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TR-138

UNIVERSITY OF RHODE ISLAND
Graduate School of Oceanography

KINGSTON, R. I.
Narragansett Bay Campus

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CRUISE REPORT
TR-138 (MAR: 46°N to 52°N)
21 June - 13 July 1973
R/V TRIDENT

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SCHEDULE

A 23-day cruise was undertaken from Narragansett, R.I. to Reykjavik, Iceland. On transit rock dredge sampling was carried out on the Mid-Atlantic Ridge from 46°N to 52°N. Each dredge site was accompanied by magnetic and seismic reconnaissance profiling.

SCIENTIFIC PARTY

David G. Johnson	URI	Chief Scientist (Schilling sponsored)	USA
William M. White	URI	Geologist	USA
Mark Zajac	URI	Geologist	USA
Susan Anderson	WHOI	Marine Affairs	USA
Nicole Cruft	Univ. N.M.	Biologist	U.K.
Jeremy Boak	Harvard	Geologist	USA
David L. Mayerson	Wesleyan	Geologist	USA
Peter S. Meyer	Dartmouth	Geologist	USA
Allan Walter	Wesleyan	Geologist	USA
Michael Bergeron	URI	Geochemist	USA
Philip H. Hendershot	URI	Marine Technician	USA
Mark Weishan	URI	Marine Technician	USA

SHIP'S COMPANY

Terry Hansen, Master	John Symonds, Chief Engineer
Richard A. Flint, Chief Mate	Theodore Surrrette, First Engineer
Jeffrey L. Seeley, Second Mate	Frank Richard, Second Engineer
John Stohlberg, Jr., Bos'n	Paul Sullivan, Radio Officer
Omer Palardy, AB Seaman	Manuel Faria, Steward
Frederick Russell, AB Seaman	Kenneth Erban, Second Cook
Richard Demers, AB Seaman	James Merritt, Oiler
Ian Chase, Ordinary Seaman	Jean Cormier, Oiler
David Fisk, Ordinary Seaman	William Coswill, Oiler

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OPERATIONS

The objective was to study geochemical variations of basalt erupted along the Mid-Atlantic Ridge between 46°N and the Gibbs Fracture Zone at 52°30'N. Ten days were used in transit from Narragansett to the operations area on the Mid-Atlantic Ridge. Half of one day was lost during this transit as a result of a forced southerly route in order to avoid extensive iceberg fields reported as far south as 42°N, SSE of Newfoundland. Of the nine primary target dredge sites, eight were successfully dredged. One additional dredge site (sta. 1AD) was placed between station 1D and 2D, in the southern sector of the operations area. An additional station (sta. 11D) was dredged close to the junction of the Gibbs Fracture Zone and the Mid-Atlantic Ridge. Dredge operations on survey lines 4 and 10 were forfeited because of rough seas.

Time allocation:

Seismic, magnetic, bathymetric profiling (14 profiles: 12 perpendicular to and 2 parallel to the ridge axis)	374 nm	53 hrs.
Dredging (10 stations)	-	64 hrs.
Transit, including magnetic and bathymetry	3275 nm	397 hrs.
Total	<u>3649 nm</u>	<u>21.4 days</u>

PRELIMINARY RESULTS

Johnson and Vogt (The Mid-Atlantic Ridge from 47° to 51°N, GSA Bull., in press) have found that the topography of the Mid-Atlantic Ridge between 47°N and 51°N consists of alternating north-south (normal) axial segments connected by oblique axial segments. The north-south ridge sections have generated bands of relatively high relief and high average elevation. This is in contrast to the oblique axial segments which tend to have more subdued relief and a lower overall elevation. Dredge stations 2D, 3D, and 5D were obtained on normal axial segments and station 7D was obtained on an oblique ridge segment. Station 6D was dredged near a boundary between normal and oblique segments. Dredge station 11D at 52°N lies north of the Johnson and Vogt study area and is curious in that the survey line, run perpendicular to the ridge axis, revealed a normal, high relief western flank, and a low relief, subdued eastern flank.

