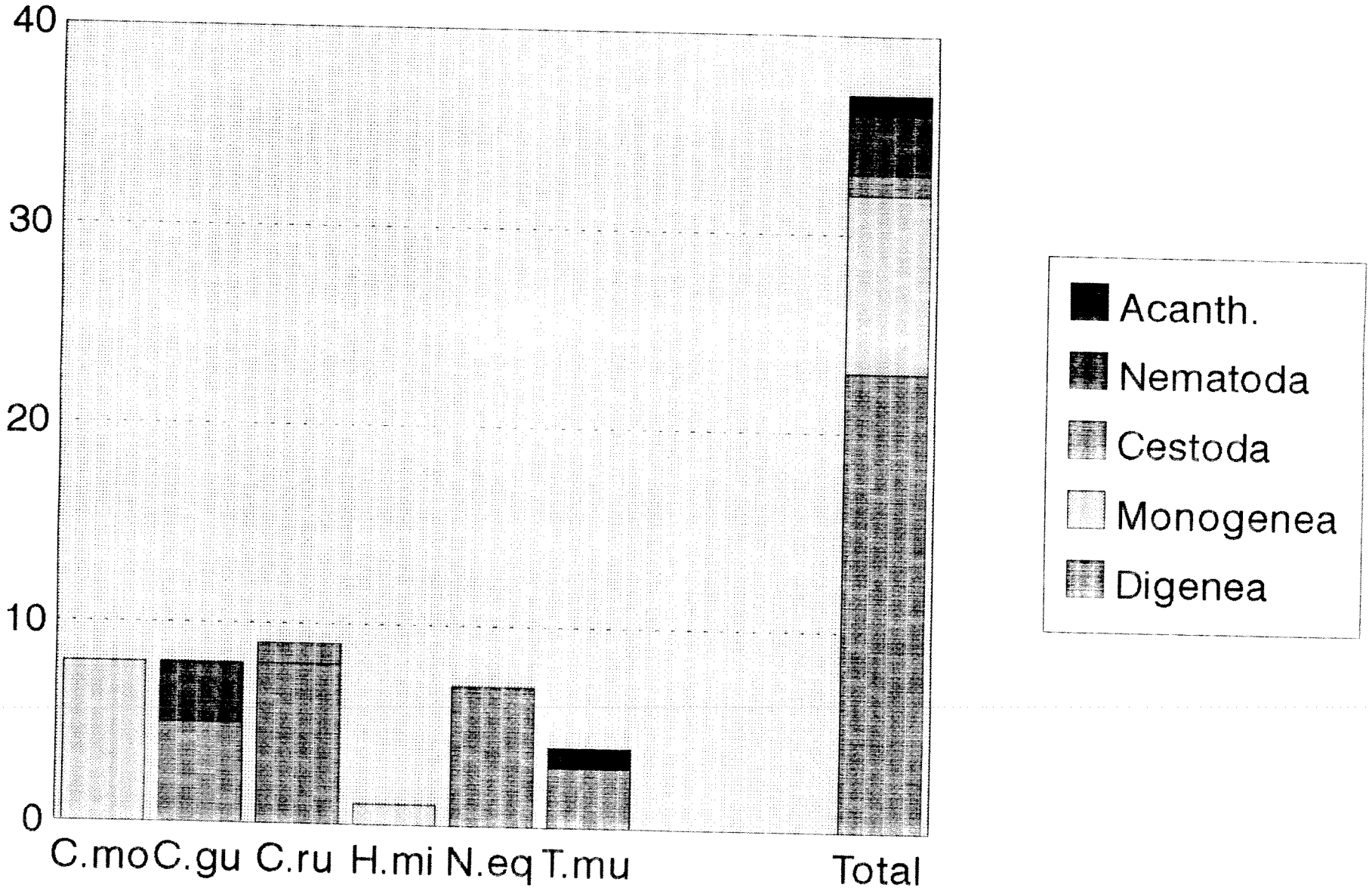
Parasites collected from fish on Challenger 89/92



R.R.S. Challenger Cruise 91, Leg 1

27 February - 7 March, 1992

This ship time has been allocated to the Scottish Marine Biological Association's Academic Research Project 2
"Structure, dynamics and the effect of disturbance on benthic and benthopelagic populations of the continental slope and rise"
The SMBA's research programme is grant-aided by the U.K. Natural Environment Research Council

Cruise report

Organic chemistry and bioenergetics of deep-sea echinoderms. P. A. Tyler & C. Bishop (NERC Grant GR3/8243).

Specimens which form the primary species in this project were collected at one or more of the stations samples. At station 89/92/1 Echinus affinis, Phormosoma placenta, Bathybiaster vexillifer and Plutonaster bifrons were collected in significant numbers. All specimens were frozen at -20° C in the ship's freezer and will be transported to Southampton from Barry. Of the secondary species that form part of the Grant Pseudarchaster parelli and Persephonaster patagiatus were collected in limited numbers and frozen also.

