

August 10, 1963

Report of the AFRAM Expedition (Cruise 4) with R/V TRIDENT

R/V TRIDENT left Rhode Island on 22 March 1963 for Bermuda and West Africa. She returned on 6 June 1963.

LEG* LIST OF SCIENTIFIC PERSONNEL

- 1 Dr. John A. Knauss
- 1 Dr. Charles J. Fish - Zooplankton
- 1 Paul Perkins - Zooplankton
- 1 David Roebuck - Zooplankton
- 2 Dr. Robert McMaster - Geology
- 2-4 Dr. Dale C. Krause - Geology
- 1-2 Donald Corrigan - Geology
- 1-4 James Robb - Geology
- 1-4 Robert Howe - Geology
- 1-2,4 Kwadwo Ansong - Geology
- 2-4 Dr. Peter Wangersky - Chemistry - Biology
- 1-4 Donald Gordon - Chemistry - Biology
- 1-4 James Frey - Chemistry - Biology
- 2-4 Thomas D'Ambra - Chemistry - Biology
- 3 Dr. David Schink - Silicon 32
- 3 Maurice Anderson - Silicon 32
- 3 Clifford Schink - Silicon 32

LIST OF SHIP PERSONNEL

- Barnes Collinson - Master
- Robert Hempstead - Chief Mate
- John Hemmalin - 2nd Mate
- Victor Cousineau - Bos'n
- Henry Martin - Seaman
- Jose M. Llopis - Seaman
- LeRoy Palmer - Seaman
- Samuel Stokely - Seaman
- Harris Frausel, Jr. - Seaman
- Joseph Knight - Seaman
- G. A. Thompson - Cook
- Raymond Jackson - Chief Eng.
- John Symonds - 1st Ass't Eng.
- Robert Jackson - 2nd Ass't Eng.
- Robert Duffy - Electrician
- Paul Petersen - Electronics Tech.
- Harold Sindsen - Oiler-Deck Eng.
- Sheldon Stacy - Oiler
- Edmund Martinez - Oiler
- George Alves - Oiler

Refueling taking on stores and change of personnel took place at the following ports: St. George, Bermuda 28 - 31 March; Monrovia, Liberia, 24 - 27 April; Sierra Leone 14 - 16 May.

The first leg was devoted to testing of the Scripps-Narragansett Plankton Sampler of Fish near $30\frac{1}{2}^{\circ}\text{N}$, $66\frac{1}{2}^{\circ}\text{W}$ and bioacoustic studies of Perkins. A change in personnel at Bermuda changed the emphasis from animal biology to chemical biology, water chemistry and geology.

*Key to legs: 1. Rhode Island - Bermuda - March 22-23
McM-2. Bermuda - Monrovia - March 31/April 1-
3. Monrovia - Sierra Leone
Kraus 4. Sierra Leone - Rhode Island

TR-004

→ expanded

D. Corrigan took 7 gravity cores in a profile over the mid-Atlantic Ridge for paleomagnetic studies. Another core was taken on the last leg of the cruise to → in storage
complete one profile. A short reconnaissance survey of the rift in the center of the ridge disclosed that although the rift is discontinuous, the magnetic anomalies associated with the rift are continuous.

A section of 10 hydrographic stations was made between the Cape Verde Islands and Cape Verde itself at Dakar, Senegal. Immediately thereafter, R. McMaster began his program of studies on the Guinea Shelf. McMaster took a large number of sediment grab samples along traverses across the shelf. Cores and bottom photographs were also made. A "seismic profiler" traverse was made south of Dakar and showed folding of the shelf. McMaster left at Monrovia and was replaced by Schink's group. Ansong proceeded on to gather his data in Ghana.

The work of this third leg was centered around 8°N lat., 20°W long., which was chosen as the site for the collection of water for obtaining Silicon 32. A hydrographic section of ten stations was run out through this line from the shelf and an extensive echo sounding-magnetometer survey was run between Si³² stations.

Schink's group collected 100,000 gallons of surface waters from which the silicon was extracted for later analysis in Rhode Island. Mechanical difficulties prevented collection of very large water samples at various depths with a giant water sampler although the ship itself is well suited for this task.

Schink's group departed at Freetown and Ansong rejoined the ship. A very short dog-leg survey was made upon departing Freetown of the western boundary of the Freetown layered basic complex, the rock mass comprising the majestic Sierra Leone Peninsula.

The echo sounding-magnetometer survey of the Guinea Fracture Zone, initiated on the third leg, continued, firmly establishing its existence. Its trend is east-west and marked by the southern edge of the Guinea Shelf (roughly west of

Freetown 8-9°N). The fracture zone was carried west to where it seems to cross the mid-Atlantic Ridge near 15°N lat., 45°W. long.

