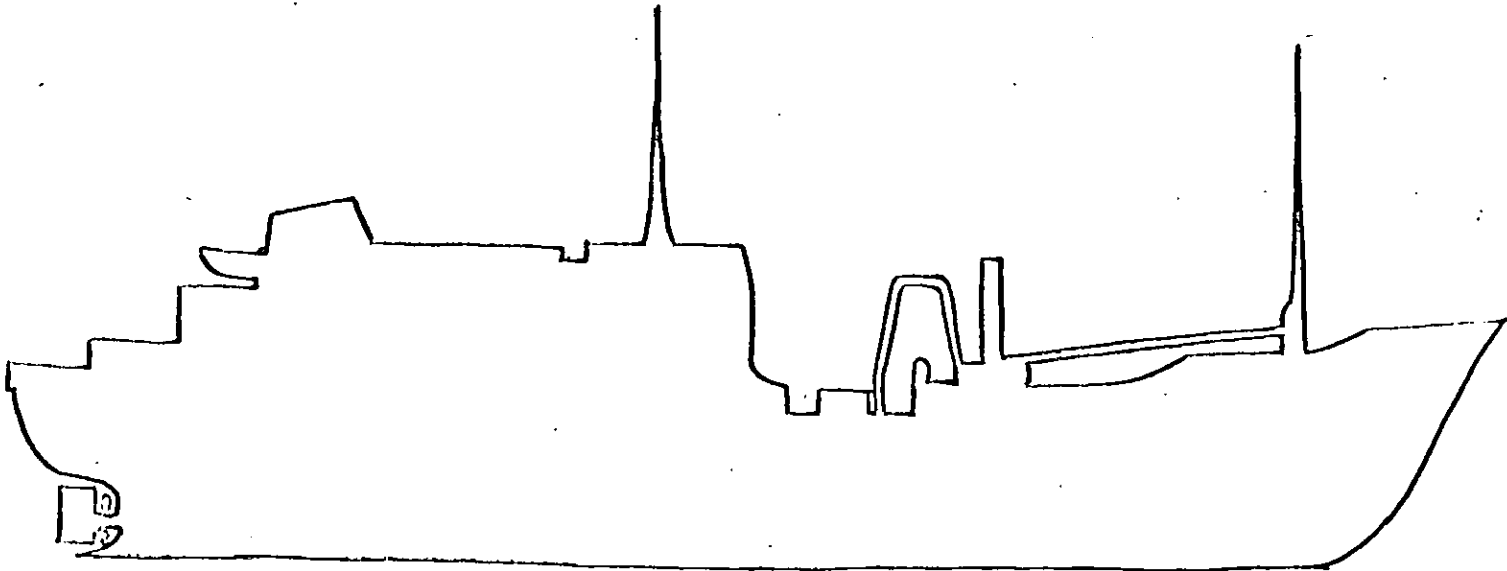


M. I. A. S.

15 NOV 1978



RRS SHACKLETON

Cruise 4/77
Edinburgh University
Department of Geology

25th March - 12th April, 1977

RRS 'Shackleton' Cruise 4/77

Operating Areas and Objectives

Goban Spur and adjacent features of the continental margin southwest of the British Isles.

The objectives were to complete the central and ^a easternmost part of a larger survey designed to investigate the geological structure and history of the continental margin. Most specifically, detailed information on variations in the gravity and magnetic fields and the sediment distribution and crustal structures were sought. In addition, we wished to sample the geological basement and the overlying consolidated sedimentary rocks.

Scientific Personnel

- R. A. Scrutton (University of Edinburgh) (Principal Scientist)
- R. V. Dingle (University of Cape Town)
- R. Devine (University of Edinburgh)
- M. Wilson (University of Glasgow, working for Edinburgh)
- M. Glen (I.G.S., Edinburgh)
- I. Chivers (I.O.S., Barry)
- S. Jones (I.O.S., Barry)
- A. Cumming (I.O.S., Barry)
- P. Hillary (I.O.S., Barry)
- C. Hazlehurst (I.O.S., Barry)
- T. Lane (I.O.S., Barry)

Narrative

SHACKLETON sailed from Barry at 20.00A on 25th March and set course west-southwest for the main survey area. Overnight, 26th to 27th March, the ship had to break off passage to land a sick crew member in Falmouth. Surveying began at the south end of the area at 00.20A, 28th March with logging of bathymetry, gravity and magnetic data and continuous seismic profiling. In moderate to poor weather surveying followed the planned survey pattern unbroken, apart from brief losses of gravity when the ship was rolling heavily, until 12.00A, 2nd April.

Throughout the afternoon and evening of the 2nd April, tensioning of a new main warp was carried out so that it could later be used for sampling. At 22.30A, 2nd April geophysical work was restarted and all parameters were recorded until 00.00A, 4th April. At this time, all equipment over the stern was recovered and SHACKLETON set course for the south end of the survey area to begin the sampling programme.

Sampling by dredge and sediment and rock gravity corers was carried out at 30 sites during the following week. All sites were on seismic lines surveyed earlier. The weather remained good throughout the sampling programme.

At 18.00A, 9th April geophysical work recommenced to investigate remaining problematic areas. All parameters were measured until 23.00A, 10th April when all equipment over the stern was recovered and the ship set course for Plymouth. Geophysical watches were suspended at 04.00A, 11th April. SHACKLETON docked at Plymouth at 08.00A, 12th April, the weather being still unbelievably good.