The second station 89/92/2 yielded a rich haul of echinothurids. Phormosoma placenta and Sperosoma grimaldi were abundant and Calveriosoma hystrix was collected in sufficient quantity for at least 25 individuals to be frozen. In addition specimens of a stalked barnacle from the spines of Poriocidaris purpurata were fixed in 8% formalin so the reproductive biology of this species could be compared with that of Poecilasma kaempferi. This station also yielded a collection of sipunculids which were injected with seawater formalin for later examination of their coelomic oocyte development.

The third station also yielded a number of secondary species for the Grant including Persephonaster and Pontaster tenuispinus. In addition there were large numbers of the echinoid Echinus elegans which is to be used as a comparator with E. affinis.

Reproductive biology of Anthozoans. S.K. Bronsdon & P.A. Tyler

At all three stations there were good collections of various species of anmemone. At St 89/92/1 specimens of Amphianthus associated with the

gorgonian Acanella were taken in the trawl. These were either frozen or preserved in 8% seawater formalin. Large anemones Phelliactis spp. were dissected and either frozen or fixed. A single specimen of Umbellula was frozen and two specimens of Pennatula preserved in 8% seawater formalin.

At stations 89/92/2 and 89/92/3 large anemones were found and these were treated in the same way as those from the first staion. ~~The~~ A anemone ~~2D[illegible]actiis~~ sp. associated with gastropod shells was also taken at these stations. These were preserved for reproductive study. At station 89/92/2 a small specimen of Umbellula was taken and frozen whilst at station 89/92/3 a considerable number of the zoanthid Epizoanthus paguriphilus were taken. As the histology of gonad development is known for this species all the specimens were preserved for biochemical examination.

Larval Development. C.M. Young & P.A. Tyler

Intact specimens of Echinus affinis were obtained from station 89/92/1. These were injected with 0.55M KCl and most spawned. Cultures were set up using 5 females and five males and the cultures placed in plastic scintillation vials and one vial of each culture incubated at 1, 50, 100 and 200 atmospheres for 12h at 6° C. At the end of ther incubation period the number of embryos at the different cleavage stages was noted for each culture. The most developed embryos were from 200ats whilst those at 1 and 50 ats were, at maximum, at the two-cell stage (Fig. 1). This is the first evidence that pressure is a necessary requirement for successful cleavage in a deep-sea invertebrate. The embryos at 200ats were examined every 24h and had reached the ciliated blastula stage at 108h. They were left at pressure until they could be examined when 'Challenger' docks in Barry.

At station 89/92/3 a large collection of Echinus elegans allowed us to

repeat the experiment but using a lower shelf and upper bathyal species. After 12h incubation the embryos had reached the 16-cell stage at 1, 50 and 100ats but only deformed 8-cell embryos were observed at 200ats. The cultures were continued at 1at. in the cold room at SMBA after docking in Oban and had reached the morula stage by 108h. These data suggest that the zonation of invertebrates in the deep sea may be determined, inter alia, by the depth at which successful embryonic development takes place.

RRS Challenger 89/92 Cruise Report Sonia Batten.

24 *Synaphobranchus kaupi* were collected from each of the three OTSB trawls. These were measured (length) and dissected on board, the liver frozen and portions of the gut and gonads fixed in Bouin's. The liver tissue will be biochemically assessed for glycogen content and the gut and gonad tissue will be histologically examined. 24 *Coryphaenoides guentheri* were collected from the 2200 m trawl and dissected as above. This species was not present in the two subsequent trawls and so 24 *C. rupestris* were collected and frozen for dissection in the lab.

Holothurian material was also obtained for Lawrence Hawkins. 9 individuals of *Laetmogone violacea* were collected from the 1200 m trawl and samples of coelomic fluid were extracted and frozen. 6 individuals of *Stichopus tremulus* caught in the 800 m trawl were similarly treated. Portions of the body wall of both species were frozen for biochemical analysis.

6 decapods (species as yet unknown) were obtained from the 1200 m trawl and frozen for comparison with previous biochemical studies.

CRUISE 89/92 : WORK REPORT.

This cruise provided an opportunity to study the deep demersal ichthyofauna of the Rockall Trough. My objectives were firstly to obtain shark specimens for taxonomic and morphological study and secondly to gain familiarity with the general species composition of trawled bony fishes from different depths.

My first objective was achieved with the collection of five sharks (2 species) which were photographed, dissected and suitable tissues frozen for later examination at the Natural History Museum, London.

My second objective was achieved during sorting and documenting catches. Advice with identifications was provided by Nigel Merrett and John Gordon. Detailed notes have been kept and representative specimens from each of the important families examined in detail, with particular attention given to the Gadiformes and Alepocephalidae.

