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In Confidence: Not to be quoted without prior reference to the Laboratory

FRV "Scotia"

Cruise 5/84

LD

Report

3 - 22 May 1984

5SR84

Personnel: Part 1

A D McIntosh	HSO in charge
D M Finlayson	SSO
R Payne	HSO
D C Moore	HSO
M R Robertson	SO
G Slessor	SO
P Mackie	TRS
S Bromely	Shell (visitor)

Part 2

A H McVicar	PSO in charge
R Wooten	PSO
J W Smith	HSO
D C Moore	HSO
A D McIntosh	HSO
M R Robertson	SO
S Aitchison (Miss)	ASO
G Guthrie (Miss)	ASO
Miss C Fraser	ASO
R Bray	British Museum (visitor)
Miss J A Edwards, London	(Visitor)

Objectives

1. To investigate the distribution of hydrocarbons in sediments around Beryl and the East Shetland Basin, the Ferth Ferties line and the Beatrice oil field.
2. To trawl for commercial fish species for AHH analysis and taste panel assessment.
3. To monitor the Benthos of the Jansis line and the Beryl oil field.
4. To survey the Northern North Sea and north of the Scottish mainland to determine the prevalence of various pathological conditions and parasites of gadoids and flatfish.
5. Collection of water for radio-caesium analysis.

Narrative

"Scotia" left Aberdeen at 1600 hours on 3 May and made passage towards the Beryl oilfield. Sampling commenced at Beryl at 0900 hours on 4 May where 20 stations were occupied. Sampling was completed and settlement traps laid by 1900 hours on

5 May and passage was made to the Brent field via Minian where water samples and one sediment sample were taken. Sampling at Brent commenced at 1100 hours on 6 May and after 6 stations had been taken "Scotia's" propeller became fouled by abandoned fishing gear. "Scotia" was taken in tow by EPV "Westra" on 7 May and made passage to Leith arriving 10 May. After dry docking and cleansing the net from the propeller "Scotia" left Leith at 1400 hours on 12 May where sampling in the Firth of Forth commenced at 1530 hours and the Forth Forties line was completed with 5 trawl positions worked by 0400 hours on 14 May.

The remainder of the Beryl sampling and retrieval of the settlement traps was completed on 14 May.

Twenty one hydrocarbon and 2 trawl stations were taken around the Brent field between 1100 hours on 15 May and 0700 hours on 16 May on which day a long line was laid close to the Thistle 'A' platform and 3 trawl stations completed west of the Thistle oilfield.

Five trawl stations were sampled south - south east of Shetland on 17 May, the Jonsis line was sampled at 5 stations for macrobenthos (including 3 with trawls) with one additional trawl station east of Orkney on 18 May. A sick crew member was put ashore at 0900 at Scrabster on 19 May and between then and 20 May 9 trawl stations were worked off the north Scottish coast. The Beatrice field was sampled at 22 hydrocarbon stations and 7 trawl stations completed on 21-22 May. Water samples for radio caesium analysis were taken at 3 locations. "Scotia" docked in Aberdeen at 2030 on 22 May.

In spite of the problem with fouled propeller a total of 81 hydrocarbon, 5 macrobenthos and 38 trawl stations were completed, a total made possible by the excellent cooperation of the officers and crew of "Scotia".

#### Results: Hydrocarbon Monitoring

Twenty three stations were successfully sampled around the Beryl 'A' platform for hydrocarbon distribution in the sediment and benthic macrofauna. Settlement traps were deployed and recovered successfully after a period of 10 days in position.

total of 22 stations were sampled around the Brent oilfield. Nine stations were sampled along a line from the Bridges in the Firth of Forth to the Forties Field.

Twenty two stations were sampled successfully at the Beatrice platform. A long line laid close to the Thistle 'A' platform and retrieved after a period of 6 hours yielded few fish for AHH analysis. Samples of commercial fish species taken from trawls both close to oil installations and in areas of no oil related activity were collected for AHH induction analysis. Flesh samples were taken for taste panel assessment.

All samples were returned to the Laboratory in Aberdeen where analysis was carried out and some preliminary results are appended in Tables 1-4 for hydrocarbon concentration in sediments. Generally concentrations were in the same range as those previously sampled.

