

13. SITE 43

The Shipboard Scientific Party¹

SITE BACKGROUND

The premature termination of drilling at Holes 42.0 and 42.1, because of the impenetrable chert, left the Leg 5 personnel with approximately two days in excess of the running time required to reach port in Honolulu at the end of the leg. The decision was made to drill a short hole along the track to Honolulu, and to give priority to the first attempt to be made aboard *Glomar Challenger* to run casing on a hole. The use of a landing base and casing must become a routine operation before re-entry capability can be realized in deep sea drilling.

The sediment thickness map of the North Pacific (Ewing *et al.*, 1968) showed only one area along the route between Holes 42.0, 42.1 and Honolulu where sediment thicker than 0.1 second had been reported. This area lies southeast of the Hawaiian Islands, along the same trend, at approximately latitude 17°N, longitude 152°W. The presence of Eocene fossils in a piston core from the area (Ewing *et al.*, 1968) suggested that the site might be sufficiently fossiliferous to provide information on the biostratigraphy and sedimentation in this region prior to the development of the Hawaiian Ridge.

The approach to the site did not reveal the thicker sediment section expected. A general survey was then undertaken that showed the site area to be very near the outer slope of the Hawaiian Arch which surrounds the northwest-trending Ridge. The sediment cover on the abyssal hills away from the slope of the arch is very thin (less than 0.05 second). The survey was halted over a narrow depression lying about 100 meters below the crests of two groups of abyssal hills (Figure 1).

The on-site seismic profile (Figure 2) is difficult to interpret, and a site with a greater sediment thickness would have been preferred. Time limitation, however, dictated that the site should be located here.

Location

Site 43 is located at latitude 17° 06.59'N, longitude 151° 22.51'W in a depression between groups of abyssal hills.

OPERATIONS

The landing base and casing were lowered on the drill string to be set in the bottom. The ship was then moved 200 feet (65.6 meters), and coring operations were commenced. The first core attempt resulted only in water sampling. The remainder of the coring operations were confused by mechanical difficulties, due in a large part to the landing base not having detached from the drill string in the first hole. Possibly the casing broke off after Core 1 was taken; and, the depth for Core 2 may be 60 feet (18.3 meters) deeper than shown on Table 1. The entire coring operation, however, was carried out with the landing base still attached to the drill string, which meant that the hole formed was 6 feet or so in diameter. Upon retrieval of the drill string, it was discovered that the bit had been coring on a hard layer; but, the nature of the layer, or its actual depth below the sea floor, is unknown. Because of the operational difficulties, the cores from this site should be interpreted with caution from the viewpoint of any sequence.

LITHOLOGY

At Site 43, seven meters of sediment were recovered. Due to mechanical difficulties, discussed under Operations, the depths of recovery below the sea floor are uncertain. The sediment cores recovered are essentially undisturbed.

The cored interval is represented by a single uniform sediment type: a yellowish-brown silty mud. A thin (10-centimeter) sandy muddy silt layer occurs near the top of Core 2.

The silt component of the sediment is composed of fresh and weathered angular feldspar grains, zeolites, hematite (?) grains, rare glass shards and occasional ferromagnesian grains. Sand in the sandy layer is

¹D. A. McManus, University of Washington, Seattle, Washington; R. E. Burns, ESSA—University of Washington, Seattle, Washington; C. von der Borch, Scripps Institution of Oceanography, La Jolla, California; R. Goll, Lamont-Doherty Geological Observatory of Columbia University, Palisades, New York; E. D. Milow, Scripps Institution of Oceanography, La Jolla, California; R. K. Olsson, Rutgers University, New Brunswick, New Jersey; T. Vallier, Indiana State University, Terre Haute, Indiana; O. Weser, Chevron Oil Field Research Company, La Habra, California.

