

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

1971 RESEARCH VESSEL PROGRAMME

REPORT: R V CIROLANA: CRUISE 8A

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

STAFF: D F Jefferies
J W R Dutton
B R Harvey
A K Steele
C W Baker
R J Read
D C Denoon
C Bevan (Royal Naval College, Greenwich)

DURATION:

28 September - 7 October

AIMS:

1. To continue the examination of the budget of artificial radionuclides in the Irish Sea.
2. To collect seawater samples from the Irish Sea for trace element analysis.
3. Collection of seawater samples in the North Sea and North-east Atlantic to determine caesium-137 and trace element concentrations.
4. Further tests of total gamma counting above the sea surface to discriminate between background radiation and radioactive discharge situations.
5. Collection of zooplankton at selected stations and samples of haddock at 2 stations for Dr J H Steele, DAFS, for trace element analysis within the IDOE programme.

NARRATIVE

R V CIROLANA sailed from Grimsby on the morning tide of 28 September en route to the Irish Sea. 100 litre samples of surface sea water were collected for analysis of caesium-137 at 22 stations in the North Sea, off the North coast of Scotland and out to the Rockall Bank in the North-east Atlantic. In addition, 1 litre samples of surface sea water were taken for trace metal (Zn, Fe, Mn, Cu, Ni, Pb and Cd) analysis in both the filtrate and particulate fractions. At selected stations 1 litre samples of surface sea water were also retained for Co and Hg analysis. At 10 stations 2 x 2½ litre samples of surface sea water were retained for Hg analysis by neutron activation techniques by Mr C Bevan (RN College, Greenwich). Samples of plankton were obtained at 5 stations, 1 in the North Sea and 4 in the North-east Atlantic, and samples of haddock from the North Minch and Rockall Bank area for Dr J H Steele, DAFS for analysis of certain trace metals and organic pollutants, as part of the IDOE programme.

The Irish Sea sampling programme commenced 2100 2 October at the North Channel. Sea water samples were taken from surface, midwater and bottom depths and filtered through Millipore cellulose acetate filter papers of 0.22 µm pore size. One 25 litre sample, from each depth, was retained for radiochemical analysis at FRL and one 25 litre sample was passed, on board, through a KCFC (potassium cobalt ferrocyanide) ion exchange column for selective extraction of the caesium radionuclides. One litre samples were retained, from each depth, for trace element analysis. Whenever possible, at each station, samples of seabed were obtained, by means of a gravity corer or a modified Van Veen grab, for gamma spectrometric analysis.

Nine stations had been worked in the North Irish Sea before 1500 3 October. Upon completion of the station approximately 2.5 miles north-west of St Bees Head, the bow propeller was given the normal daily test. On completion of the test engine room staff were unable to return the propeller from the extended position. After a number of attempts to retract the housing had failed R V CIROLANA continued working but at the greatly reduced speed of approximately 5 knots. Arrangements were then made with Stone Manganese Marine Ltd, the installers of the bow propeller to send a representative, Mr Stenhouse, to advise on procedures to correct the fault. Mr Stenhouse was picked up from Peel, Isle of Man, on the morning of 5 October. Further unsuccessful attempts to retract the housing were made and at 1930 5 October the sampling programme was continued at the same reduced speed.

R V CIROLANA docked at Liverpool on the afternoon tide of 7 October.

RESULTS

All the main aims of the cruise were completed, although 9 stations of the proposed sampling grid in the western half of the Irish Sea had to be abandoned. 33 seawater sampling stations of the original sampling grid in the Irish Sea were completed (Figure attached).

Shipboard chemistry demonstrated that 2 x 10 column ion exchange systems could be worked satisfactorily in the main laboratory of R V CIROLANA. Comparison of gravity feed with a multichannel peristaltic pump indicated the superiority of the latter system which will be used alone in future cruises.

Total gamma counts above the sea surface were made using a lead shielded 3" x 3" NaI (T1) crystal detector, suspended from the "A" frame and coupled to a gamma spectrometer. Background measurements were made in the North Sea and in the Atlantic and compared with levels obtained in the North-east Irish Sea. The count rates observed in the immediate vicinity of Windscale, off the Cumberland coast, indicated a relatively constant level, approximately 3x background, from 2-3 miles North to 2-3 miles South of the radioactive effluent discharge point.

D F Jefferies
21 October 1971

SEEN IN DRAFT: EAB
WJS

APPROVED: HAC

DISTRIBUTION:

Basic list plus the following

D F Jefferies
J W R Dutton
B R Harvey
A K Steele
C W Baker
C Bevan (RN College, Greenwich)
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H J Dunster (NRPB Harwell)
H Howells (UKAEA Windscale)
L D G Richings (NRPB Harwell)
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