A grab and corer station and two beam trawl stations were then worked in the Barrow Deep and a corer station in the Swatchway before two Granton trawl hauls were made in the East Swin area. Again, on 8 March, CLIONE rendezvoused with the BEXLEY at 0840h and water sampling in the slick continued as on 7 March. At 1000 hrs CLIONE steamed towards Lowestoft, completing a further 8 grab stations and a beam trawl station en route to complete Aims 7 and 10.

RESULTS:

Little time was lost to bad weather and most aims were achieved satisfactorily.

Aim 1: Successful; 25 grab stations followed by ten stations repeated and 3 beam trawls, a clear trend was apparent from the bacteriological analyses.

Aim 2: Samples of Nephrops, cod, whiting and plaice were collected at 2 Granton trawl stations. In addition four sediment samples were taken.

Aim 3: No U/W television work was possible in the swell but satisfactory sediment samples were obtained (3 stations).

Aim 4: Although sampling of the waste with the towed pump was not possible, very useful results were obtained using the stainless steel pump supply. There is still a need to develop a better continuous water sampling device which can be towed at speed out of the ship's bow-wave or wake (2 stations).

Aim 5: Adequate samples of Modiolus were obtained from five areas (25 stations for Forster anchor dredge and/or Newhaven scallop dredges).

Aim 6: Two good sets of water samples were collected by Dr Debbie Chapman in the sewage slicks and the aim satisfactorily completed. In addition Dr Chapman collected a number of microfauna and macrofauna samples for associated studies.

Aim 7: Adequate sets of grab samples were obtained at 28 stations in the Middle Deep for sediment analysis, although grabbing could not be achieved at all the pre-selected sites due to the ship's draught. Seven grab stations were worked and three beam trawl hauls made in the Barrow Deep and East Swin for benthos.

Aim 8: Samples of cod and whiting were collected from the East Swin and Buccinum and Asterias from the Barrow Deep and East Swin (2 Granton trawl and 3 beam trawl stations).

Aim 9: This aim overlapped with Aim 7. 25 cores were collected, mainly from the Middle Deep, for comparison with grabbed samples and also for radiometric dating for estimation of sedimentation rates and mixing depths.

Aim 10: Thirteen grab stations were worked between the Sunk LV and the Tyne for sediments. Very few yielded any fauna for chemical analysis.

M Rolfe
14 March 1984

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R C N

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H W H

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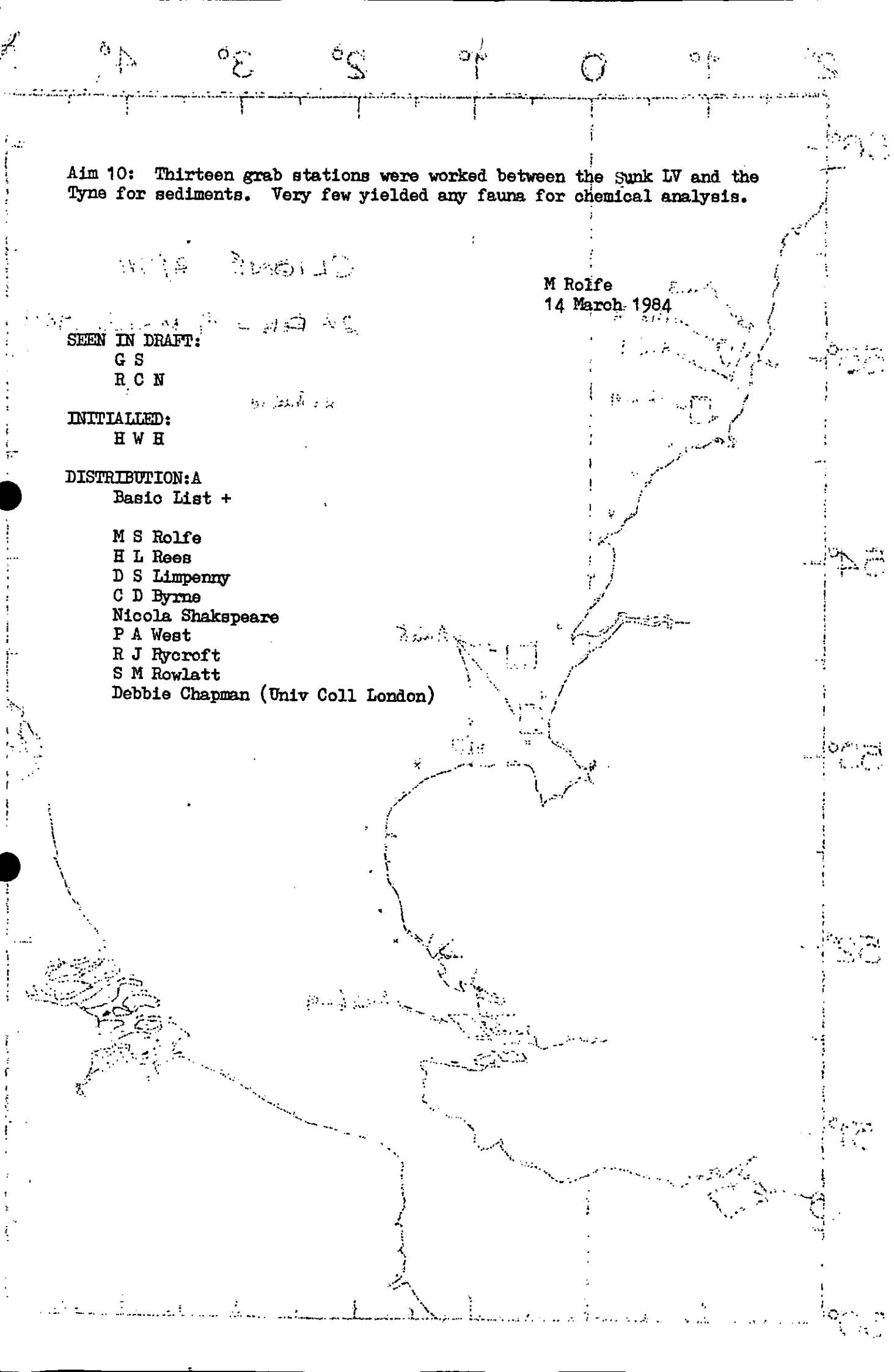