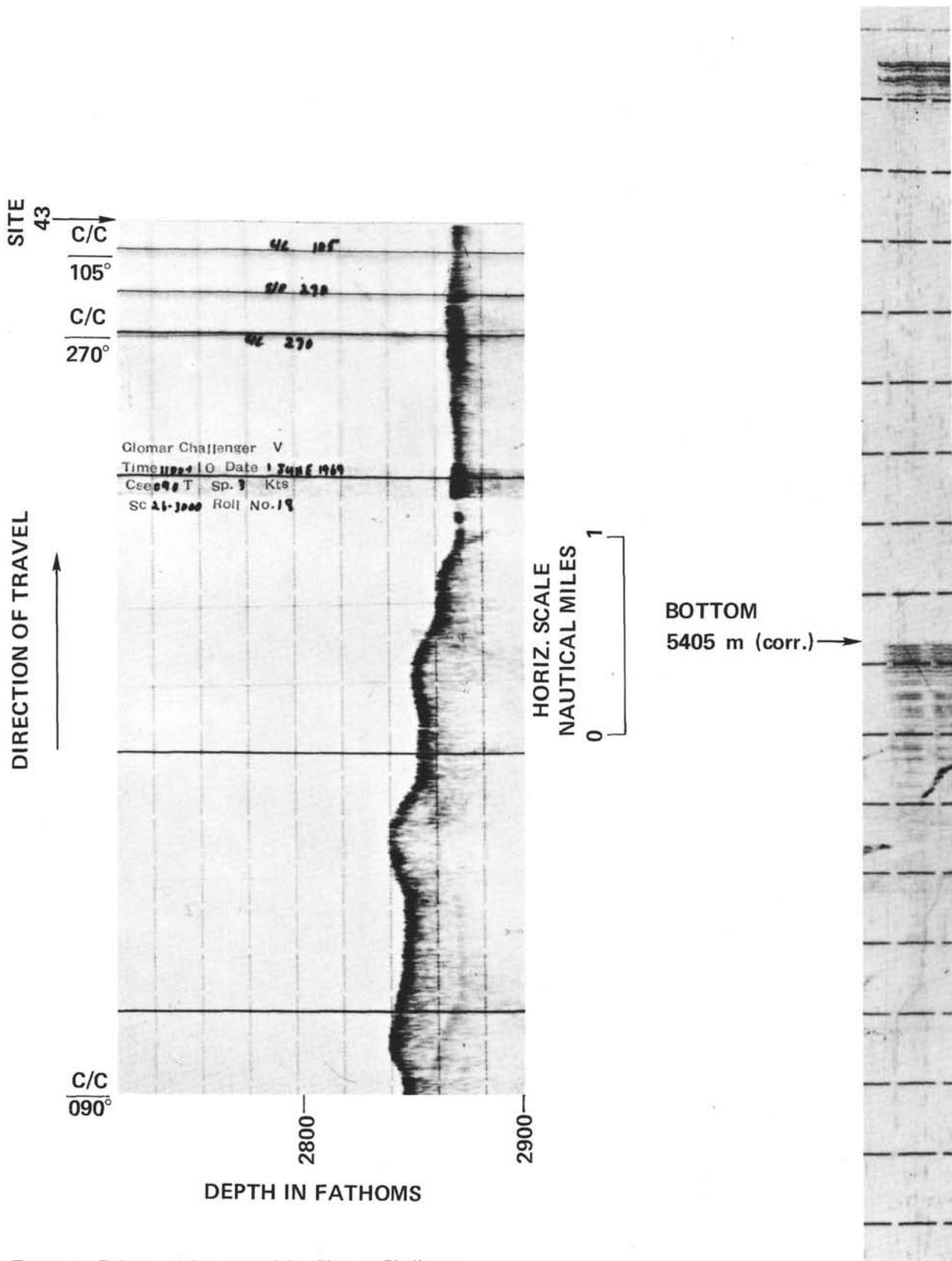


Figure 1. Echo sounding record by Glomar Challenger across Site 43.

TABLE 1
Drilling Summary of Leg 5, Site 43

Date	Core	Depth Below ^a Sea Floor (m)	Depth Below ^a Rig Floor (ft)	Core Cut		Core Recovered		Per Cent Recovered
				(ft)	(m)	(ft)	(m)	
2 June	1	0-2	17,735-17,740	5	1.5	5	1.5	100
	2	2-9	17,740-17,763	23	7.0	23	7.0	100
			Totals		28	8.5	28	8.5

^a After termination of drilling, a re-evaluation of core depths to take into consideration the effect of mechanical difficulties generates some doubt concerning the actual depths of the cores. The cores could represent part of a section as much as 80 feet thick with Core 2 having been taken near the base of the section.

composed of feldspar and opaque minerals. Rare fragmented siliceous microfossils are also present. The clay-size component is possibly montmorillonite.

