

MR. Bate

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

1974 RESEARCH VESSEL PROGRAMME

REPORT: RV CORELLA: CRUISE 4

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

STAFF

P G W Jones  
A R Folkard  
D S Kirkwood (Burnham-on-Crouch)  
R A Nicholson (Institute of Geological Sciences)  
A Davis ( " " " " )

DURATION

Left Lowestoft 1150 h, 13 March  
Arrived Lowestoft 1245 h, 26 March  
All times are Greenwich Mean Time

LOCALITY

North Sea and eastern English Channel

AIMS

1. To test techniques for the sampling of trace metals in sea water on selected sections of the standard North Sea trace metal grid.
2. To measure the variation in the metal and phosphate content of water at selected inshore localities over a tidal cycle.
3. To sample surface sediments in an area off the English coast between 52° and 54°N for trace metal analysis.
4. To sample the water and surface sediment off Benacre for trace metal analysis in the vicinity of the wreck of MV BURTONIA.
5. To collect and exchange water samples for an intercalibration of techniques for analysing trace metals between the laboratories of Texel, Belgium and Lowestoft.
6. To survey the distribution of dissolved phosphate in the water of the Thames Estuary.

NARRATIVE

After departing from Lowestoft, CORELLA sailed southwards towards the English Channel and on passage sampled water in the outer Thames Estuary for phosphate analysis. Water samples for trace metal analysis were collected on a section across the eastern English Channel between 0250 h and 0810 h, 14 January. The vessel then proceeded to the Thames Estuary where water samples for metal and phosphate analysis and sediment samples for metal analysis were taken at anchor over a 13 hour tidal cycle off Southend (2230 h, 14 March-1130 h, 15 March) and in the Ooze Deep (1540 h, 15 March-0440 h, 16 March). Water samples for metal analysis were then taken on a section between the Thames Estuary and

the Hook of Holland, followed by the collection of water for metal and phosphate analysis over a 13 hour tidal cycle off the Hook of Holland (0940-2240 h, 17 March).

The vessel proceeded to Zeebrugge, arriving at 0815 h, 18 March, to deliver water samples for metal intercalibration to the Free University of Brussels via representatives of the Belgian Navy. CORELLA sailed at 1435 h the same day and proceeded to Den Helder, docking at 0730 h the following morning. During 19 March water samples for metal intercalibration were exchanged with the Texel Laboratory of the Netherlands Institute of Sea Research and the ship's scientists visited Texel to discuss projects of common interest. The same day a MAFF hydrographic buoy that had been recovered locally was returned to the ship.

CORELLA sailed from Den Helder at 0730 h, 20 March and continued sampling water and sediments over a grid in the southern North Sea. Sediment and near bottom water was sampled in the vicinity of MV BURTONIA between 2130 h, 20 March and 0015 h, 21 March.

Water samples for metal and phosphate analysis and sediment samples for metal analysis were collected over 13 hour tidal cycles in the estuary of the River Humber off Spurn Head (2130 h, 22 March-1030 h, 23 March), off Hull (1430 h, 23 March-0330, 24 March) and off Immingham (0730 h-2030 h, 24 March). By 0600 h, 26 March the sampling programme had been completed. CORELLA then returned to Lowestoft docking at 1245 h the same day.

## RESULTS

1. Surface water samples collected for metal analysis were filtered through millipore membranes of pore diameters 0.22, 0.45 and 0.80  $\mu\text{m}$  in order to ascertain the effect of pore size on the apparent dissolved metal content of the water.

Surface samples were collected by plastic bucket and Niskin bottle and near bottom water was sampled by pump and Niskin bottle in order to compare the results obtained by the different sampling techniques. All water was returned to the shore laboratory deep frozen for analysis by atomic absorption spectroscopy.

Two surface samples were collected for a trace metal intercalibration exercise, one in the central eastern English Channel and the other in the Thames Estuary off Southend. The water was filtered through 0.22  $\mu\text{m}$  millipore membranes. Each sample was subdivided such that the Texel laboratory, the Belgian laboratories, the Lowestoft hydrography section and the Fisheries Radiobiology Laboratory each received five subsamples for analysis. The Texel laboratory also provided samples to be analysed at Lowestoft.

Surface sediment samples for metal analysis were collected by dredge and stored deep frozen for analysis by the London laboratory of the Institute of Geological Sciences.

2. The samples for the analysis of phosphate at the tidal cycle stations were analysed at sea by means of the Technicon Auto-Analyser. At both stations in the Thames Estuary and off Spurn Head and Hull in the Humber Estuary the phosphate cycle appeared relatively simple, with the maximum values occurring at low water. However, off Immingham and the Hook of Holland the phosphate cycle was more complex. The results of the salinity and metal analysis at these latter stations will probably help in the interpretation of the phosphate results.
3. MISCELLANEOUS. The sediment samples were collected off Lowestoft for

Mr J Joyce (NERC Student Main Laboratory). A water sample was collected off Hull for mercury analysis by Mr C Baker (Fisheries Radiobiological Laboratory). Two sediment samples were collected off the Lincolnshire coast for Mr M Rolfe (Burnham on Crouch).

P G W Jones  
8 April 1974

SEEN IN DRAFT: JEMB  
                  CNS

INITIALLED: AJL

DISTRIBUTION:

Basic List

P G W Jones

A R Folkard

D S Kirkwood (Burnham-on-Crouch)

R A Nicholson (Institute of Geological Sciences)

A Davis (           "       "       "       "       "