F. N. H. WALLER 6th MARCH 1992.

Challenger Cruise (Leg 1) 27 Feb to 7 March 1992

From Dunstaffnage Marine Laboratory

Dr J D M Gordon — Chief Scientist PSO
Dr J D Gage
Mr R H Harvey
Mr P Lamont

From Department of Oceanography, Southampton University.
Dr P A Tyler
Ms S K Bronsdon
Ms S Batten

From Natural History Museum
Mr N R Merrett
Ms M Spencer Jones
Mr xxxxxxxxxxxxxxxx
From Harbor Branch, Florida
Dr C M Young

From University of New Hampshire
Dr R Olson

JDS

RVS Sailing Instructions **RVS Ref: P12/89/92**

RRS CHALLENGER: CRUISE 89/92 : 27 February - 17 MARCH 1992

To: The Master

1. **Ship's Programme:**

a) RRS CHALLENGER is to sail from Dundee on Thursday 27th. February 1992 with members of Dunstaffnage Marine Laboratory and Southampton University Department of Oceanography for a Benthos/Biology and Physical Oceanography cruise in the Rockall Trough and NW approaches as required by the Principal Scientist(s). The cruise will consist of two legs.

b) The outline schedule is given below:

Wednesday 26th February	: :	Load equipment.
	:1500:	Embark scientific party.
Thursday 27th February	:a.m.:	Sail from Dundee for leg 1.
Saturday 7th March	:a.m.:	Mid cruise portcall at Dunstaffnage/Oban to change scientists. End leg 1, commence leg 2.
Tuesday 17th March	:a.m.:	Arrive Barry. Scientific party disembarks. Unload equipment. (H.W. 0526z)

2. **Scientific requirements:**

a) It is required:

Leg 1. To sample the benthos and benthopelagic fish of the Rockall Trough for seasonal and interannual studies.
Leg 2. To obtain temperature and salinity profiles and water samples between Scotland and Rockall.

b) Equipment to be used will include:

Leg 1. Epibenthic Sled, Box-corer, Agassiz trawl and Marinovitch Semi-balloon trawl.

Leg 2. CTD profiler, water-sampling bottles, recording current meters. Subsurface current meters with a surface spar buoy will be laid in approximate position: 56 37N, 06 24W.

c) DML and SUDO equipment will be loaded at Dundee on Wednesday 26th. February and unloaded in Barry on 17th. March.

3. **Scientific party:**

Leg 1:

Fm: Dunstaffnage Marine Laoratory

Dr J D Gage — Principal Scientist
Dr J D M Gordon
Mr R H Harvey
Mr P Lamont

Fm: Department of Oceanography, Southampton University

Dr P A Tyler
Ms S K Brondson
Ms S Batten
C. Bishop

Fm: Natural History Museum

Mr N R Merrett
Ms M Spencer-Jones
A N Other — M.G. Walker

Fm: Harbour Branch, Florida

Dr C M Young

Fm: University of New Hampshire

Dr R Olson

4. **Agents:**

Barry: Research Vessel Services
Barry
No 1 Dock
Barry
S Glam
CF6 6UZ

Tel: (0446) 737451
(24 hours)
Tlx: 497101 RVBASE G
Fax: (0446) 720562
E. Mail: RVSOPS@UK.AC.NWL.1A