Equipment

The following equipment was used:

I.O.S. Precision Echo Sounder

Varian Proton Precession Magnetometer

LaCoste-Romberg S Series Gravimeter

Two Channel Geomechanique Hydrophone Array

One Bolt PAR 1500C air-gun with 160 in³ chamber

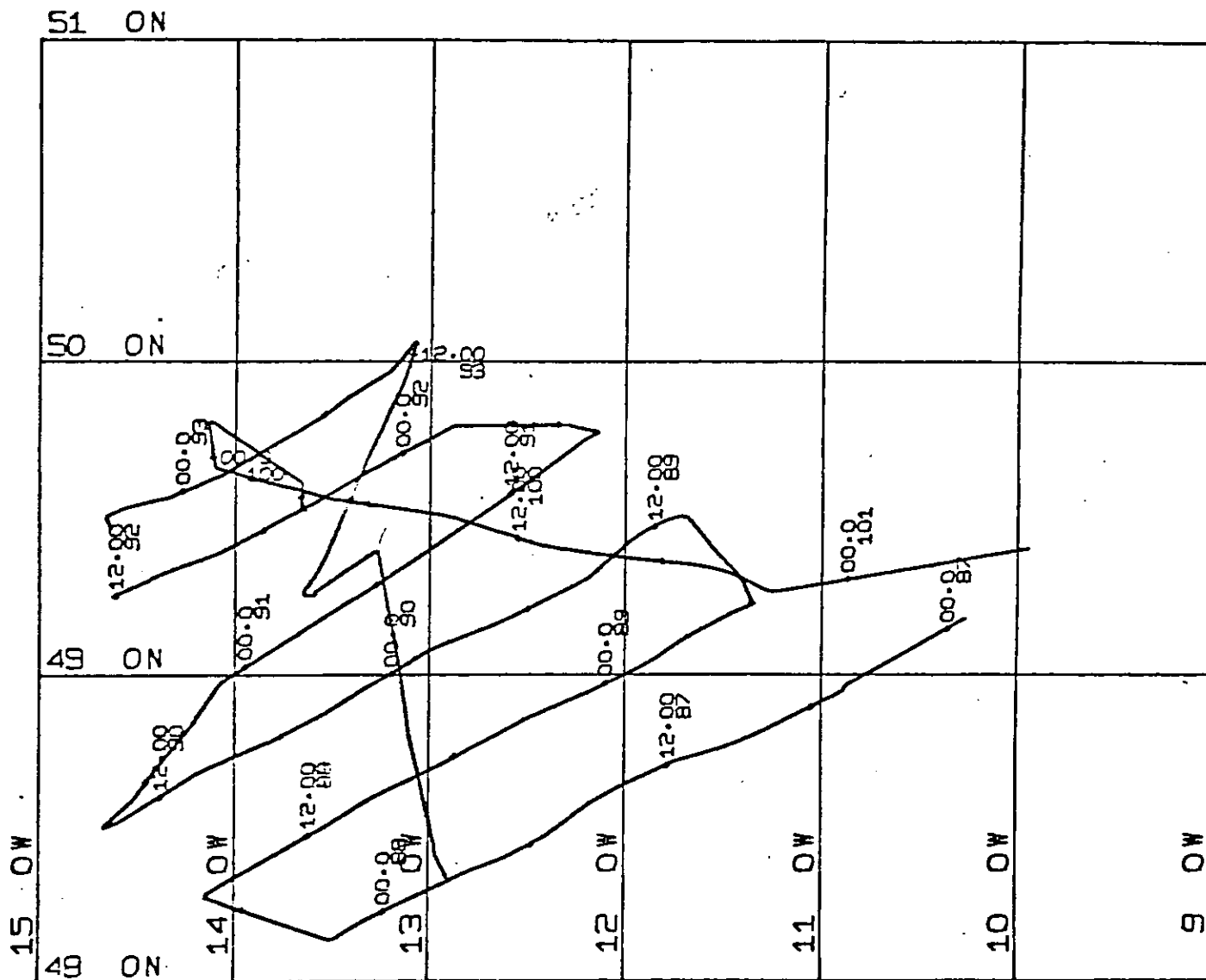
EPC 4100 Dry Paper Profile Recorders

Dredge, Gravity Corer and Sediment Corer

Results

The cruise was a great success due to good equipment performance and good weather. About 1,000 km of continuous geophysical data were collected with the seismic equipment penetrating to geologic basement most of the time and gravity data showing good cross-overs with pre-existing data. Of the 30 sampling stations, only 2 were totally unsuccessful, although a liberal covering of calcareous ooze prevented us realising all our objectives.

Digital logging of navigation data, PES, gravimeter and magnetometer outputs were made at 1 second intervals. These values were processed on board the I.O.S. IBM 1130 shipborne computer. At the end of convenient periods, navigation, profile and posted-value plots were obtained and at the end of the cruise 10 minute values of the various parameters were stored on magnetic tape.



1:50,000

MERCATOR PROJECTION

SCALE 1 TO 210,000. (NATURAL SCALE AT LAT. 57)

INTERNATIONAL SPHEROID