8. SITES 629 AND 630: LITTLE BAHAMA BANK[1]

Shipboard Scientific Party[2]

HOLE 629A

Date occupied: 19 February 1985, 2030 EST

Date departed: 20 February 1985, 0600 EST

Time on hole: 9.5 hr

Position: 27°24.39′N, 78°22.10′W

Water depth (sea level; corrected m, echo-sounding): 553

Water depth (rig floor; corrected m, echo-sounding): 563

Bottom felt (m, drill pipe): 563

Total depth (m): 579.5

Penetration (m): 16.5

Number of cores: 3

Total length of cored section (m): 16.5

Total core recovered (m): 6.2

Core recovery (%): 37.6

Oldest sediment cored:
Depth sub-bottom (m): 16.5
Nature: sandy carbonate ooze, lime sand, and rubble
Age: late Pleistocene (NN21)
Measured velocity (km/s): approximately 1.5

HOLE 630A

Date occupied: 20 February 1985, 1020 EST

Date departed: 21 February 1985, 1020 EST

Time on hole: 1 day

Position: 27°26.94′N, 78°20.43′W

Water depth (sea level; corrected m, echo-sounding): 807

Water depth (rig floor; corrected m, echo-sounding): 817

Bottom felt (m, drill pipe): 815

Total depth (m): 1065.3

Penetration (m): 250.3

Number of cores: 26

Total length of cored section (m): 250.3

Total core recovered (m): 220.3

Core recovery (%): 88

Oldest sediment cored:
Depth sub-bottom (m): 250.3
Nature: periplatform ooze and chalk with turbidites
Age: late Miocene (N16/17)
Measured velocity (km/s): 1.75, multichannel seismic-reflection profile LBB-18; 1.7, Hamilton Frame on individual samples; 1.8, split cores in liner

HOLE 630B

Date occupied: 21 February 1985, 1020 EST

Date departed: 21 February 1985, 1900 EST

Time on hole: 8.67 hr

Position: 27°26.94′N, 78°20.43′W

Water depth (sea level; corrected m, echo-sounding): 807

Water depth (rig floor; corrected m, echo-sounding): 817

Bottom felt (m, drill pipe): 815

Total depth (m): 895.4

Penetration (m): 80.4

Number of cores: 9

Total length of cored section (m): 80.4

Total core recovered (m): 79.6

Core recovery (%): 99

Oldest sediment cored:
Depth sub-bottom (m): 80.4
Nature: periplatform carbonate ooze
Age: latest Miocene–early Pliocene, NN12/13, N18/19 (extrapolated from Hole 630A)
Measured velocity (km/s): 1.75, multichannel seismic-reflection profile LBB-18; 1.7, Hamilton Frame on individual samples and on split cores in liner

[1] Austin, J. A., Jr., Schlager, W., Palmer, A. A., et al., 1986. *Proc., Init. Repts. (Pt. A), ODP*, 101.

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HOLE 630C

Date occupied: 21 February 1985, 1900 EST

Date departed: 21 February 1985, 2300 EST

Time on hole: 4 hr

Position: 27°26.94'N, 78°20.43'W

Water depth (sea level; corrected m, echo-sounding): 807

Water depth (rig floor; corrected m, echo-sounding): 817

Bottom felt (m, drill pipe): 815

Total depth (m): 824.3

Penetration (m): 9.3

Number of cores: 1

Total length of cored section (m): 9.3

Total core recovered (m): 9.3

Core recovery (%): 100

Oldest sediment cored:
Depth sub-bottom (m): 9.3
Nature: periplatform ooze with bank-derived aragonite
Age: Pleistocene
Measured velocity (km/s): 1.65, multichannel seismic-reflection profile; 1.7, Hamilton Frame on individual samples and on split cores in liner

Principal results: Site 629 on the upper part of the northern slope of Little Bahama Bank was occupied from 19 to 20 February 1985. Hole 629A, drilled at 27°24.39'N, 78°22.10'W, in 553 m water depth, represents an attempt to spud in at a modified BAH-7A. Approximately 16.5 m of sediment was penetrated with the hydraulic-piston-core/extended-core-barrel (HPC/XCB) technique before hard layers halted further drilling. The material recovered consists of sandy carbonate ooze, lime sand and rubble, and fragments of friable limestone, all of late Quaternary age.