Dundee: Barrie & Nairn
49, Meadowside
Dundee
DD1 1EH

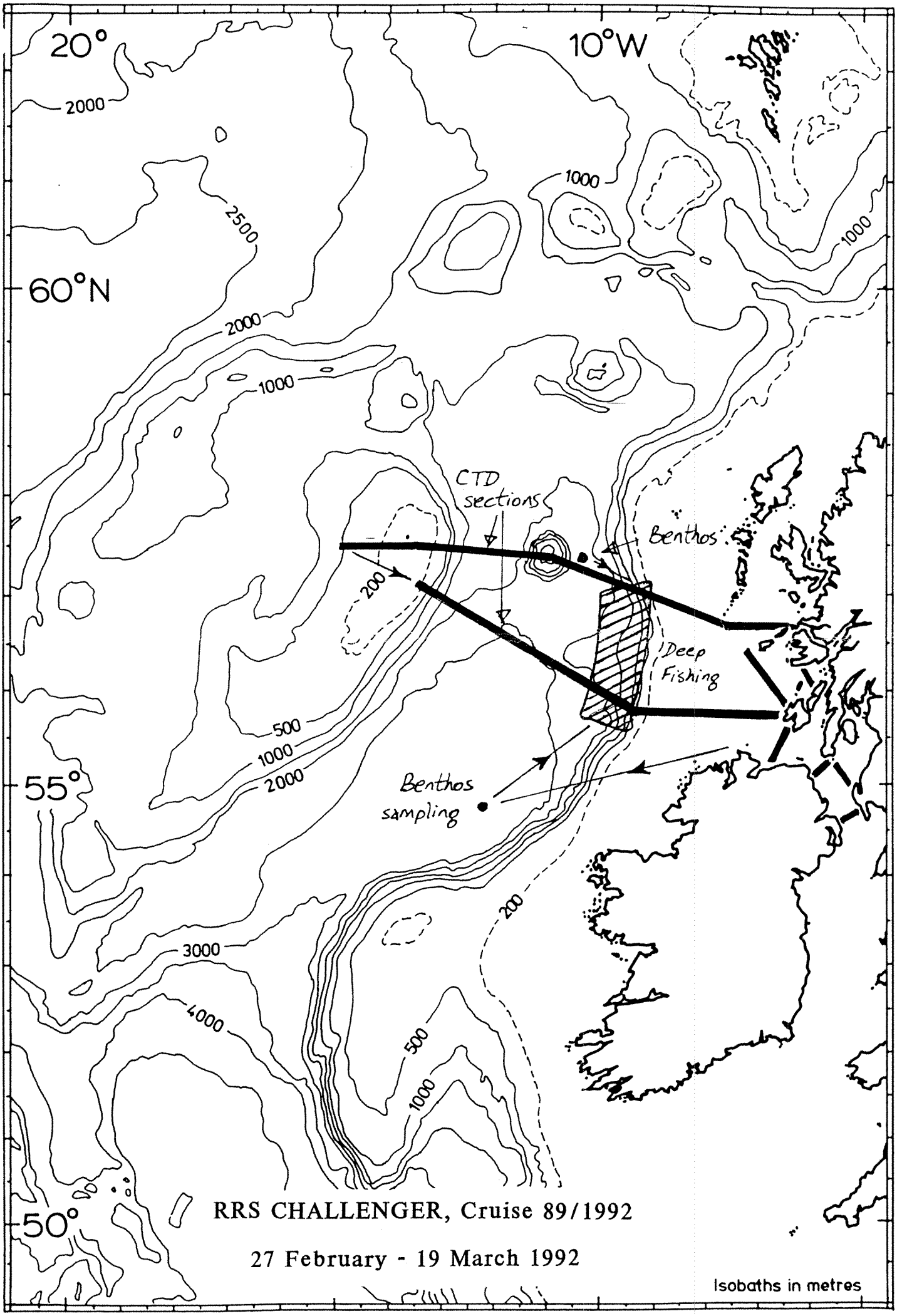
Tel: (0382) 23044/5/6/7
Tlx: 76177
Fax: (0382) 201383

5. **Special Instructions:**

a) The scientific party are reminded of the requirements to provide their own personal protective equipment in the form of safety helmets and safety footwear.

Dr C W Fay
Superintendent RVS

5 February 1992


20°
10°W
60°N
55°
50°
2000
2500
1000
500
200
3000
4000
CTD sections
Benthos
Deep Fishing
Benthos sampling
RRS CHALLENGER, Cruise 89/1992
27 February - 19 March 1992
Isobaths in metres

NRM main objectives:-

1. To obtain hydrated eggs from macrourid species to supplement an SEM study of chorion microstructure in the family. In the event, eggs were collected from five species.

2. To obtain a size series of otoliths of abundant slope-dwelling fish species at various soundings to further a study of chemically-coded life history patterns from otolith analysis. Samples were collected from 15 eff. over the sounding range sampled.

3. In addition, a small collection of rare & unusual fish species were collected for incorporation in the collections of the Natural History Museum, London.

Mary E. Spencer Jones
Department of Zoology, The Natural History Museum, London)

10.03.1992

Parasitological studies

Deep-sea fish collected by OTSB trawl from stations 89/92/1,2 & 3 were examined. Thirty-seven fresh specimens of six species were dissected and the helminth parasites were removed. Material was fixed in 100% with a view to undertaking DNA sequencing. The results are summarised in the following table.

Fish host	Number dissected	No. of tubes collected of major parastic groups				
		D	M	C	N	A
Chimaera monstrosa	9	0	8	0	0	0
Coryphaenoides guentheri	5	5	0	0	3	0
Coryphaenoides rupestris	5	8	0	1	0	0
Hydrolagus mirabilis	9	0	1	0	0	0
Nezumia equalis	3	7	0	0	0	0
Trachyrhynchus murrayi	1	3	0	0	0	1
Total	37	23	9	1	3	1

Key

D=Digenea
M=Monogenea
C=Cestoda
N=Nematoda
A=Acanthocephala

Porifera

Sponge material was collected by OTSB trawl from stations 89/92/2 & 3. Three specimens of two species were found and their distribution records will be used in the Linnean Synopses of British Sponges.

