

m.v. WHITETHORN CRUISE

LEG 1, 14th-27th APRIL:- FAIR ISLE SHEET

by

J.A. CHESHER

## 1. INTRODUCTION

In order to comply with Coe Metcalf's request that our survey operation should start ahead of the scheduled date of 29th April to accommodate possible commercial work later in the year, the start date for this leg was brought forward two weeks to commence on 14th April. The m.v. Whitethorn had been laid up in Hull for the winter period without major demobilisation and consequently mobilisation for this years work was completed in two days prior to sailing and comprised mainly the erection and installation of the vibrocorer on the ship.

The object of this leg was to complete the vibrocorer stations planned for the Fair Isle Sheet together with selected gravity cover sites. This was so as to leave the following leg free for occupying the 6m drill sites and additional gravity cover sites required to finish the sheet.

Weather during this leg was considerably better than anticipated with only 3 days weather down time, and this enabled the majority of the planned sites to be completed.

## 2. PERSONNEL

J Chesher	(Chief Scientist)
D Evans	(Day Geologist)
E McElvaney	(Surveyor)
R Nisolson	(Geochemist)
W Lonie	(Engineer)
A Bell	(Engineer)
C Graham	(Night Geologist)
R Sutherland	(Night Deck Operations)

## 3. AREA

Fair Isle Sheet 1:250,000 from 59°-60°N and 0°-2° W<sup>3</sup>

4. RESULTS

Equipment	Shipek	Gravity Corer (Sediment)	Vibrocorer
No of Stations	96	61	34

Total number of stations occupied 96.

5. EQUIPMENT PERFORMANCE

On the ship's side the equipment was satisfactory. New wires were placed on anchor winches where required prior to departure from Hull to enable a 4-point anchoring to be carried out if required. All anchor winches should at present have 1500 metres of wire on the drums. Ship's speed on passage averaged between 10 and 12 knots.

IGS equipment also proved satisfactory apart from water in the electrical cables which resulted in the penetrometer being unable to be used. The new Decca Lat/Long Converter proved excellent and much easier to use than previous system both for anchoring purposes and programming of sample stations. Sample positions could be changed at a moments notice, due to perhaps a change in weather conditions, simply by feeding the latitude and longitude of the new position into the machine so dispersing with the arduous plotting that this would previously have entailed.

6. TIME ANALYSIS

On passage	15%	} Working time
Traversing	31%	
Anchoring	13%	
On Station	16%	
Weather	25%	} Down time

7. GEOLOGICAL RESULTS

In the eastern part of the area the surface sediment layer was generally thin, less than  $\frac{1}{2}$  metre, and consisted of fine grained olive sands or silts often rich in scaphopods. Further west sediments became more shelly and in places the shell sands exceeded 1 metre in thickness.

The overlying Quaternary deposits consisted of soft grey, brown and pink clays, clean grey sands, red sands and tough grey sandy pebbly boulder clay.

Solid rock was recovered at a number of sites often overlain by a very coarse or fine well sorted gravel layer. Greenish grey siltstones were obtained in the southern part of the area and were probably of lower Cretaceous age. Further north friable red sandstones of Permo-Triassic age and dark purplish sandstones of probable Devonian age were recovered.

#### 8. CONCLUSIONS

Although the weather was far from perfect, it was considerably better than might have been expected for the time of year and enabled the majority of the planned vibrocorer sites to be completed. In areas of friable fairly soft sediments such as Permo-Triassic sediments the vibrocorer obtained excellent cores of solid rock material.

APPENDIXShips Log Leg 1Thursday 14th April - Wednesday 17th AprilThursday 14th April

0000-1900 In port Hull, mobilisation.  
1900 Departed from Hull.  
1900-2400 Steaming towards Fair Isle Area.

Friday 15th April

0000-2400 Steaming en route to Fair Isle.

Saturday 16th April

0000-1000 Steaming en route to Fair Isle.  
1000-2100 Vibrocoring Fair Isle Sheet SW. Penetrometer not operational.  
2100-2230 Attempting to repair penetrometer.  
2230-2400 Vibrocoring, penetrometer still not operational.

Sunday 17th April

0000-0700 Routine sampling Fair Isle Sheet SW and SE.  
0700-2200 Vibrocoring Fair Isle Sheet SE. (Shipek winch lever mechanism pin sheared 2100-2130).  
2200-2400 Routine sampling.

Monday 18th April

0000-0700 Routine sampling Fair Isle Sheet SE.  
0700-2200 Vibrocoring Fair Isle Sheet SE.  
2200-2400 Routine sampling Fair Isle Sheet SE.