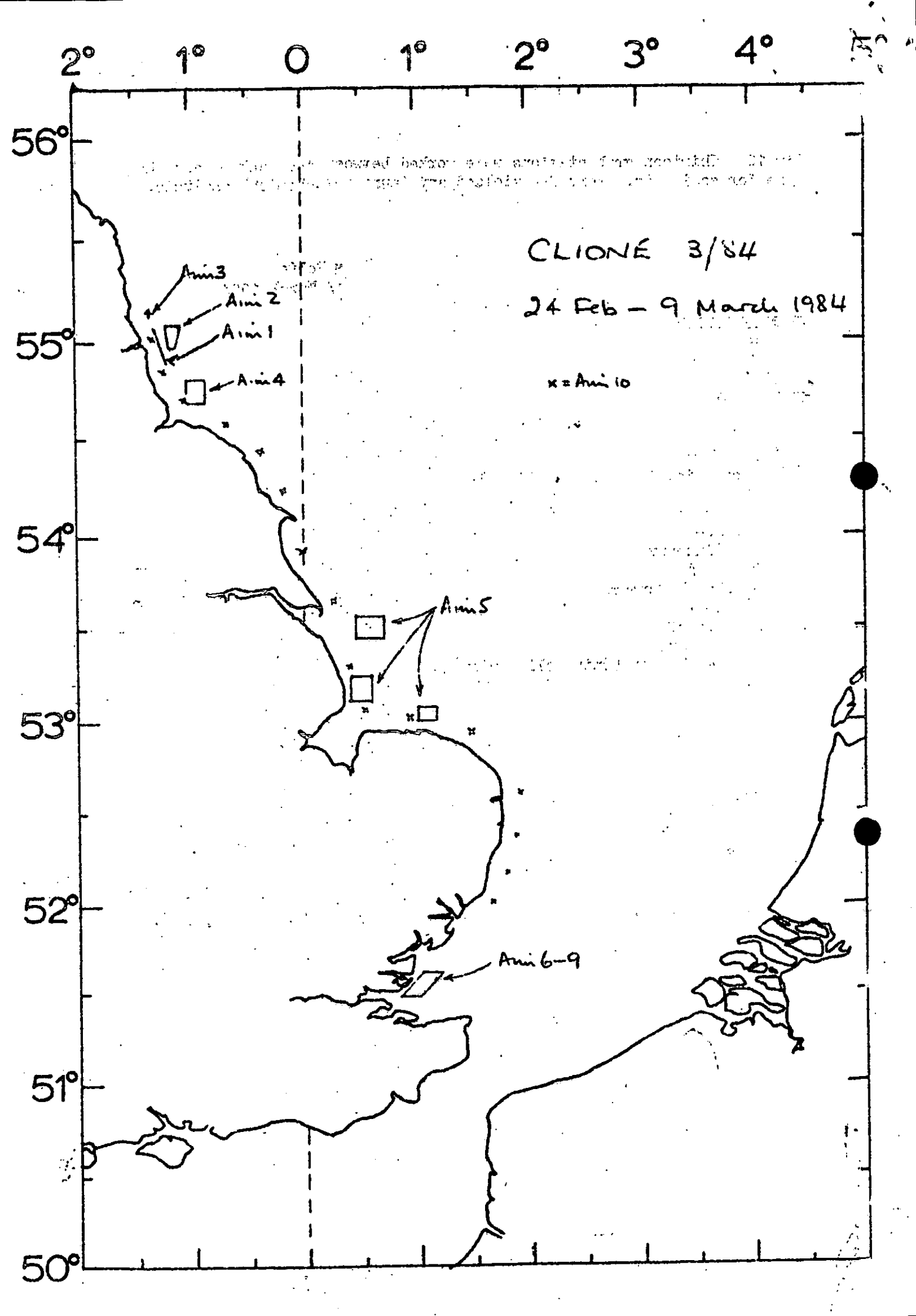
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CLIONÉ 3/84
24 Feb – 9 March 1984
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Ami 2
Ami 1
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Ami 6–9