R.R.S. CHALLENGER CRUISE 89 CREW LIST DEPART DUNDEE THURSDAY 27TH FEBRUARY 1992

NO	NAME		RANK	NATIONALITY	DIS.A./PASSPORT NUMBER	DATE OF BIRTH	PLACE OF BIRTH
01	Geoffrey Michael	LONG	MASTER	BRITISH	R.755730	11/04/44	LONDON
02	Philip	EVANS	CH.OFF	"	UK.035710	21/07/59	HAVERFORDWEST
03	Sydney	SYKES	2ND.OFF	"	R.654878	17/07/40	GRIMSBY
04	John	SANDERSON	3RD.OFF	"	UK.074821	17/03/67	ROCHDALE
05	Paul Edward	JAGO	CH. ENG	"	UK.003968	11/01/55	SOUTH SHIELDS
06	Bernard	MCDONALD	2ND.ENG	"	UK.003017	20/03/55	LIVERPOOL
07	Alexander	GREENHORN	3RD.ENG	"	R.913905	30/07/52	GLASGOW
08	Clive	PHILLIPS	3RD.ENG.	"	R.832722	06/12/45	CARDIFF
09	Robert	MACDONALD	CPO(D)	"	R.626981	18/05/38	GLASGOW
10	Thomas Gregory	LEWIS	Sm.	"	UK.037529	25/10/58	GERMANY
11	Andrew	MACLEAN	Sm.	"	UK.068915	07/04/64	FALMOUTH
12	Christopher	VRETTOS	Sm.	"	UK.060226	05/02/63	CARDIFF
13	Arthur George	SCRIVEN	Sm.	"	R.509960	03/04/28	GLOUCESTER
14	Peter Robert	BENNETT	Sm.	"	R.688537	10/11/41	CARDIFF
15	Clive Keith	PERRY	CPO(C)	"	R.894312	14/05/53	RHONDDA
16	Julian John	SWENSON	COOK	"	R.902352	08/09/55	BRISTOL
17	Jeffrey Alexander	ORSBORN	2ND.STWD	"	R.862032	25/06/48	WESTMINSTER
18	Walter John	LINK	STWD	"	UK.035709	13/12/61	PORTSMOUTH
19	Victor George	HILL	Mm.1.A.	"	R.779057	12/05/42	BOURNEMOUTH
20	J	GAGE	PSO	"		14/11/39	SALISBURY
21	J.	GORDON	SCIENTIST	"		17/12/42	EDINBURGH
22	R.	HARVEY	"	"		29/09/52	REDRUTH
23	P.	LAMONT	"	"		11/12/50	BELFAST
24	P.	TYLER	"	"		17/07/46	BUSHEY
25	MS S	BRONDSON	"	BRITISH		31/07/67	OXFORD
26	MS M	SPENCER JONES	"	"		20/03/62	CYPRUS
27	C	YOUNG	"	USA		20/08/52	UTAH
28	MS S	BATTEN	"	BRITISH		01/05/69	SALISBURY
29	N.	MERRETT	"	"		11/03/44	HAVANT
30	G Westbrook	WALLER	"	"		25/07/55	TUNBRIDGE WELLS
31	R.	OLSON	"	USA		03/10/55	GERMANY
32	C.	BISHOP	"	"		10/04/68	NOTTINGHAM
33			"			/ /	

OFFICERS	8
CREW	11
SCIENTISTS	13
TOTAL	32

.....Master.

ROUGH LOG SHEET

SMBA / GAGE. 09

WAP F374

Time Zone: GMT Ship: RRS Challenger Cruise 88/92 ~~UEA~~/~~RHL~~/~~NIGHTINGALE~~

Time	Log	Lat N	Long W	Method				REMARKS
000								"ABERTAY" 088°T x 2.3 <FAOP>.
015								"ABERTAY" 000°T x 0.1 M/C 051°T.
~~023~~								~~MIDDLE 000°T x 0.1 M/C 012°T.~~
030								"FAIRWAY" 140°T x 0.2 M/C 035°T.
200								"SCURDIE NESS" LT. HO. 280°T x 3.1.
310								"TODHEAD PT." LT. HO. 320°T x 3.0 M/C 022°T.
400								"GARRON PT" 270°T x 4.0
100.								Girdle Ness Lt 266°T x 4.2.
200		57°18.9	1°47.0					
234.								Buchan Ness Lt brg 270°T x 2.9 a/c 000°T.
335.								Rattray Hd Lt brg 270°T x 4.8 a/c 326°T.
400.								— " — 218°T x 4.1
500								KINNAIRDS HD Bg 193°T @ 7.6'
606		57°41.6	2°00.1	Decca.				
700		58°05.3	2°17.5	"				
800.		58°14.2	2°27.5	"				
900		58°22.7	02°38.5	+				"DUNCANSBY HEAD" 323° x 19.5
000								"DUNCANSBY HEAD" 320°T x 9.4
040								"DUNCANSBY HEAD" 300°T x 2.7 M/C 317°T.

ROUGH LOG SHEET

Time Zone Z Ship "CHALLENGER" CR 89/92' SMBA/CAGE WAP F374

Time	Log		N LAT	W LONG	METHOD			REMARKS
00								"LATHER ROCK" 032°T x 3:5
12								"SWEETNESS PT" 229°T x 1:0 M/C 267°T.
200			58° 42:1	03° 23:4	DECCA DGC			
400			58° 41:1	4° 01:8	GC.			Strathy Pt. abm x 5:1.
443			41:2	14:5				a/c -242°T. Zulu
500			58° 40:6	18:6				
1600			36:7	32:0	GC.			M/V Hove to, Loch Eriboll — Strathy Pt Lt. dim bad weather
1700			58° 36:4	4° 24:2				
800			58° 36:4	4° 18:4				
900			58° 36:3	4° 09:6				
1000			56° 36:3	4° 13:0				"STRATHY PT" 090°T x 6:1
1200			56° 36:4	4° 17:4				" 090°T x 6:4
300			56° 36:7	4° 22:2				" 090°T x 11:0
1400			56° 36:7	4° 24:4				" 090°T x 12:3
238			58° 36:3	4° 05:9				a/c -270°T Strathy Pt Lt. 093°T x 2:5
1400			58° 36:8	4° 12:8				
1600			58° 36:3	4° 23:0				
1800			58 36:2	4 28:5				
1820			36:3	26:3				S/C 220°T. "STRATHY PT" 090°T x 12:0