Site 630 was occupied on 20 and 21 February 1985. Three holes were drilled, all of which are located at 27°26.94'N, 78°20.43'W, in 807 m water depth. Hole 630A penetrated 250 m of sediment with HPC/XCB techniques, recovery being 88%. Hole 630B duplicated the top 80.4 m, using the HPC system; recovery was 99%. Hole 630C took a third core of the mud line (9.3 m, 100% recovery).

Site 630 represents the upper end of the slope transect off Little Bahama Bank. It is at the crest of an interfluve where mud accumulates, yet sand and rubble from the platform bypass this zone in turbidity currents that are confined to adjacent gullies.

The stratigraphic section at Site 630 consists of the following: (1) 0–146 m sub-bottom; periplatform carbonate ooze (with abundant bank-derived aragonite), late Miocene to Holocene; and (2) 146–250 m sub-bottom; periplatform ooze and chalk with turbidites, late Miocene.

The record suggests that bypassing of sandy turbidity currents persisted for the last 6 m.y., and ooze accumulated at a rate of 27–62 m/m.y. Before 6 Ma, the site formed part of the turbidite apron at the foot of the gullied slope. Site 630 provides an excellent record of the export of fine sediment by the carbonate platform during the last 10 m.y.

To facilitate high-resolution stratigraphy at this location, drilling at Hole 630B duplicated the Pliocene–Pleistocene section to just below the site of the 3.5-Ma event, the presumed onset of Northern Hemisphere glaciation.