PALEONTOLOGY

Nannoplankton

Nannofossils are not present in any of the sediment recovered from this hole and examined.

Foraminifera

Foraminifera are not present in any of the sediment recovered from this hole and sampled.

Radiolaria

The cores from Site 43 were not examined for Radiolaria.

SUMMARY

The sediment recovered from Site 43 is a silty mud. A thin bed of sandy silt occurs in Core 2.

The composition of the sediment suggests derivation from a volcanic source. The sand is composed primarily of feldspar and opaque minerals. The fine fraction of the sediment contains feldspar, zeolites, possible hematite, rare glass shards, some ferromagnesian grains and clay.

The source area for the sand in this sediment is not definable at the present time. Although turbidity currents from the Hawaiian Ridge might be a possible transporting mechanism, the site lies seaward of the arch around the Ridge. The arch would appear to be a barrier to the delivery of sediment to Site 43 by turbidity currents.

REFERENCE

Ewing, J., Ewing, M., Aitken, T. and Ludwig, W. J., 1968. North Pacific sediment layers measured by seismic profiling. In *The Crust and Upper Mantle of the Pacific Area*. L. Knopoff, C. L. Drake and P. J. Hart (Eds.). Am. Geophysical Union, Monograph 12, 147.

THE CORES RECOVERED FROM SITE 43

The following pages present a graphic summary of the results of drilling and coring at Site 43. Fig. 3, a summary of Site 43 is at the back of the book. Figures 4 to 5 are summaries of the individual cores recovered. A key to the lithologic symbols is given in the Introduction (Chapter 1).

