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Report of Trident Cruise TR-027

New England Continental Shelf

R/V Trident Cruise TR-027 began on 19 August, 1965 and ended on 2 September, 1965. Its purpose was to collect additional geologic data on that portion of the New England Continental Shelf on which studies were begun with Cruise TR-009 in 1963. Thus the area investigated was roughly from Hudson Canyon to Georges Bank.

The geological investigations of this cruise comprised the initial phase of a Ph.D. research program for Louis E. Garrison.

Scientific Personnel

- Dr. Robert L. McMaster
- Louis E. Garrison
- William P. Dillon
- Sheldon Pratt
- Ronald Smith
- John Piety

CRUISE OPERATIONS

The data collected falls into three main categories: (1) Continuous acoustic reflection profiles, (2) geomagnetic profiles, and (3) bottom samples. These data were not collected in that order, however, as location and sea conditions at any given time necessarily dictated the particular kind of measurements which were taken. Thus at least one or two kinds of data were being gathered continuously during the two-week period except when operations were halted by mechanical difficulties.

Continuous acoustic reflection profiling was accomplished with a Pneumatic Acoustic Repeater (PAR) leased from Bolt Associates of Norwalk, Connecticut. About 435 miles of sub-bottom profiles were made with this instrument. The quality of these records varied with sea conditions and the temperament of the equipment, and ranged from poor to excellent. Mechanical and electrical breakdowns caused a number of abortions, and on 23 August it became necessary to put into New London,

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Connecticut where a technician from Bolt Associates met the ship and overhauled the PAR equipment. Approximately 12 hours⁵⁵ were lost, but that particular difficulty was solved. Further repairs to this equipment were performed at sea by the ship's crew and scientific personnel, and maintenance was a troublesome problem throughout the cruise.

Geomagnetic profiles were made by means of the proton magnetometer, and over 950 miles of such data were recorded. This instrument operated perfectly as far as could be ascertained.

Bottom samples consisted of surface sediments obtained with the Smith-McIntyre sampler, large cores obtained with the box corer, and standard piston cores. Seventeen grab samples were taken to complete the surface sediment survey south of Long Island and two box cores and seventeen piston cores were taken at selected locations on the outer shelf.

Due to the awkward size and weight of the box corer, sea conditions prevented its being used as much as had been planned. *2. Schlegel*

The piston corer, a venerable piece of equipment, began to breakup during the cruise and three rather disparate welding jobs were necessary to keep it in operation. In addition, the Smith-McIntyre sampler was bent and had to be straightened by the engine room crew.

Three camera lowerings were attempted, but the underwater camera could not be made to function. The strobe light would not flash underwater, and it was later determined that this was due to a faulty external connection cable which was shorting out the system.

Ten sea-bed drifter stations were made. These sea-bed drifters, obtained from W.H.O.I., were planted around Nantucket Shoals in order to gain some information on the net bottom current movements in that area. Two of these drifters were recovered within 2 weeks.

RESULTS

Several of the very coarse shelf-edge deposits were sampled and it is hoped that from these we may learn more about the time and conditions of lower sea levels in this area.

The sub-bottom profiles appear to show some very significant shallow unconformities. These are believed to represent former erosion surfaces now covered by one to several hundred feet of sediment.

The magnetic data should tie the nearshore work around Rhode Island Sound with what is known of the geomagnetic gradient and anomalies near the shelf edge. In particular an effort was made to run profiles in an east-west direction since most such profiles are run normal to the shore line. In this way it is believed that we may pick up any possible north-south trending anomalies. The preliminary results of this work showed no such features, but a careful plotting of the data will be of value in the area.

ADDENDA

It seems that a scientific cruise report should make mention of the performance of the ships crew, since so much of the success of a cruise depends upon their cooperation with the scientists.

It is a pleasure here to acknowledge the very valuable assistance of Capt. Collinson and the entire ship's company on this cruise. Their cooperation was the very best.