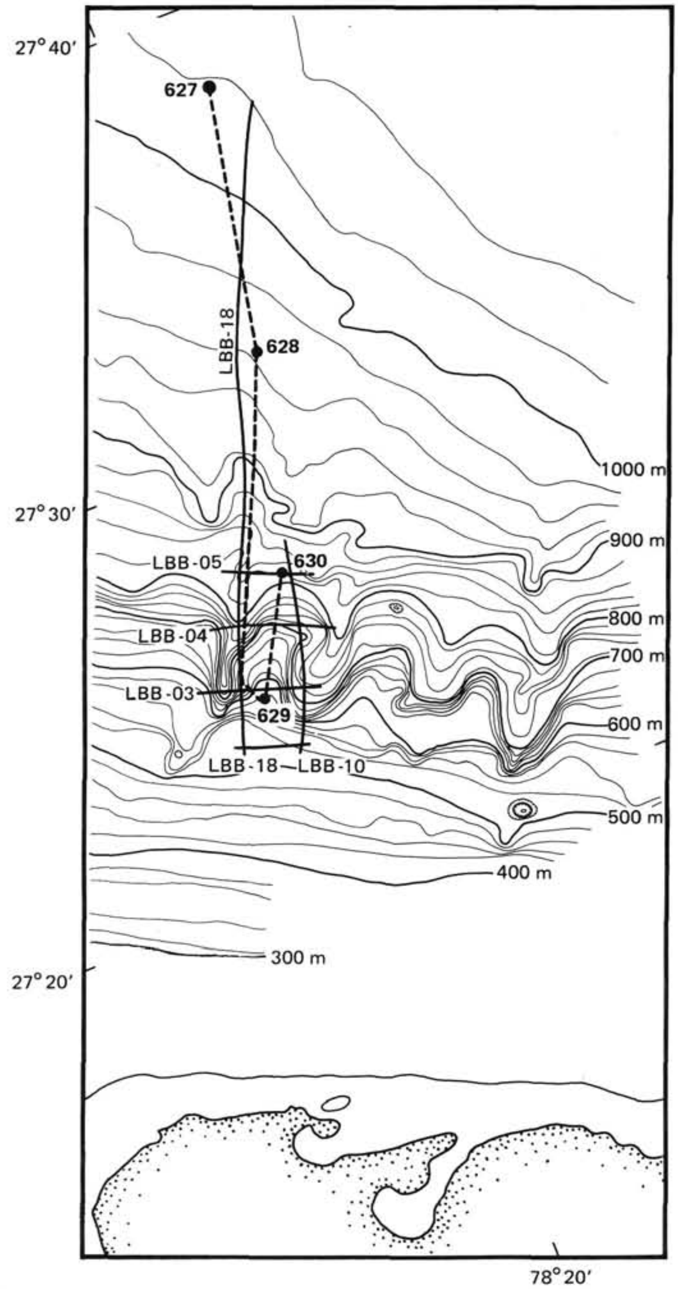

Figure 1. Leg 101 ship track (dashed line), upper slope, northern Little Bahama Bank.

OPERATIONS SUMMARY

The *JOIDES Resolution* left Site 628 for BAH-7-A, approximately 8 n. mi away, at 1630 hr, 19 February 1985 (Fig. 1, Site 627 chapter, this volume). The ship followed a course of 204° along the trend of site-survey line LBB-18. The speed was less than 4 kt, as the ship's dynamic-positioning thrusters were extended. En route, the decision was made to drill in deeper water than the intersection of LBB-1 and LBB-18, so Site 629 was situated on LBB-03 between LBB-10 and LBB-18 (Fig. 1).

At the crossing of LBB-18 and LBB-03, the ship changed course along LBB-03 until the 3.5/12-kHz systems indicated that the ship was at the crest of an interfluve between gullies, suggested by the compiled bathymetry (Van Buren and Mullins, 1983, modified by the site-survey results; Fig. 1). At 2030 hr, a beacon was lowered on a taut wire, and dynamic positioning began. SATNAV readings, however, suggested that the ship was approximately 150 m west-southwest of the top of the interfluve, so the taut wire was retrieved, an additional positioning maneuver was performed, and the taut wire and beacon redeployed. Site 629 occupies a position of 27°24.335–437'N, 78°22.059–131'W (Fig. 1). Water depth at this location was 545 m (uncorr.), 553 m (corr.).

A first attempt at a mud-line HPC core was unsuccessful at 2300 hr because of a crushed liner and an incomplete piston stroke, but a second attempt was successful just after 2400 hr, 19 February. The second HPC core also delivered an incomplete stroke, suggesting the presence of coarse-grained bottom sediments, so we decided to switch immediately to XCB techniques in an attempt to spud in. However, the XCB recovered only fragments of friable limestone along with lime sand and rubble, convincing everyone that further operations at this location were impossible.

Permission was received to move several nautical miles downslope along the same topographic high to the intersection of lines LBB-05 and LBB-10 (Fig. 1). The *Resolution* left Site 629 for Site 630 at 0600 hr, 20 February, at approximately 1 kt with thrusters extended, leaving 350 m of drill pipe in the water. The taut wire and beacon were pulled only 20 m above the mud line. Radar bearings from islands on Little Bahama Bank were used along with LORAN C to keep the ship on course during this short transit. The taut wire was lowered again at 0800 hr, but a move approximately 0.3 n. mi to the northeast was necessary 1.5 hr later. Dynamic positioning began at Site 630 at 1020 hr, 20 February. The final Site 630 position was as follows: 27°26.902–977′N, 78°20.382–486′W. Water depth was 797 m (uncorr.) and 807 m (corr.).

The mud-line HPC for Hole 630A was recovered at 1320 hr on 20 February. Over the next 11 hr, 18 HPC cores were recovered to a sub-bottom depth of 172.1 m, recovery being 98.9%. These HPC cores were followed by eight XCB cores to a total sub-bottom depth of 250.3 m. Recovery with the XCB was 64.1%, for a total recovery of 88% in Hole 630A. The decision had been made to double-HPC the upper part of the section at this site, and a mud-line core for Hole 630B was successful at 1150 hr, 21 February. Nine HPC cores were recovered in Hole 630B to a sub-bottom depth of 80.4 m, recovery being 99%, when operations ended. A third mud-line HPC, necessary at this site (Hole 630C) for inorganic-geochemistry sampling of the surface interstitial waters, was recovered successfully at 1942 hr, recovery being 100%. The *JOIDES Resolution* left Site 630 for BAH-11-A in southeastern Exuma Sound at 2300 hr, 21 February.