ROUGH LOG SHEET

Time Zone Z Ship "CHALLENGER" CR 89/92' SMBA/EAGLE WAP F374

Time	Log		N LAT	W LONG	METHOD			REMARKS
9.10			58° 38.4'	04° 39.3'	DECCA			RETURN TO SHELTERED WATERS "FIRTH OF HEAD" 240°T x 4.2
2000			58° 37.8'	04° 34.1'	"			
00			58° 36.6'	04° 30.2'	"			
700			58° 36.4'	04° 27.6'	"			
300			36.4'	24.6'	"			Set Co. 280°T. Proceeds towards Cape Wrath
400			58° 38.2'	4° 39.6'	"			
500			58° 39.4'	4° 55.4'	"			
1519								Cape Wrath Lt brg. 180°T x 2.0 a/c - 224°T.
630			58° 36.1'	5° 07.2'	"			
730			58° 32.4'	5° 14.1'	"			
800			58° 31.0'	5° 17.4'	"			
1930			58° 24.2'	5° 28.3'	"			
2000			58° 22.0' 3.0	5° 32.5' 17.4	"			
2100			58° 17.5'	05° 41.4'	"			"STOERHEAD" Lt. Hse 108°T x 9.5
2200			58° 12.5'	05° 50.4'	"			
2300			58° 06.6'	06° 00.6'	OBE			"KEBACK HD" 260°T x 10.8
0400			58° 00.2'	06° 12.2'	"			
0019								Sgianach Pt. (Herwig) brg. 298°T x 4.0 a/c 240°T.
0100								Eilean Glas Hd (Scalpay) brg. 240°T x 6.4.

ROUGH LOG SHEET

Time Zone 92 Z Ship CHALLENGER. C89/92. SMBA/GAGE.

WAP F374

Time	Log	LAT. N	LONG W	METHOD				REMARKS
106.	-							Eilean Glas Lt bng. 244°T x 5.4 a/c 220°T.
200								— " — 011°T x 3.8
300								Increased x 200 rpm.
352								Weavers Lt bng 310°T x 3.5 a/c - 189°T.G.
400.								— " —
500		57°23.3'	7°04.4'	Decca				
1530.				Radar				USHENISH LT. Ho. bg 259°T @ 3.2'
600		57°13.7'	7°07.4'	Radar.				
700		57°08.6	7°09.6	Decca.				
1800		56°55.2	7°19.4	"				
912		56°45.4	07° 31.2	+				"BARRA HD" 290°T x 3.9 M/C 232°T.
925		~~45.6~~	~~52.8~~					"BARRA HD" 330°T x 3.4 M/C 281°T.
030		56° 45.6	07° 52.8	+				"BARRA HD" 085°T x 8.4
200		56° 48.3	08° 16.5	+				
300.		56° 50.4	8° 31.3	- " -				
1412		56° 52.8	8° 49.0	"				
1500		56° 54.1	9° 00.2	- " -				
1600		56° 55.8	9° 14.6	- " -				
1700		56° 57.4'	9° 30.1	"				

ROUGH LOG SHEET

Time Zone 2 GMT Ship Challenger Cr 89/92 GAGE/DML

WAP F374

Time	Log	lat N	lon W	Method				REMARKS
830		56 59.7	9 49.6	Decca	8E			On station slow to 1½ k
840		56 59.7	9 50.1	"				Shooting OTSB.
845		56 59.7	9 50.4	"				Inc to 3k
853								Inc to 4k
2000		57° 00.6	10° 01.2'	"				
2025		57° 00.9	10° 04.2	"				STOP TIMING OUT., 6500 m, SLOW UP.
2040		57° 01.2	10° 04.5	"				NET ON THE BOTTOM 2½ KTS
2115		57° 01.8	10° 09.8	GPS				START HAULING.
2126		02.8	14.4	"				Doors in B.
2131		57° 02.8	10° 15.5	"				Net in B. Up Home & Sorting Samples
2148		57° 03.2	10° 19.3	"				Decks cleared & Secured Set Co. 105°T x 6 Spd
2300	—	56° 59.0	9° 59.4	"				
2400	—	56° 56.8	9° 44.4	"				
0500		56° 54.1	9° 21.2'	"				
0600		56 52.3	9 03.3'	"				
0700		56 50.1	8 46.1	"				
830		56° 46.7	08° 19.7	DECCA OSE				"BARRA HD" 090°T x 21.3
900		56° 43.6	07° 52.8	"				"BARRA HD" LT. 065°T x 7.7
940		56° 42.4	07° 41.7	"				"BARRA HD" LT 210°T x 4.5 M/C 060°T.

