

INSTITUTE OF GEOLOGICAL SCIENCES  
MARINE GEOLOGY UNIT  
Internal Report No 82/10

CRUISE REPORT ON 6TH LEG OF WHITETHORN,

CRUISE NO 82/WH/06

10 - 23 June 1982

by

D Evans

82/10

## 1. Introduction

The object of the leg was to complete sampling of the Rona Sheet, carry out initial sampling of the Fair Isle Sheet and to use the new rock drill to complete work on the Orkney Sheet.

In the event, much work was carried out on the Fair Isle Sheet and some on the Foula Sheet, but none was done on the Rona Sheet while the new drill failed to operate effectively.

## 2. Personnel

D Evans	IGS	MGLU	Party Chief
A C Skinner	IGS	MGLU	Day Geologist
J McGuigan	IGS	MGLU	Day Laboratory
G Tulloch	IGS	MGLU	Surveyor
J Pheasant	IGS	MGLU	Technical Officer (15-23 June)
P J Wiggins	IGS	MGLU	Technical Officer
N Campbell	IGS	MGLU	Technical Officer
M Stoker	IGS	MGLU	Night Geologist
N A Ruckley	IGS	MGLU	Night Laboratory
B A R Tait	IGS	ACU	Night Geochemist
D Buttle	Marine Acoustics (10-13 June)		

## 3. Equipment

5m drill

1m drill

20ft Vibrocorer (in hold, not used)

Gravity Corer system

Shipek grab system

#### 4. Ship's Performance

The ship performed well during the leg, with no downtime.

#### 5. IGS Equipment Performance

All systems used worked well with the notable exception of the 5m drill.

A technical report on the drill may be found in appendix II. With the exception of a 6in core at a test site the drill failed to recover core and displayed a series of technical problems.

#### 6. Geological Results

- a) Foula. An ORS core was drilled immediately south of the Island of Foula, and a gneiss was recovered north of the island on the western side of the Ve Skerries ridge.
- b) Fair Isle. A gravity coring programme was run in this sheet area, about 140 stations being occupied. Some solid Permo-Triassic was recovered from the West Fair Isle Basin, and some ORS from around Fair Isle itself.

The surface sediments were shelly and clean in the west, becoming finer and more lithic to the east of Fair Isle.

#### 7. Conclusions

- 1. The cruise was successful in all aspects except the 5m drill.

2. Once again equipment has been brought to sea which has not been previously tested 'on land' to a standard at which it had a reasonable chance of operating at sea. Despite the consciencious work of the technical group a variety of problems were experienced, none of which could not have been established by intensive testing off the end of a pier. In terms of day work on the ship some 9 days were lost by this failure and much other time spent less effectively than might otherwise have been possible.

#### 8. Recommendations

Intensive testing of prototype equipment must be carried out on land prior to being used at sea.

## APPENDIX 1 - SURVEY LOG

### Wed 9 June

0001-0630 Steaming for Scrabster  
0630-2400 Alongside at Scrabster

### Thurs 10 June

0001-1930 Alongside at Scrabster  
1930-2400 Steaming for N Orkney Sheet

### Fri 11 June

0001-0740 Steaming  
0740-1315 On drill site. Drill did not function.  
1315-2400 Gravity coring programme

### Sat 12 June

0001-0945 Gravity coring  
0945-1200 Stop due to weather, head for Scalloway for shelter.  
1200-2400 At anchor near Scalloway

### Sun 13 June

0001-1825 At anchor near Scalloway. Set up 1m drill, put off D Buttle  
1825-2350 Test site for drill off Walls.  
2350-2400 Night sampling

### Mon 14 June

0001-0735 Night sampling  
0735-2000 Midi drilling  
2000-2400 Night sampling

### Tues 15 June

0001-0855 Night sampling  
0855-1400 Midi drilling  
1400-2030 Port call Scalloway, pick up J Pheasant  
2030-2400 Night sampling

Wed 16 June

0001-0810	Night sampling
0810-2350	In Bay off Shetland working on drill
2350-2400	Night sampling

Thurs 17 June

0001-0725	Night sampling
0725-1220	Occupying drill site. Unsuccessful
1220-2100	Gravity coring
2100-2345	Anchored for drill in shelter
2345-2400	Night sampling

Fri 18 June

0001-0805	Night sampling
0805-2320	Anchored at 3 locations working on drill, off Shetland
2320-2400	Night sampling

Sat 19 June

0001-1330	Night sampling
1330-2400	Heading for, anchored off and leaving Kirkwall for sheltered work on drill.