The coring summary for Sites 629 and 630 appears in Table 1.

SEDIMENTOLOGY

Introduction

Three holes were drilled at Site 630. Hole 630A penetrated 250.3 m below sea floor (bsf) and recovered 220 m of core (88%). Hole 630B penetrated 80.4 mbsf, recovery being 79.6 m (98%). Hole 630C penetrated 9.3 m sub-bottom and recovered 9.3 m (100%).

Hole 630A consists predominantly of soft and stiff calcareous ooze and minor amounts of chalk and, rarely, limestone. Most smear slides of the ooze contain needles, which are confirmed by x-ray-diffraction (XRD) analysis ("Inorganic Geochemistry" section, this chapter) to be aragonite. This sediment is more properly classified as periplatform ooze. The calcite fraction consists of foraminifers and nannofossils in varying proportions. Layers of unlithified to partly lithified packstone are rarely observed in the upper half of the sequence, whereas in the lower part they are more common. The ooze is white, showing a few subtle color variations (10YR 8/1, 5Y 8/1, 5Y 8/2). Bioturbation appears as mottling of grayish, greenish, or light brownish colors, and pyritic areas as relatively darker areas of light gray (10YR 8/2). The packstone layers typically have a more yellowish (2.5Y 8/2) or grayish (10YR 7/1) tone than does the white ooze background. Because of the homogeneous aspect of the sedimentary sequence, Hole 630A is subdivided into only two units. Unit I comprises the upper 146 m and consists of a pure calcareous ooze almost devoid of packstone layers; Unit II consists of the lower 105 m, where packstone layers alternating with calcareous ooze are numerous (see Fig. 2).

Unit I (0–146 m sub-bottom, Cores 630A-1H through 630A-16H-3)

Unit I consists of at least 90% calcareous ooze at different stages of induration. On average, the top of Unit I (0–75 m sub-bottom) varies between soft and stiff ooze, whereas the bottom (75–146 m sub-bottom) is almost entirely soft ooze. Packstone layers are rare throughout Unit I, although they occur more commonly at the extreme top (Core 630A-1H) and between 68 and 85 m sub-bottom (Cores 630A-8H and 630A-9H). The layers, typically a few cm to 10 cm thick, can be as thick as 50 cm in a few places. Maximum grain size at the base of layers is medium sand, consisting mainly of planktonic foraminifers. The thickest layers commonly display graded bedding. Accordingly, these packstone layers are interpreted as being turbidites.

Although the calcareous ooze is visually homogeneous throughout Unit I, smear slide estimates (generally three per core) of foraminifers, nannofossils, micrite, and aragonite needles exhibit trends that we used to divide Unit I into three subunits: a lower subunit, IC (90–146 m sub-bottom), a middle subunit, IB (28–90 m sub-bottom), and an upper subunit, IA (0–28 m sub-bottom) (see Fig. 2 and Table 2). Micrite in smear slide estimates includes both fine carbonate grains (a few to 25 μm) of uncertain origin and fine aragonite needles.

Subunit IC is enriched in foraminifers (30%) and has an intermediate nannofossil content (40%) and a micrite content (15%) with rare aragonite needles. Subunit IB shows a low foraminiferal content (10%), a high nannofossil content (50%), and an intermediate micrite content (25%) with common aragonite needles. Subunit IA displays a low content of both foraminifers (7.5%) and nannofossils (15%), whereas the micrite content is at its maximum (45%) with abundant aragonite needles. The foraminifer content clearly decreases upward, whereas micrite clearly increases upward, as does the proportion of aragonite needles. The nannofossil content shows a minimum in Subunit IA, a maximum in Subunit IB, and an intermediate value in Subunit IC. The upward trend of increasing micrite and aragonite indicates a gradual increase through time of the input and preservation of bank-derived particles. This interpretation is strengthened by the carbonate mineralogy of Unit I. The lower part of Unit I shows no aragonite, the middle part some aragonite (20%–25%), and the upper part the most aragonite (40%–45%) (see Fig. 3 and "Inorganic Geochemistry" section). The step boundaries of the aragonite content match those of the sedimentary sequence defined by smear slide estimates.