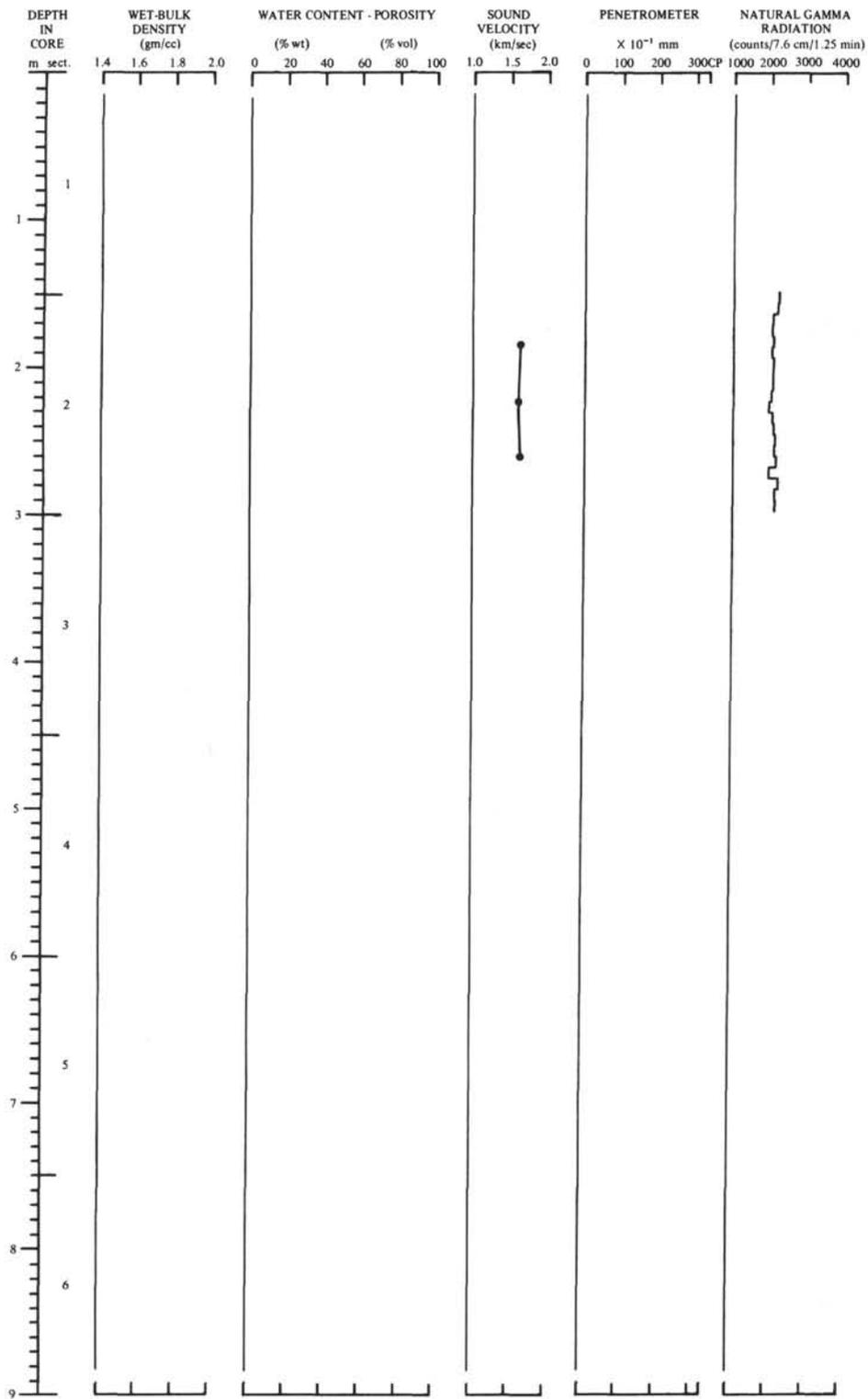


Figure 4A. Physical Properties of Core 1, Hole 43

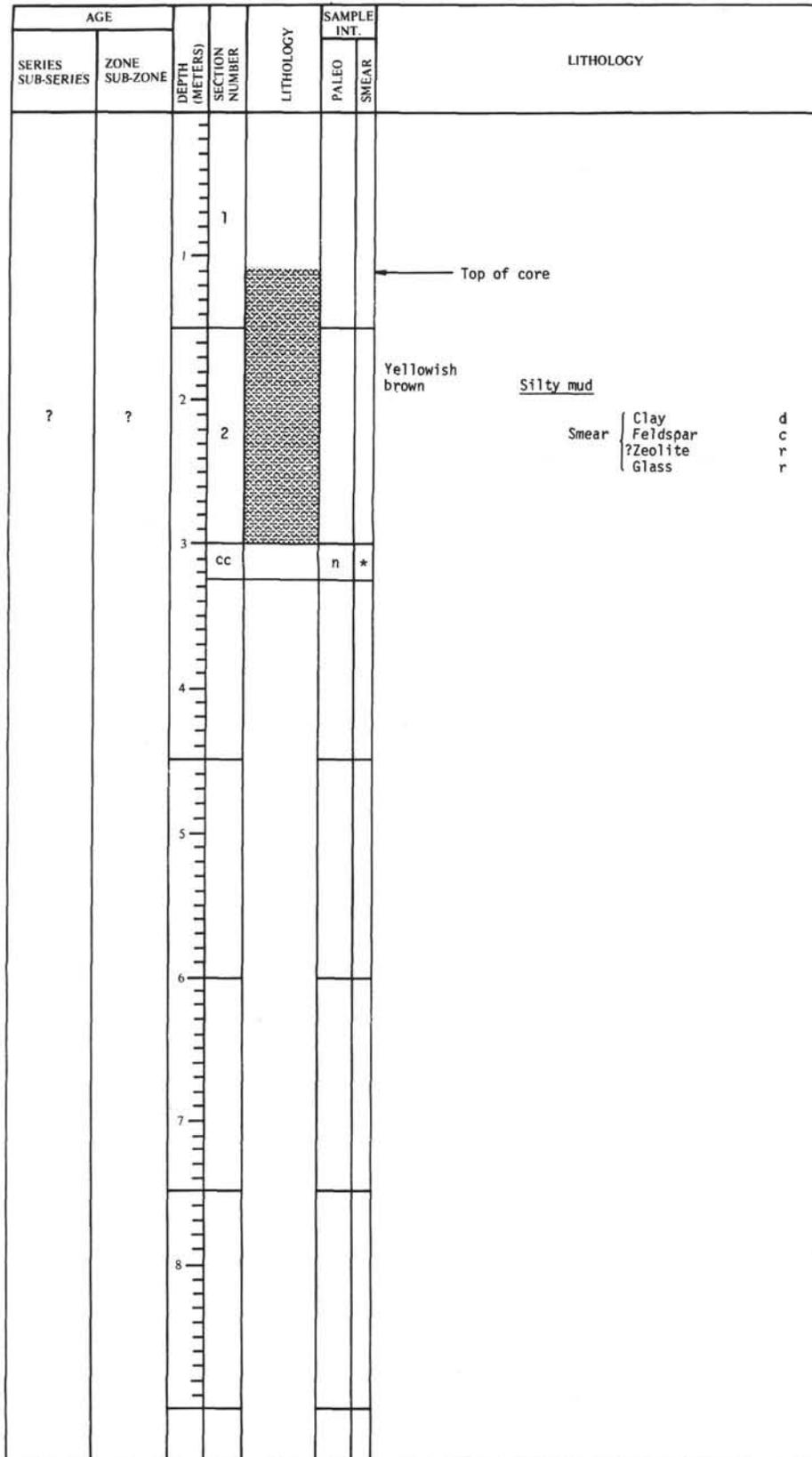


Figure 4B. Core 1, Hole 43 (0-2 m Below Seabed)