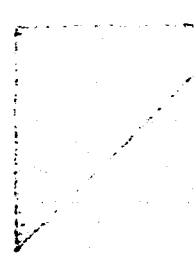
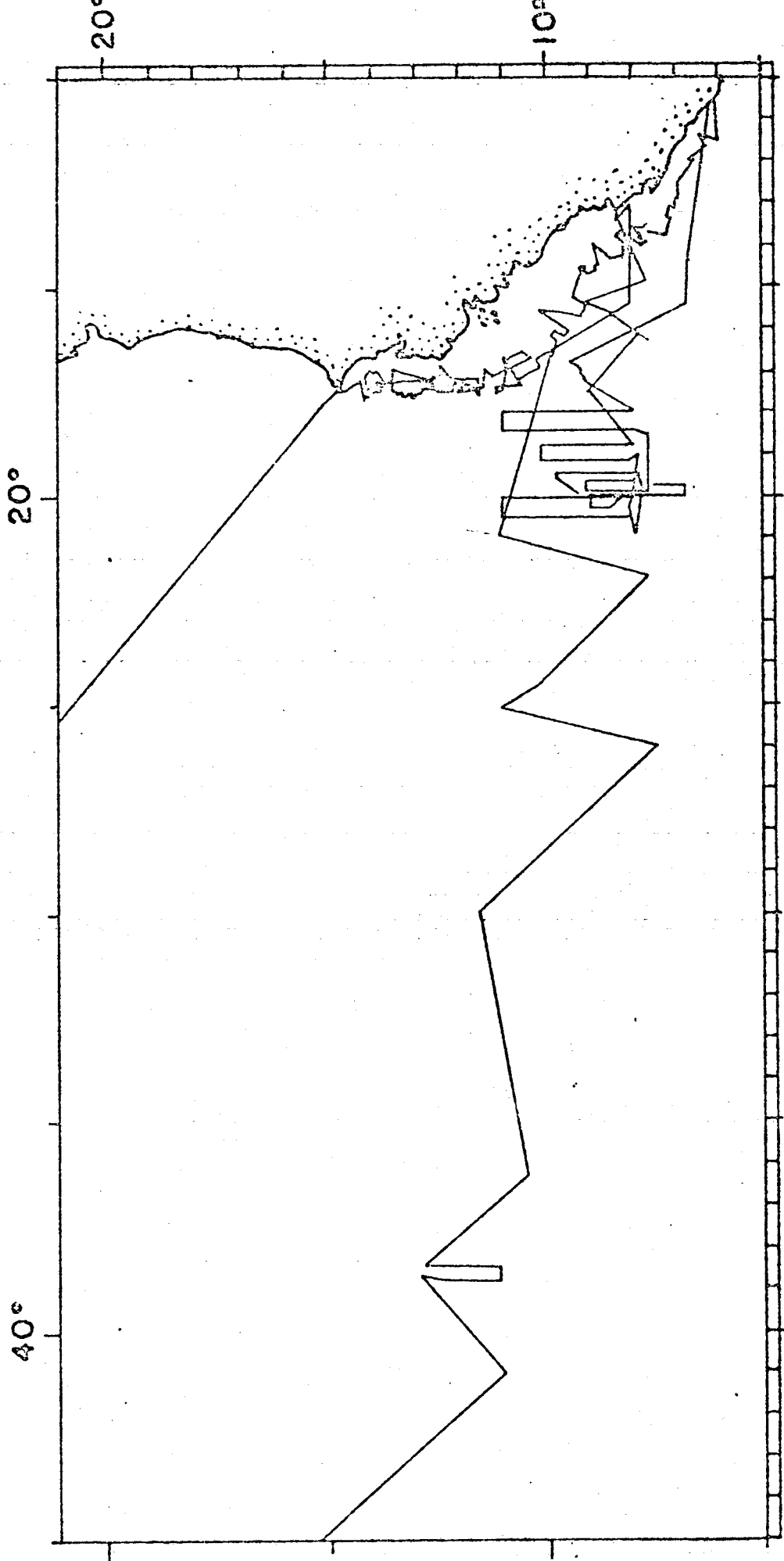
Echo sounding and magnetometer information was collected throughout the expedition.