Several clay-rich layers are observed in Subunit IA, at 2.5 m sub-bottom and between 17 and 21 m sub-bottom (see Fig. 4). These layers correlate well in Holes 630A, 630B, and 630C. Similar layers have been observed at similar depths in Hole 628A and Holes 627A and 627B.

Unit II (146–250 m sub-bottom; Cores 630A-16H-4 through 630A-26X)

Unit II consists of chalk and ooze (60%) interbedded with unlithified to partly lithified packstone layers (40%). Packstone layers are thicker at the base (as thick as 100–120 cm) than at the top (a few cm to 20 cm) of Unit II, where they are more numerous (e.g., 37 layers in Core 630A-17H and 50 layers in Core 630A-18H). Grain size at the base of the layers ranges from fine to very coarse sand. Fine to medium sands are primarily foraminifers, and coarse sands are aggregates. Only one grainstone layer is reported (top of Core 630A-22X). Sharp bases and graded bedding are common features in these packstone layers, which therefore are interpreted as being turbidites.

Table 1. Coring summary, Sites 629 and 630.

Core no.	Core type[a]	Date (Feb. 1985)	Time	Sub-bottom depths (m)	Length cored (m)	Length recovered (m)	Percentage recovered
Hole 629A							
1	H	20	0001	0–6.9	6.9	2.91	42
2	H	20	0053	6.9–16.5	9.6	1.66	17
3	X	20	0230	6.9–16.5	9.6	1.64	17
Hole 630A							
1	H	20	1320	0–8.6	8.6	8.66	100
2	H	20	1415	8.6–18.2	9.6	10.11	105
3	H	20	1500	18.2–27.8	9.6	9.69	100
4	H	20	1545	27.8–37.4	9.6	9.33	97
5	H	20	1615	37.4–47.0	9.6	9.50	98
6	H	20	1700	47.0–56.9	9.9	9.38	94
7	H	20	1730	56.9–66.3	9.4	9.43	100
8	H	20	1805	66.3–75.9	9.6	9.49	98
9	H	20	1845	75.9–85.7	9.8	9.45	96
10	H	20	1915	85.7–95.1	9.4	9.55	101
11	H	20	1945	95.1–104.7	9.6	9.82	102
12	H	20	2015	104.7–114.3	9.6	9.66	100
13	H	20	2030	114.3–123.9	9.6	9.66	100
14	H	20	2100	123.9–133.5	9.6	9.80	102
15	H	20	2130	133.5–143.1	9.6	9.70	101
16	H	20	2200	143.1–152.8	9.7	9.38	96
17	H	20	2315	152.8–162.4	9.6	8.69	90
18	H	21	0030	162.4–172.1	9.7	8.77	90
19	X	21	0212	171.9–183.6	11.7	9.66	82
20	X	21	0305	183.6–193.2	9.6	8.60	89
21	X	21	0349	193.2–202.9	9.7	9.39	96
22	X	21	0430	202.9–212.5	9.6	1.22	12
23	X	21	0510	212.5–221.9	9.4	5.93	63
24	X	21	0615	221.9–231.3	9.4	5.32	56
25	X	21	0715	231.3–240.9	9.6	0.57	5
26	X	21	0850	240.9–250.3	9.4	9.42	100
Hole 630B							
1	H	21	1150	0–3.8	3.8	3.77	99
2	H	21	1345	3.8–13.4	9.6	9.54	99
3	H	21	1430	13.4–22.8	9.4	9.51	101
4	H	21	1515	22.8–32.5	9.7	9.66	99
5	H	21	1600	32.5–41.9	9.4	9.55	101
6	H	21	1630	41.9–51.5	9.6	9.05	94
7	H	21	1700	51.5–61.2	9.7	9.31	95
8	H	21	1745	61.7–70.8	9.1	9.11	100
9	H	21	1815	70.8–80.4	9.6	10.04	104
Hole 630C							
1	H	21	1942	0–9.3	9.3	9.31	100

[a] H = hydraulic piston; X = extended core barrel.

