Scientific Personnel:

Dr. D.S. Cronan	Imperial College
Mr. P. Smith	"
Mr. Tony Moorby	"
Mr. M. Horder	"
Mr. M. El Zawahry	"
Mr. R. Williams	"
Mr. C. Winter	University of East Anglia
Dr. H. Backer	Preussag AG
Mr. H. Pascher	"
Mr. P. Hillary	RVB
Mr. T. Cummins	"

Cruise Dates:

May 26th 1975 - June 4th 1975
June 9th 1975 - June 21st 1975

Cruise Area:

Northwestern Indian Ocean

a) Cruise Objectives

The objectives of the cruise were threefold:

i) To obtain samples of manganese nodules, encrustations, sediments and bottom waters at increasing distance from the crest of the Carlsberg Ridge, in order to evaluate the roles of metal source and environment of deposition on nodule geochemistry.

ii) To look for metalliferous sediments and deposits of hydrothermal origin in the median valley of the Carlsberg Ridge.

iii) To obtain a continuous air-gun profile over the Carlsberg Ridge.

Shackleton was to sail in more or less a straight line from Bombay to the Seychelles, along the old line surveyed in 1962 by HMS Owen. Detailed studies were planned for Discovery areas 4A and 4C.

b) Duration

Shackleton left Bombay three days late at 12.30 on May 26th and arrived in Port Victoria, Seychelles, at 18.00 on June 4th. She departed Port Victoria at 23.00 on June 9th and returned on June 21st. Sea conditions were near ideal throughout the cruise, the expected onset of the south-west Monsoon being avoided. Choppy conditions were encountered south of the equator during the last two days of the cruise, but this did not hamper ship's operations.

c) Conduct

Our late departure from Bombay was due to problems with the ships refrigerators. They could not be brought down to a low enough temperature to allow food to be taken on. This was rectified by new parts being manufactured locally. This delay caused the abandonment of our proposed first station, and we sailed directly for our proposed second station.

We arrived at proposed station 2 (Sh 1298) on 30/5/75 and commenced dredging and coring. Thereafter, we occupied stations along the original proposed track up to the crest of the Carlsberg Ridge. During these operations we used a dredge, gravity corer, Reineck corer, free fall grabs, and a bottom tripping Niskin Bottle to obtain bottom water samples. We crossed the crest of the Carlsberg Ridge, and were about to lay Dan Buoys and commence a detailed sampling operation on June 1st in Discoveryarea 4A, when we had to break off operations and steam to the Seychelles in order to put off a sick crewmember.

On passage to the Seychelles, we encountered a Russian ship which had a doctor on board. The doctor came over and examined our sick crewmember, after which we continued to make for the Seychelles with all speed. Tragically, the crewmember, Mr. Teal, died before we could get him to port, and he was buried in the Seychelles.

We were delayed in the Seychelles until June 9th owing to mechanical problems, which necessitated a complete rearrangement of what was left of the

cruise. It was not worthwhile to steam back to the crest of the Carlsberg Ridge to continue our work there, because passage time would have used up a disproportionate amount of the time left available to us. Accordingly, the senior scientist, in consultation with other members of the scientific party, errected an alternative cruise plan to sample a seamount range to the north of the Seychelles. This was successfully accomplished, but with some further delays due to mechanical problems, and the cruise terminated on June 21st in Port Victoria.

Because of the difficulties encountered, none of the prime objectives of the cruise were met. Nevertheless, good material was obtained from interesting areas which should help to clarify sedimentary geochemical and metallogenic processes in the northwestern Indian Ocean.

d) Equipment

Sampling equipment used on the cruise included a gravity corer, dredge, Reineck Box Corer, Preussag free-fall grabs, free-fall corer, pipe dredge, and a bottom tripping Niskin water bottle. All functioned perfectly, and obtained samples in most cases.

Geophysical equipment used included a Magnetometer and an air gun. The former worked well, but the latter failed to produce useful results and because of time constraints its use was discontinued.

The satellite navigation system worked well during most of the cruise, probably because an air conditioning unit was installed in Bombay to cool it. However, it sometimes gave obviously erratic results.

The main equipment problems encountered during the cruise were with the ship's own equipment. Of these, the most serious from the scientific point of view was with the winch system, which necessitated using the winch at half speed for much of the time. This considerably delayed sampling operations. The bow thrust was also out of action for part of the cruise, which made station keeping difficult.

e) Recommendations

Two points became apparent during the course of SH 5/75, which if acted upon, would lead to a more efficient operation in the future.

a) The presence of a doctor on board in remote areas would reduce the liklihood of having to put into port because of crew illness. Had a doctor been on board SH 5/75, Mr. Teal's complaint would have been recognised as soon as we left Bombay, and he could have been put ashore with minimum disruption of the cruise schedule.

b) The permanent equipment on board Shackleton needs a more frequent overhaul. Problems with the refrigerators and winch led to considerable delay.

f) Acknowledgements

In spite of the difficulties encountered on SH 5/75, the Master and crew gave us support of the highest level. For this I am most grateful.