Sun 20 June

0001-0120	Heading for sampling area.
0120-0900	Night sampling
0900-1605	Anchored on drill site. Tidal difficulties encountered.
1605-2400	Gravity coring

Mon 21 June

0001-2400	Gravity coring
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Tues 22 June

0001-0225	Gravity coring
0225-2400	Steaming for Blyth

Wed 23 June

0001-0615	Steaming to Blyth
0615-2400	Alongside at Blyth

TABLE 1 TIME UTILIZATION ANALYSIS

SHIP: WHITETHORN DATES: 10.6.82-23.6.82 LEG NO. 6 SHEET NOS.       

	DATE	10	11	12	13	14	15	16	17	18	19	20	21	22	23	TOTALS
		6	6	6	6	6	6	6	6	6	6	6	6	6	6	
Working Time	In Port	7.5													18	25.5
	On Passage	16.5	7.75				7								6	38.0
	Traversing		7	9	1.5	10.75	8.5	7	12.75	10.75	16.5	12.75	19	21.5		137.0
	Anchoring		1.75		2	6	3.5	0.5	2.5	4	1	1.75		1.5		24.5
	On Station		6.75	1.5	2	7.25	5	2.25	6.75	5.25	4	9.5	5	1		56.25
Down Time	Weather			6.25	18.5											24.75
	SHIP															
	Propulsion															
	Power Supply															
	Anchoring															
	Handling Systems															
	IGS															
	Camera															
	Grab															
	Gravity Corer															
	Vibrocorer															
	Rock Drill		0.75	7.25				14.25	2	4	2.5					30.75
	Other															
	Winches															
	Power Cables															
No. of Stations	Grab		10	13	1	13	12	11	21	11	20	26	31	4		<del>173</del>
	Rock Corer		2			3	4	5	6		5	1				26
	Sediment Corer		5	10		6	9	5	12	10	7	22	31	2		<del>119</del>
	Vibrocorer															
	Drill					2				1		1				4
	Other															

REMARKS

Complete to nearest 0.1 hour (6 min)



## APPENDIX II

TECHNICAL REPORT BY J PHEASANT

### Equipment

Leg 6           Shipek Grabs  
                 Grab Handling System  
                 Gravity Corers  
                 Gravity Corer Handling System  
                 6m Rock Drill

Grab Sampling Equipment Continued use was made of this equipment and associated handling gear throughout the leg. An intermittent fault on the handling winch was confirmed as being in the main outboard bearing this being replaced with the spare whilst on passage at end of sampling period.

Gravity Core Equipment As with the grab sampling equipment continued use was made of this system throughout the leg without major problems. An irritating fault on the line metering system gave rise to loss of this facility towards the end of the leg, as a result of failure in the flexible drive cabling from the spooling mechanism to the metering unit. A replacement cable installed in the system failed within 24 hours due to an apparent manufacturing fault. This has been intimated to the manufacturers and replacements are on order.

Rock Drilling Equipment This equipment was not available during the early part of the leg due to the lack of availability of hydraulic oil seals for the main drill drive. On securing this material installation was

completed on board and the unit prepared for use. Initial usage identified an inability to select drilling speed, only high and low being available, the intermediate speeds not responding to selection. Pressure and flow instrumentation faults did not permit easy identification of the reason. Further use was interrupted by strong tides causing damage to an extended drill barrel by pulling the equipment off the occupied site. A modification to the bit weight 'hold back' circuit was carried out and greater control was subsequently achieved on the sites attempted. Coring on the following site was prevented by bit plugging.

Further usage of the equipment identified an overheating problem in the main power pack creating excessive power demand with subsequent overloading of the ship mounted control gear and circuit protection equipment. Whilst a further alteration to the drive circuits on the seabed unit increased the running period without overload the fault was not fully overcome preventing full operational use.