Forty percent of the interlayered sediment is a soft or stiff ooze; the other 60% consists of chalk. According to smear slide estimates, this material has a low foraminiferal content (15%), a relatively high micrite content (35%), and fairly abundant aragonite needles when compared with Subunit IC (see Fig. 2). The carbonate mineralogy shows 10%–15% aragonite in Unit II, which fits well (perhaps coincidentally) with the relatively high content of micrite and aragonite needles.

Discussion

Unit I ranges in age from late Miocene to Holocene ("Biostratigraphy" section, this chapter). The upper part of Unit I (Subunit IA) roughly corresponds to early to late Pleistocene and late Pliocene, Subunit IB to early Pliocene, and Subunit IC to very late Miocene and earliest Pliocene. Unit II was deposited only during the late Miocene and is coeval with Subunit IB in Hole 628A.

Study of Unit I suggests that bypassing of sandy turbidity currents through the closest gullies has occurred during the last 6 m.y., while ooze accumulated on the interfluve at an average sedimentation rate of 25 m/m.y. Rates of sedimentation were even higher, about 62 m/m.y., during part of the Pliocene. The upper part of Unit I (Subunit IA) seems to correspond to the well-established glacial interval of the late Pliocene and the Pleistocene, a time when bank-derived aragonite seems to have been the largest. This tentative interpretation will have to be confirmed by detailed oxygen isotope stratigraphy and analyses of the clay and feldspar composition.

Unit II can be interpreted as a turbidite apron at the toe of the late Miocene gullied slope. Unit II in Hole 630A seems to correlate well with the turbidite-rich sequence of Subunit IC in Hole 628A. In conclusion, Site 630 provides a detailed record of the evolution of a gullied slope, prograding over its turbidite apron since late Miocene time. This site also gives an excellent