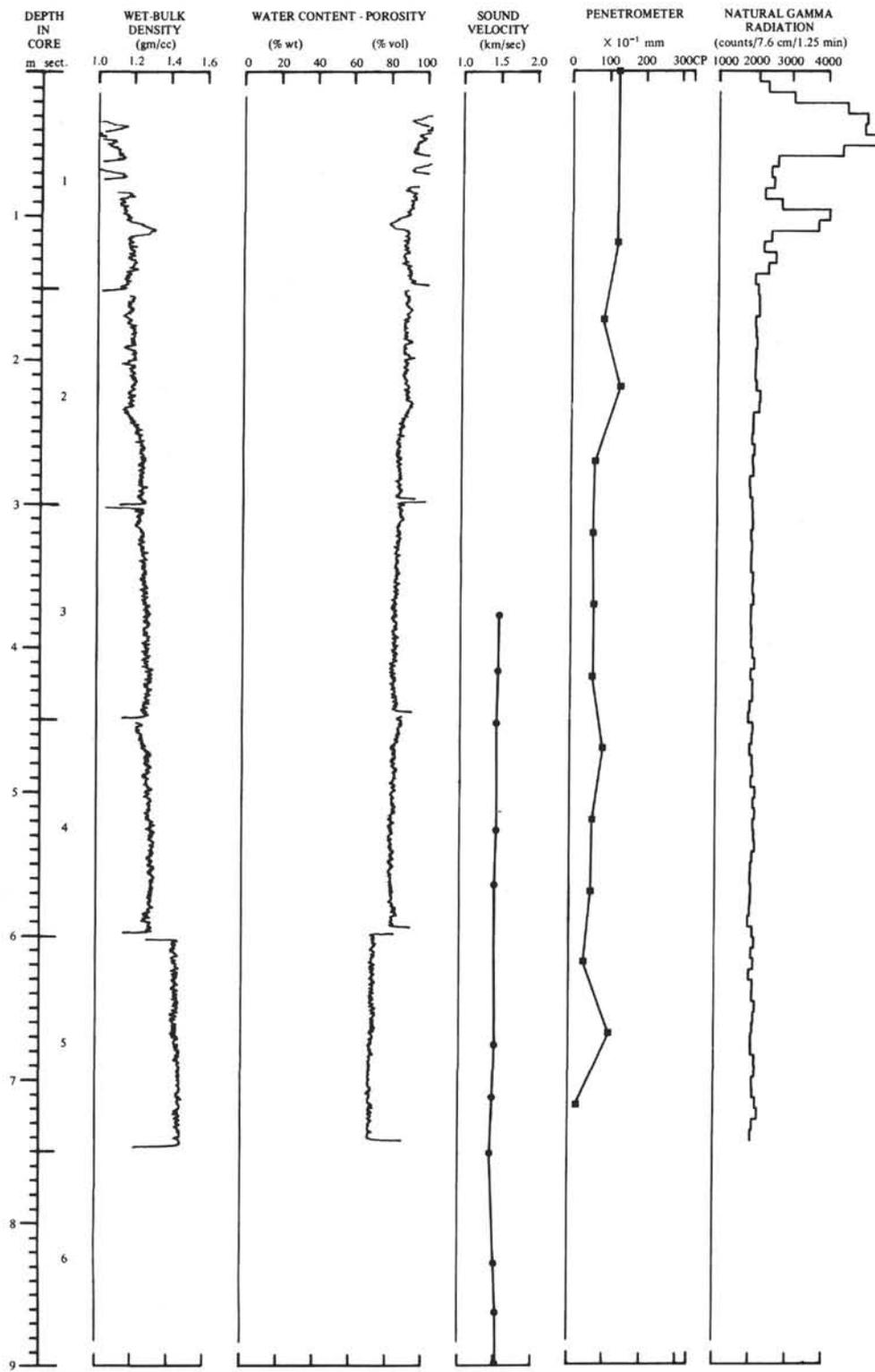


Figure 5A. Physical Properties of Core 2, Hole 43