ACKNOWLEDGMENTS

Large scale maps with detailed bathymetric and magnetic data, earthquake epicenter locations, and a preprint were kindly provided by G. L. Johnson and P. R. Vogt of the U.S. Naval Oceanographic Office. The assistance of Captain Hansen and his crew as well as participating students is acknowledged.

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TR-138 DREDGING STATIONS

Station	Latitude & Longitude	Date	Depth Range	Operator	#Gunny Sacks	Results
1D	46°12.7'N 27°31.4'W	7/1	2725-3000	Johnson	0	1st attempt, MAR, central rift (?) no recovery
1AD	46°13.9'N 27°23.4'W	7/3	2045-2090	Johnson	11	2nd attempt, MAR, E. side of rift valley- 350kg. semi-fresh, massive, vesicular pillows and neck basalts. Traces of palagonite and manganese.
2D	47°03.5'N 27°21.3'W	7/2	2400-2550	Zajac	1	MAR, W. side central rift - fist size massive olivine basalt, sediment balls, ice rafted fragments, few manganese crust fragments, (10 kg total)
3D	47°03.1'N 27°21.0'W	7/2	2850	Johnson	0	1st attempt, MAR, center of rift valley
	47°03.1'N 27°21.0'W	7/2	2950-3000	White	2	2nd attempt, MAR, center of rift valley- semi-fresh pillow and neck basalt, glass intact with traces of manganese (35 kg total)
	47°46.6'N 27°38.4'W	7/4	2680-2800	Johnson	2 canvas	MAR, west side of hill within rift valley- 3 pieces basalt: 1 small neck covered with thick palagonite and manganese crust, 1 piece with ropy, pahoehoe structure, 2 pieces clay stone (8 kg total)
4D	-	-	-	-	-	Surveyed but not dredged due to rough seas.

TR-138 DREDGING STATIONS (cont'd)

Station	Latitude & Longitude	Date 1973	Depth Range	Operator	#Gunny Sacks	Results
5D	49°30.9'N 78°01.8'W	7/5	2680-2770	Zajac	0	1st attempt, MAR, magnetic anomaly max., west side of rift valley - no recovery
	49°31.4'N 28°32.2'W	7/5	2545-2630	Zajac	1	2nd attempt, MAR, magnetic anomaly max., west side of rift valley - 48 small glass fragments, 8 ice-rafted, well rounded pebbles, 5 larger pieces of pillow fragments with vesicles and glass, (10 kg. total).
6D	50°02.6'N 28°56.0'W	7/6	3360-3380	Johnson	2 canvas	MAR, east side of central rift, at least 5n. miles south of survey line - Altered basalt fragment with glass, 14 glass fragments, 1 ice-rafted schist cobble, 3 schist pebbles, (3 kg total).
7D	50°27.5'N 29°25.4'W	7/6	3800-3960	White	7	MAR, central rift, using backhoe tooth dredge - fresh basalt consisting of 2 large pillows (75 kg each) and other smaller pillows, trace of palagonite, (265 kg total)
8D	51°16.6'N 30°00.9'W	7/8	3400-3600	White/ Zajac	1	MAR, west side central rift - 1 fresh pillow basalt, sandwiched with glass layers, possible multi-flow structure (15 kg total)
9D	51°33.3'N 29°55.4'W	7/7	3600-3820	Johnson/ Bergeron	5	MAR, central rift - fresh pillow basalt fragments, with thick glass: 1 large pillow (125 kg total).

TR-138 DREDGING STATIONS (cont'd)

Station	Latitude & Longitude	Date	Depth Range	Operator	#Gunny Sacks	Results
100					-	Surveyed but not dredged due to rough seas.
11D	52°01.3'N 29°51.8'W	7/9	3700-3800	Johnson/ Bergeron	0	1st attempt, MAR, central rift - no recovery
	52°00.4'N 29°57.0'W	7/9	3700-3900	White	1	2nd attempt, MAR, central rift - fresh pillow basalt and 1 fist size massive basalt fragment, (15 kg total).