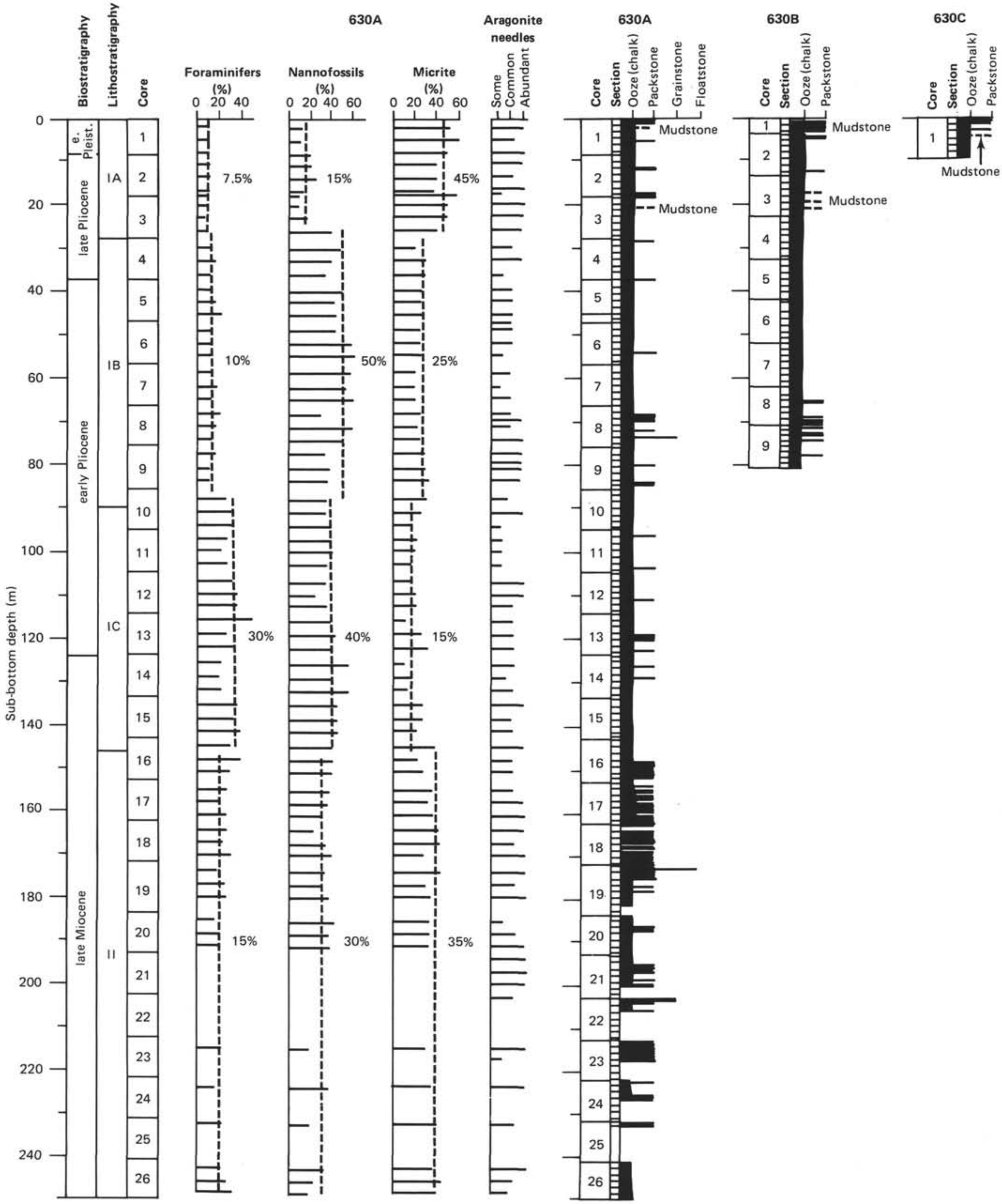

Figure 2. Comparison of sedimentary textures among Holes 630A, 630B, and 630C, and smear slide estimates of major components for Hole 630A.

Table 2. Composition of lithologic units, Sites 629 and 630.

Lithologic unit (subunit)	Sub-bottom depth (m)	Lithology: Dominant lithology	Lithology: Occurrence (%)	Total percentage of other constituents: Foraminifers (%)	Nannofossils (%)	Micrite (%)	Aragonite (%)
I	0–146	Calcareous ooze (periplatform ooze)	90				
		Packstone layers (turbidites)	10				
IA	0–28			7.5	15	45	40–50
IB	28–90			10	50	25	20–25
IC	90–146			30	40	15	0
II	146–250	Ooze and chalk (periplatform ooze)	60	15	30	35	10–15
		Packstone layers (turbidites)	40				