D.S. Cronan
Senior Scientist

APPENDIX

List of Stations SH 5/75

(positions subject to small correction on basis of track charts to be received)

Date	Station Number SH	Position	Depth * (M)	Procedure	Recovery
30/5/75	1298	07°47.3N 63°35.05E	4960	Dredge	Brown Clay
30/5/75	1299	08°02.57N 63°52.55E	4622	Dredge	Nothing
30/5/75	1300	08°00.34N 63°56.32E	4615	Gravity Corer	44 cm of brown mud
31/5/75	1301(a)	06°52.34N 62°53.63E	3640	Dredge	3 types of Ferromanganese oxide
	1301(b)			Grabs	Nothing
31/5/75	1302	06°55.36N 62°49.27E	4066	Water Bottles	Full
1/6/75	1303(a)	05°0.63N 61°32.95E	3000	Dredge	Two pieces of ferromanganese oxide
	1303(b)			Grabs	Nothing
10/6/75	1304(a)	02°41.32S 56°43.63E	4267	Dredge	One jellyfish
	1304(b)			Grabs	Nothing
	1304(c)			FF Corer	Nothing
10/6/75	1305	02°41.14S 56°43.19E	4369	Gravity Corer	256 cm of buff calcareous ooze
10/6/75	1306(a)	02°33.49S 57°19.43E (estimated)	3983	Pipe Dredge	Nothing
11/6/75	1306(b)			Gravity Corer	190 cm of pale buff calcareous ooze
11/6/75	1307	02°33.27S 57°16.67E	3398	Dredge	Several crusts and rocks
11/6/75	1308	2°33.23S 57°19.04E	3231	Box corer & Water Bottle	Box corer full with calcareous ooze, Water bottle full.
11/6/75	1309	1°47.91S 57°24.41E	4470	Dredge	Small amount of calcareous ooze
12/6/75	1310	01°50.32S 57°25.22E	4425	Dredge	Nothing
12/6/75	1311	01°22.85S 57°13.30E	3514	Dredge	Nothing
12/6/75	1312	01°21.09N 57°16.71E	4404	Dredge	Nothing

Date	Station Number SH	Position	Depth * (M)	Procedure	Recovery
13/6/75	1313	01°21.09S 57°16.71E	4404	Gravity core & Water bottle	68 cm of buff calcareous ooze, water bottle full
13/6/75	1314	1°17.42S 56°02.95E	4250	Dredge	Nothing
14/6/75	1315(a)	00°10.65N 55°31.11E	1200	Dredge	Two Mn encrusted rocks, two pieces of coral and echinoid
	1315(b)			Grabs	Nothing
14/6/75	1316	0°05.35N 55°37.83E	3125	Dredge	Nothing
15/6/75	1317(a)	0°04.80N 55°34.21E	1637	Dredge	Prolific haul of Mn encrustations and rocks
	1317(b)	0°11.15N 55°35.31E	1600	Box corer	Pieces of crust
15/6/75	1318(a)	0°12.65N 55°35.56E	1637	Dredge	Mn encrusted limestone
	1318(b)	0°10.55N 55°36.26E	1358	Box corer	Full of calcareous ooze
16/6/75	1319(a)	01°11.35N 56°34.69E	975	Grabs	Coral
	1319(b)	01°11.24N 56°37.61E	1400	Dredge	Nothing
16/6/75	1320(a)	1°12.6N 56°36.9E	930	Dredge	Large haul of Mn encrusted limestone
17/6/75	1320(b)	1°12.85N 56°34.37E	885	Gravity corer & Water bottle	Corer empty, bottle full
16/6/75	1321(a)	1°19.23N 56°35.64E	2180	Dredge	Large haul of Mn encrusted rocks
17/6/75	1321(b)	1°17.64N 56°35.86E	1985	Gravity corer & water bottle	No core, bottle full
16/6/75	1322	01°17.04N 56°34.48E	1865	Gravity corer & water bottle	Rock in corer, bottle empty
17/6/75	1323(a)	1°21.56N 56°36.27E	2800	Dredge	Large haul of rocks
	1323(b)			Gravity corer & water bottle	92 cm of buff calcareous ooze, water bottle empty
	1323(c)	1°21.89N 56°36.66E	2940	Ditto Repeat	57 cm of buff calcareous ooze and 1 Mn nodule, bottle full
18/6/75	1324(a)	1°24.76N 56°36.9E	4000	Dredge	Rocks
	1324(b)	1°24.87N 56°36.98E	4122	Gravity corer & water bottle	No core, bottle full
19/6/75	1325(a)	0°8.70N 55°09.9E	1800	Dredge	Rocks and encrustations
	1325(b)	0°08.56N 55°09.16E	1408	Gravity corer & water bottle	No core, water bottle full

Date	Station Number SH	Position	Depth * (M)	Procedure	Recovery
19/6/75	1326	01°13.45S 56°01.54E	4480	Dredge	Nothing
20/6/75	1327	03°17.78S 55°07.68E	2860	Dredge	Nothing

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