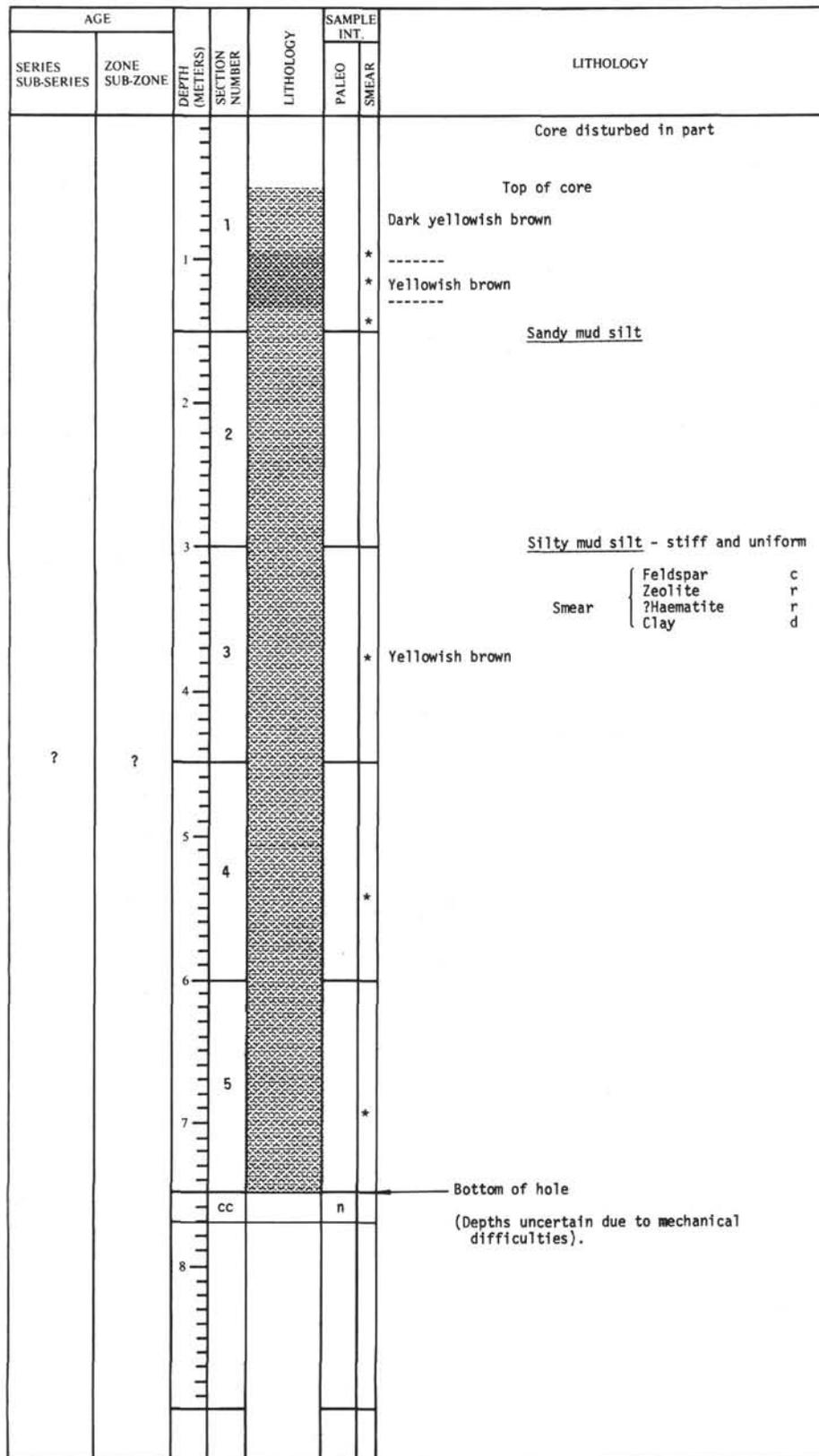


Figure 5B. Core 2, Hole 43 (2-9 m Below Seabed)