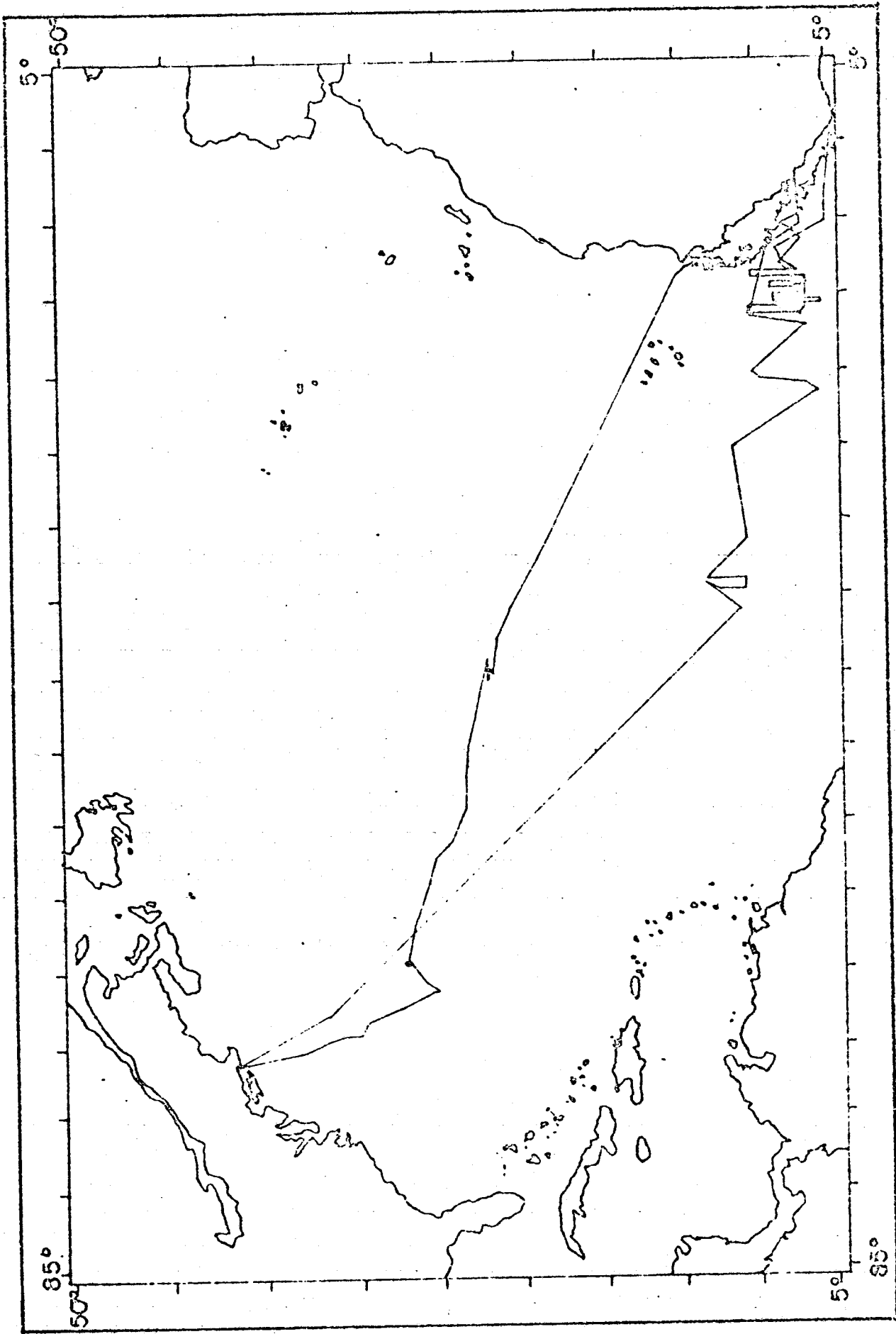
Dr. Peter Wangersky of the Bingham Oceanographic Laboratory of Yale University joined TRIDENT in Bermuda. He submitted the following account of his Program:

"On the "AFRAM" expedition of the University of Rhode Island research vessel, TRIDENT, 38 light and dark bottle productivity stations were taken. On each station initial, light, and dark bottle dissolved oxygen and dissolved carbohydrate were run. Samples were taken for particulate organic carbon analysis. These samples will be analyzed at the Bingham Oceanographic Laboratory of Yale University. Fifteen hydrographic stations were sampled for dissolved carbohydrate at a total of 59 levels. A series of fourteen deep stations were run, at depths of 5500 meters, using the Niskin 30-liter water samplers. Samples were taken for particulate carbonate, particulate organic carbon, and particulate manganese analyses at a total of 80 levels. These samples will also be analyzed at the Bingham Laboratory. In addition, 45 samples of surface water were taken to be analyzed for particulate organic materials.

"Conclusions drawn from the analyses already completed can be only tentative at best, since so much of the work must still be done. It appears from the hydrographic station data that the bulk of the dissolved carbohydrate can be found close to shore, in depths between 25-50 meters. The productivity stations suggest that this carbohydrate results from the breakdown of phytoplankton. In the area of the ocean covered by this cruise the intense sunlight makes the surface water unproductive. The bulk of the photosynthesis occurs at depth, probably between 20-100 meters. The only area of great surface productivity was a diatom bloom found off Cape Verde."

The TRIDENT returned to Rhode Island on 6 June 1963.





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