Tuesday 19th April

0000-0700 Routine sampling Fair Isle Sheet SE. Shear pin on shipek grab sheared.

## Appendix Contd

0700-1700 Weather too bad to vibrocore, NNE 6-8 continued routine sampling en route to Shetlands for shelter due to imminent bad weather.

1700-2400 At anchor Levenwick Bay, E of Shetland sheltering from weather.

Wednesday 20th April

0000-2400 At anchor Levenwick Bay. Checked out penetrometer system, water in electric cables.

Thursday 21st April

0000-0800 At anchor Levenwick Bay.

0800 Weighed anchor and steamed out attempt to work.

0800-1000 Routine sampling Fair Isle Sheet NW.

1000-2300 Vibrocoring Fair Isle Sheet NW. Minor problem on bulkhead plug of vibrocorer electrical box.

2300-2400 Routine sampling Fair Isle Sheet NW.

Friday 22nd April

0000-0700 Routine sampling Fair Isle NE Sheet

0700-2300 Vibrocoring Fair Isle NE Sheet.

2300-2400 Routine sampling Fair Isle NE Sheet.

Saturday 23rd April

0000-0700 Routine sampling Fair Isle NE.

0700-1600 Vibrocoring Fair Isle NE. Weather deteriorating from E.

1600-1800 Routine sampling towards Shetland Isles to shelter from weather.

1800-2000 Steaming for shelter on west side of Sumborough.

2000-2400 At anchor at Quendale due to bad weather from NE.

## Appendix Contd

Sunday 24th April

0000-2400 At anchor at Quendale due to weather. Dory taken ashore to inspect weather to east of Sumborough. Mercury recoil starter system failed on return journey. Leak from radiator of inboard power pack to A-frame.

Monday 25th April

0000-0600 At anchor Quendale due to weather.  
0600-2300 Vibrocoring Fair Isle Sheet NE and SE.  
2300-2400 Routine sampling Fair Isle Sheet SW.

Tuesday 26th April

0000-0700 Routine sampling Fair Isle Sheet SW. Shear pin on shipek grab control lever sheared.  
0700-2000 Vibrocoring Fair Isle Sheet SW. Fuel pump of power pack for A-frame required replacement.

CRUISE NO

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LEG

01

DATES: FROM

1,4,0,4,8,3<sup>14</sup>

TO

2,7,0,4,8,3<sup>20</sup>

CRUISE AREA

FAIR ISLE

## PERSONNEL

Senior scientist

J. A. CHESHER 16

Surveyor

E. MCELVANNEY 32

Day Laboratory

48

Day Geologist

D. EVANS 64

Deck Technician

W. LONIE 80

Maint. Techn.

A. BELL 16

Night deck

R. SUTHERLAND 32

Night Lab.

C. GRAHAM 48

Geochemist

R. NICOLSON 64

Other

80

## SUMMARY ACCOUNT

WEATHER BETTER THAN ANTICIPATED, ENABLING VIBRO-CORING PROGRAMME FOR FAIR ISLE

SHEET TO BE ALMOST COMPLETED DURING THIS LEG

## TIME ANALYSIS

% WORKING TIME				% DOWN TIME											
ON PASSAGE	TRANSITING	ANCHORING	ON STATION	WEATHER	SHIP					ICE					
					PROPULS	POWER	ANCHS	DECK	CS	CAMP	GREY C.	VE	Drill	Winch	Other
15	31	13	16	25											

'OTHER' Equipment type

## RESULTS

Equipment	Shipek G	Camera G	CS	CR	VE (ANCH)	VE (ANCH)	Drill	Other
No of stations	96		61		34			

'OTHER' Equipment (or A/A)

Enter 'A' if 'other' is anchored

## EQUIPMENT PERFORMANCE

Shipek grab

SATISFACTORY, LEVER SHEAR PIN FAILED 2

Camera grab

NOT AVAILABLE

Quality cores

SATISFACTORY

Vibrocorer

SATISFACTORY, APART FROM WATER IN CABLES

Drills

NOT USED

Winches

SATISFACTORY

Other

SAT/NAV PROVED EXCELLENT

Ship

SATISFACTORY, APART FROM FUEL PUMP

## GEOLOGICAL SUMMARY

FINE OLIVE SANDS AND SILTS, IN EAST OF AREA, MORE SHELLY SANDS, IN THE WEST.

QUATERNARY CONSISTS OF SOFT GREY TO PINK CLAYS, RED AND GREY SANDS AND GREY TILL.

SOLID ROCK LOWER CRETACEOUS SILTSTONES, IN SOUTH AND RED PERMO TRIASSIC AND DEVO

## OTHER CORRELATIONS

MIAN ROCKS FURTHER NORTH