ROUGH LOG SHEET

WAP F374

Time Zone Z   Ship "CHALLENGER"   CR 89/2   SMBA/EACE

Time	Log		N LAT	W LONG	METHOD			REMARKS
.17			56° 45'.0	07° 32'.3	DECCA 08E			"BARRA HD" 290°T x 3.6 A/C 033°T.
00.0			56° 50'.8	07° 25'.2	"			
330.			57° 03'.6	7° 09'.1	"			a/c - 000°T. Reduced spd. to Sheltering in lee of S. Uist
500			57° 12'.6	7° 08'.4	"			
530.			57° 15'.4	7° 08'.6	GPS			a/c - 180°T.
630			57 11.8	7 07.6	"			
800			57° 08.3	7° 06.4'				
900			57° 07.8'	7° 06.1'	GPS			
21.00			57° 15'.1	07° 09'.4	"			
230.0			57° 12'.1	07° 09'.3	"			
2400			57° 10'.4	07° 09'.7	"			
0200.			57° 07'.1	07° 08'.1	— " —			
0300.			57° 05'.1	07 08'.8	— " —			a/c - 000°T.
0400.			57° 08'.4	7° 08'.4	— " —			
0630			57 14.0	7 08.3	GPS.			
0718			57 11.3	7 08.3	"			Inc full sea speed towards trawl site.
0756			57 05.0	7 09.5	"			A/C 211°T. 221°(C)
29.00			56° 55'.6	07° 20'.6	"			
29.25			52'.0	24'.8	"			"ROSINISH" 255°T x 4.5 HOVE TO. E.R. ACCIDENT.

WAP F374

ROUGH LOG SHEET

Time Zone Z   Ship "CHALLENGER"   CR 89/92'   SMBA/GAGE.

Time	Log		N LAT	W LONG	METHOD			REMARKS
935			56° 51.6	07° 25.0	GPS			C/ S/C 105°T FULL SPD FOR OBAN.
200			56° 50.4	07° 18.4	"			
100			56° 48.0	07° 00.0	"			
200			56° 45.4	06° 41.5	"			
230			56° 44.2	6° 32.0	"			
249.								Cairns of Coll. abm x 0.7' a/c 109°T.
352								Ardmore Pt. abm x 0.45' a/c 118°T.
405								Rubha na Gall. Lt. abm x 0.4' a/c 143°T.
452								Eileanan Glasa Is Lt brg 143°T x 0.8' a/c 110°T.
537.								Glas Eileanan brg 175°T x 0.53' a/c 140°T
1605								Lady's Rock 030°T @ 0.44' A/c 100°T
755								BACH Is. (KERRERA) 160°T @ 1.06' A/c 218°T
1845								DUBH FHEITH Is (FIRTH OF LORNE) 119° @ 1.84' A/c 252°T 259
1900								FRANK LOCKWOOD'S ISLAND 006°T @ 2.53'

ROUGH LOG SHEET

WAP F374

Time Zone GMT Ship Challenger GAGE / DML

Time	Log	lat N	lon W	Method				REMARKS
?00		56 13.2	6 07.6	GPS.				
?0??								"DUBH ARTACH" 255°T x 10'.6 A/C ~~287°T~~ 274°T
?200								"DUBH ARTACH" 152°T x 3'.6
?300								"SKERRYVORE" 328°T x 8'.8
?330								"SKERRYVORE" 358°T x 7'.1 A/C 282°
?400								"SKERRYVORE" 035°T x 7'.1
?100.		56° 15'.9	7° 28'.9	GPS.				
?200.		56° 17'.2	7° 42'.8	— " —				Reduced to 160 rpm. to reduce heavy pounding
?242		18'.1	50'.6	— " —				a/c - 025°T. to proceeds for shelter to Little Minch
?300.		20'.6	48'.2	— " —				
?400.		56° 29'.1	07° 39'.8	— " —				
?500		56° 38.3'	7° 32.3'	"				
?600		56 48.3	7 25.0	"				
?800		56 56.5	7° 16.3'	"				
?9.00		56° 54'.7	07° 17'.1	x				
?.00		56° 54'.6	07° 18'.0	x				
.00		56° 58'.1	07° 16'.4	x				
?.00		~~56~~ 57° 01'.6	07° 13'.1	x				
2247.								Hartamul Is brg 286°T x 2'.5 to Hove to head to wind