#### Pathology

Over 1370 haddock > 26cm from 31 hauls were examined for Lernaeocera, pseudobranch tumours and vertebral anomalies (by half filleting); in addition kidney samples

were taken for subsequent examination for Ichthyophonus infection. Over 1360 haddock <26cm from 28 hauls were examined for Lernaeocera, pseudobranch tumours and vertebral anomalies (by external inspection). In collaboration with Miss J Edwards, haemolymph samples were taken from gravid ♀ Lernaeocera on haddock, whiting and cod for subsequent comparison by iso-electric focussing. Blood samples were taken from Lernaeocera infected and uninfected haddock for comparison of haematocrit, haemoglobin content and white cell counts. Over 200 lemon soles from 28 hauls were preserved for subsequent examination for Lernaeocera and kidneys of over 200 plaice from 16 hauls for Ichthyophonus infection. 1656 dabs from 30 hauls were examined externally for various diseases and showed prevalence levels of 8% for Lymphocystis, 1.6 ulceration, 1.7 papilloma and 1.2 gill swelling.

A D McIntosh

H McVicar

18 February 1985

Seen in Draft: W Findlay, OIC

Table 1

Hydrocarbon Concentrations in Sediments (as oil equivalents by fluorescence) around the Beryl 'A' oil field May 1984.

Direction	Distance metres	Depth Profile cm	Depth metres	Oil equivalents $\mu\text{g g}^{-1}$ dry wt	
South	16000	0-2	111	18.92	
		2-4		22.35	
		4-8		15.79	
	8000	0-2	104	25.13	
		4800	0-2	111	38.17
	2-4			42.77	
	4-8			17.82	
	3200	0-2	116	51.55	
	1600	0-2	114	370.84	
		800	0-2	115	833.12
	2-4			239.76	
	4-8			57.29	
	500	0-2	114	3790.34	
		2-4		1412.00	
		4-8		154.07	
	200	0-2	115	420.07	
		2-4		72.46	
		4-8		35.09	
	North	1600	0-2	112	74.76
			0-2	116	849.96
		200	0-2	115	5431.37
2-4				2014.28	
4-8				102.55	
East	1600	0-2	115	34.53	
	800	0-2	115	49.71	
	200	0-2	115	401.89	
West	1600	0-2	114	33.44	
	800	0-2	115	43.44	
	200	0-2	115	74.75	
South (of spar bouy)	16000	0-2	111	25.86	
		2-4		27.07	
		4-8		31.68	
	3200	0-2	111	64.45	
	800	0-2	110	73.83	
	200	0-2	112	33.64	
		2-4		25.61	
		4-8		26.31	
	South east	1600	0-2	115	54.43
2-4				45.09	
4-8				30.81	
800		0-2	115	163.03	
		2-4		35.46	
		4-8		35.96	

Table 2

Hydrocarbon Concentration in Sediments (as oil equivalents by fluorescence)  
around the Brent oilfield, May 1984.

Direction	Distance metres	Depth metres	Oil equivalents $\mu\text{g g}^{-1}$ dry wt
North	8000	141	55.56
	4800	141	60.07
	3200	140	65.88
	1600	138	21.15
	800	137	120.32
	200	137	432.50
South	200	140	97.92
	800	136	71.30
	3200	136	78.63
	4800	134	83.44
	8000	135	62.73
East	4800	137	39.73
	3200	139	39.70
	1600	139	71.17
	800	139	81.08
	200	136	3019.34
West	200	137	127.51
	800	138	85.57
	1600	139	72.84
	3200	140	63.72
	4800	141	71.73
	8000	144	59.60

Table 3

Hydrocarbon Concentrations in Sediments (as oil equivalents by fluorescence)  
around the Beatrice oilfield, May 198

Direction	Distance metres	Depth metres	Oil equivalents µg g <sup>-1</sup> dry wt
North	3200	69	9.41
	1600	46	24.94
	800	45	19.42
	200	45	119.80
South	200	45	82.28
	800	44	20.56
	1600	43	10.50
	3200	43	7.96
	4800	46	18.25
	8000	50	8.41
East	8000	37	3.77
	4800	46	3.91
	3200	46	4.98
	1600	41	4.52
	800	41	6.59
	200	41	9.74
West	200	44	23.08
	800	47	13.04
	1600	50	13.41
	3200	52	19.84
	4800	52	11.54
	8000	59	19.02

Table 4

Hydrocarbon Concentrations in Sediments (as oil equivalents by fluorescence) along the:

1. Forth Forties line in May 1984

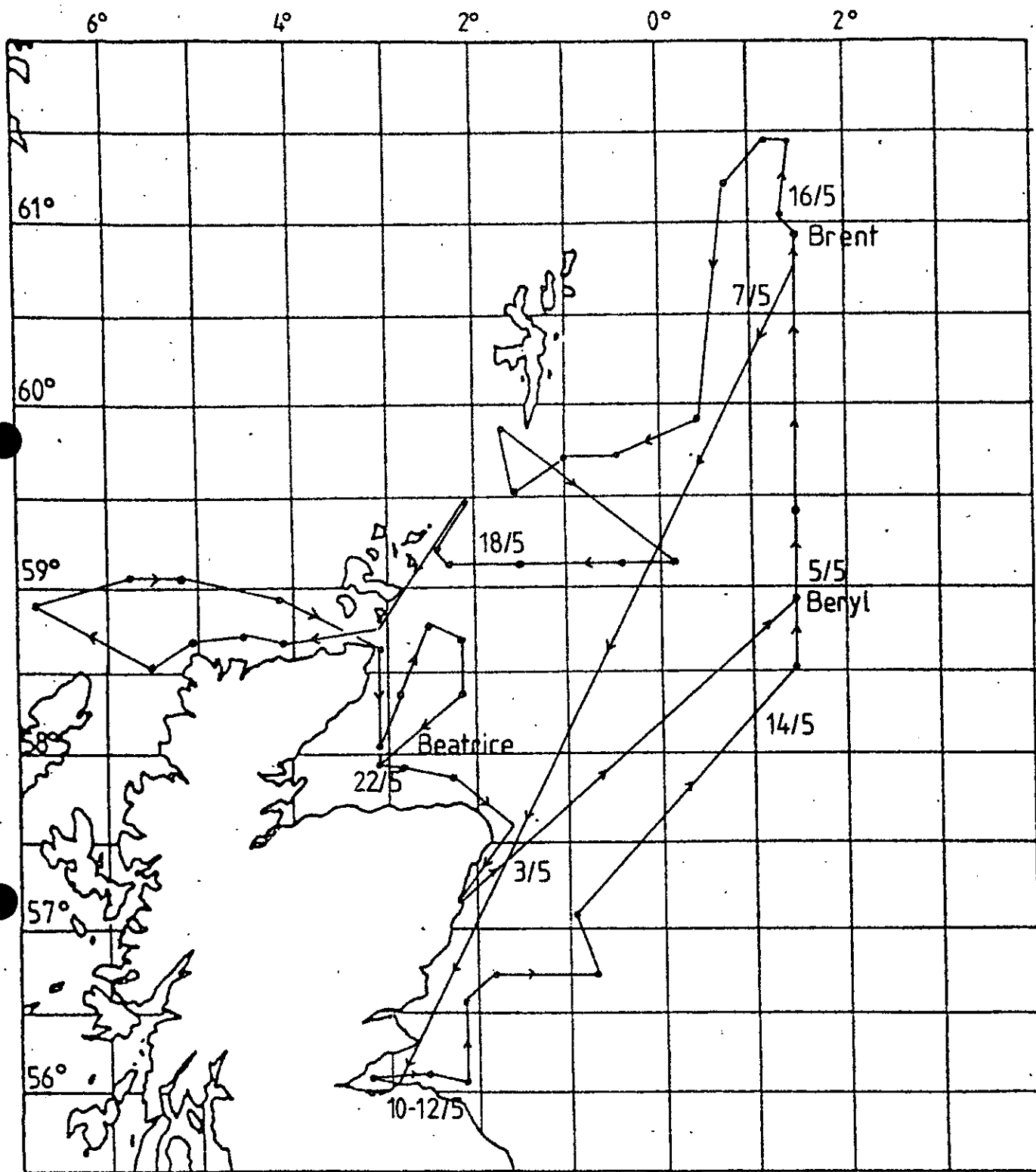
Position	Depth metres	Oil equivalents $\mu\text{g/g}$ dry wt
Bridges	70	1510.66
Hound Point	30	2249.87
Port Seton	38	3616.80
Bass Rock	21	193.83
Bett Rock	41	26.45
FFL1	55	6.42
FFL2	69	4.93
FFL3	76	4.17
Forties	111	23.13

2. Jonsis Line (Stns A, B, D, E) in May 1984

Jonsis A	87	5.62
B	99	4.18
D	132	18.68
E	141	17.65

3. East of the Ninian platform in May 1984

1000 metres	131	74.90
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