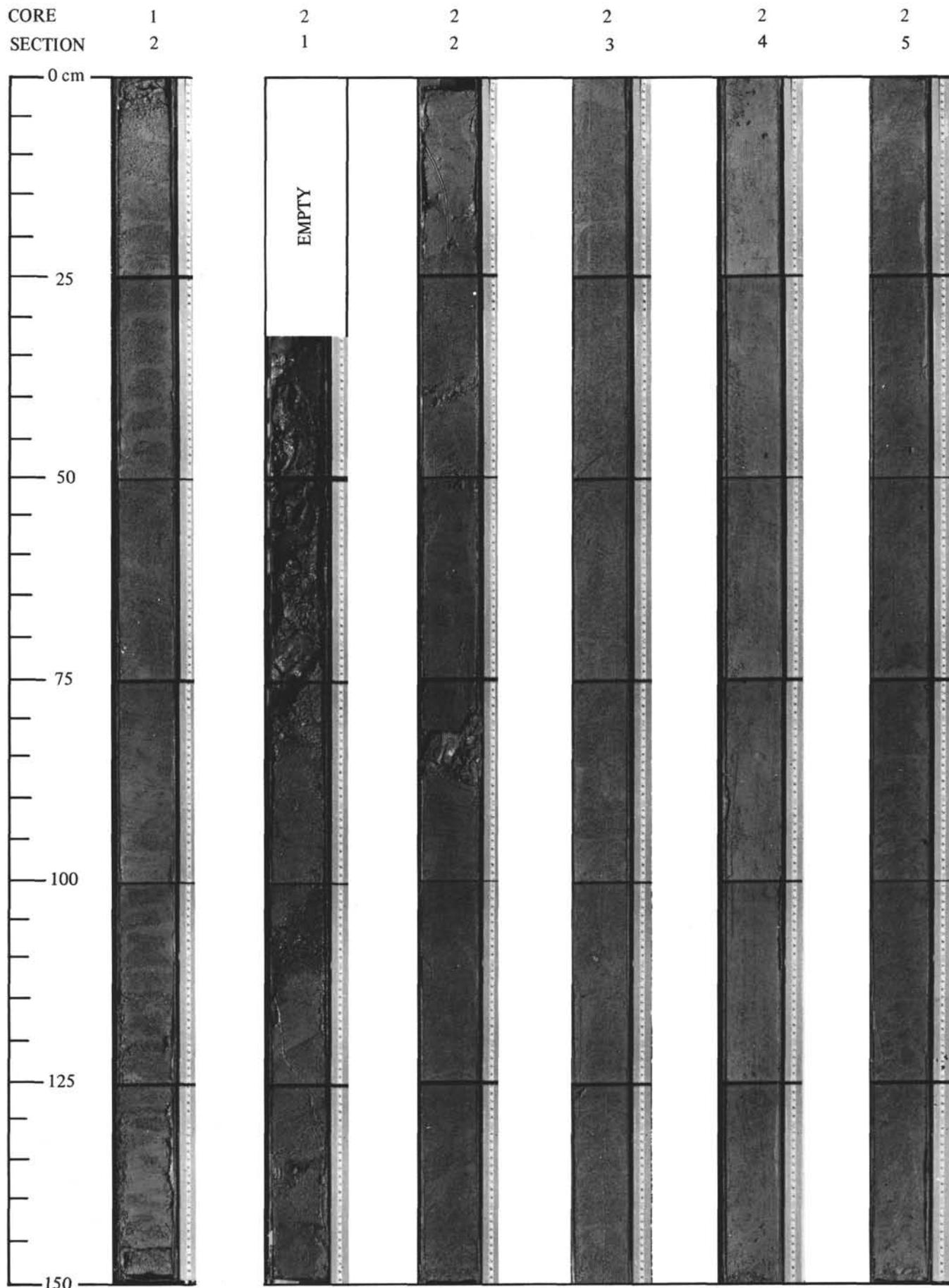


Plate 1. Cores from Hole 43