ROUGH LOG SHEET

Time Zone 72 Z Ship CHALLENGER. 89/92 SMBA/GAGE

WAP F374

Time	Log	LAT. N	LONG W	METHD				REMARKS
1000	—	57° 00·7	07° 11·0	GPS				Vh in Sheltered Waters.
1100	-	56° 58·3	7° 12·7	-u-				
1200		56° 57·3'	7° 13·4'	u				
1300		56 57·0	7 13·8	u				
1330		56 56·8	7 14·1	u				Tmm proceeding 040° T
1400		57° 01·3	7° 09·2	"				A/C 000° T
1500		57° 12·2'	7° 08·3'	u				
2020		57° 16·0	07° 08·5	~				HEAVE T.O. "FISHERMAN" 325° T x 2·5
2100		57° 15·1	07° 08·3	~				
2200		57° 13·2	07° 08·6	~				
2300		57° 10·8	07° 08·5	~				
2400		57° 09·5	07° 08·3	~				
0230	-	57° 04·6	07° 09·0	-u-				A/C - 000° (T)
0400	—	57° 11·3	7° 09·1	—				
0440		57 14·6	7 08·9	"				A/C 180° T
0607		57° 05·1	7 09·4	u				A/C 213° T. Proceeding towards trawl site.
0700		56 57·4	7 17·3	u				
0800		56 48·5'	7 26·6'	-				
0825		56° 45·4	07° 30·9	~				"BARRA HD" 295° T x 1·1 M/C 257° T.

⊘

ROUGH LOG SHEET

Time Zone Z   Ship "CHALLENGER"   89/92'   SMBA/GAGE   WAP F374

Time	Log		N LAT	W LONG	METHOD			REMARKS
900			56° 43'.8	07° 41'.4	GPS			"BARRA HD" 035°T x 3'.4
1000			56° 41'.2	07° 59'.9	"			"BARRA HD" 062°T x 12'.4
1100			56° 38'.7	08° 17'.7	"			
1200			56° 36'.4	08° 35'.5	"			
1300			56° 34'.4	8° 52'.7	"			
1400			56° 32'.5	9° 09'.2	—"—			
1448			56° 30'.3	9° 21'.2	—"—			Reduced to 1.5-2.0kts for net Stn 2
1453			56° 30'.3	9° 21'.5	—"—			Comm deploying gear.
1458			56° 30'.3	9° 21'.8	—"—			Net o/B.
1459			56° 30'.3	9° 21'.9	—"—			Doors o/B
1501			—"—	—"—				a/c - 200°T ~~Comm paying out.~~
1506			56° 30'.2	9° 22'.0				Inc to 3.5 Kts.
1507			—"—	—"—				Comm paying out.
1600			56° 27'.6	9° 24'.5				Stopped paying out. ~~Comm hauling net~~
1707			56 25.6	9 27.0	GPS			Comm hauling. Net off bottom.
1822			56° 25'.4	9° 28'.9				Net I/B. V/L Hove to, clearing decks.
1900			56° 27.7	9° 31.6'	GPS			
2030			56° 28'.3	09° 32'.2	"			S/C 060°T TO 3RD TRAW STN.
2035			56° 30'.0	09° 14'.0	"			V/L MEMAVES T.O.

ROUGH LOG SHEET

WAP F374

Time Zone Z   Ship "CHALLENGER"   CR 89/92' & SMBA/ GAGE

Time	Log	N LAT	W LONG	METHOD				REMARKS
2.18		56° 30.22	09° 11.56	GPS				TRAWL O/B C0270°T.
230		56° 29.7	09° 11.9	"				PAYING OUT WIRE 3½ KTS
322		56° 26.98	09° 12.68	"				+ ON BOTTOM. STOP PAYING OUT 2½ KTS
0033	-	56° 24.4	09° 12.4	-"-				Comm hauling
0056	-	23.6	12.2	-"-				Net off bottom a/c Hd to wind 250°(T)
0130		23.3	13.4					Comm recovering net.
38		-"-	9° 13.7					Doors I/B.
0140.		—— "	——					Net I/B. V/L Hove to Sorting Samples
0312.		56° 23.5	9° 13.8					Decks + Labs all Secured set Co 078°T.
0330	-	56° 24.1	9° 12.5					
0400.	-	56° 24.9	9° 05.6	GPS.				
0500		56° 26.2'	8° 49.6'	GPS.				
0600		56° 27.4	8° 34.7	"				
0700		56° 29.3'	8° 20.1'	"				
0900		56° 33.0	07° 52.2	"				
0000		56° 35.0	07° 38.8	"				
1.00		56° 37.2	07° 25.8	"				
200		56° 38.8	07° 13.3	"				

Stan Smith Jpivend 3/2/92

(1) Owen sails are making a new AT net.
Can we check with them nearer the cruise.

(2) Andy Watson (PML) finishes in Dundee with a chemistry container on board (20 foot)
Can we leave it on board for the cruise after ours?

(3) Can you confirm that the box corer is not required.

-JOURNAL- DATE 08-JUN-1993 ----- TIME 11:07 ---------

NO.	COM	PAGES	DURATION	X/R	IDENTIFICATION	DATE	TIME	DIAGNOSTIC
21	OK	01	00:00'32	XMT	T 0703593059	08-JUN	11:07	800450AC7820

-D.M.L. OBAN -

0631 65518- ----------