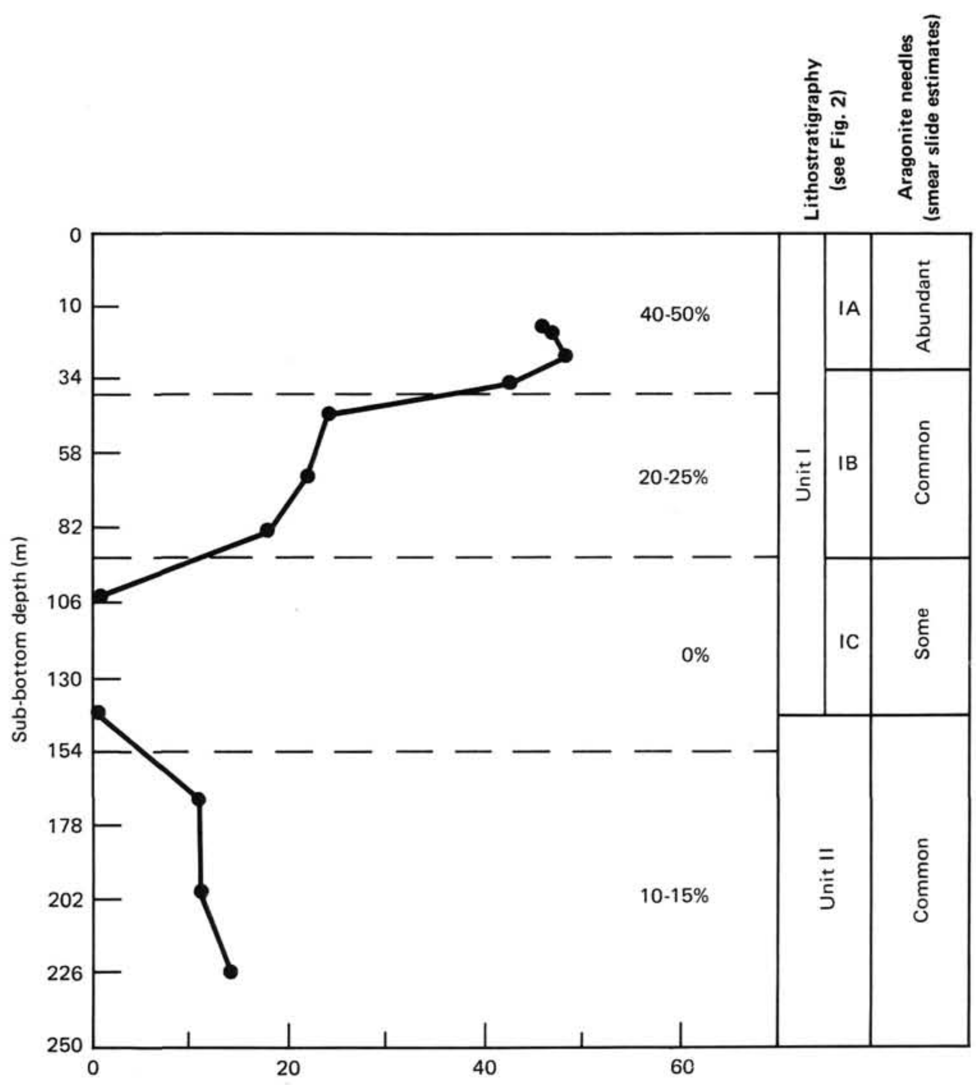

Figure 3. Aragonite content by x-ray diffraction vs. sub-bottom depth for Hole 630A, and comparison of lithostratigraphy with the aragonite-needle content in smear slides.

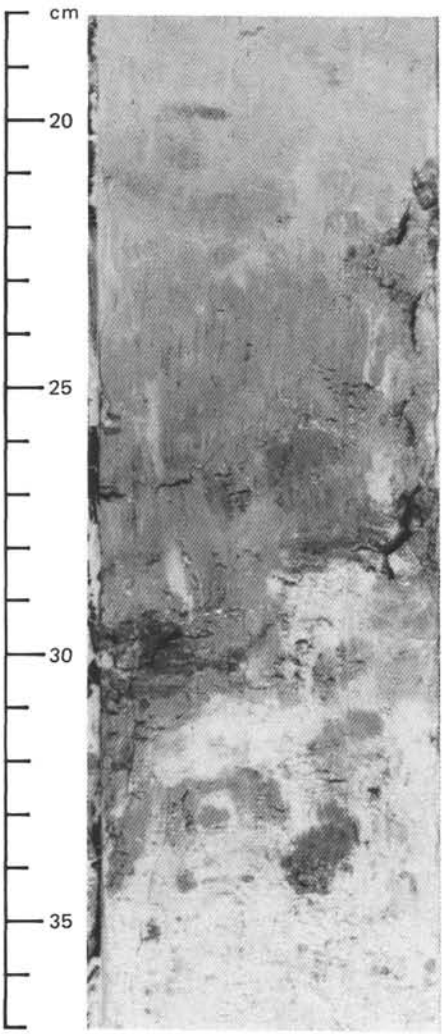

Figure 4. Clay-rich layers in Core 630A-3H-2, 23–29 cm.

record of the export of fine sediment by the Bahamas carbonate platform during the last 10 m.y.

BIOSTRATIGRAPHY

Introduction

Hole 629A was drilled to a total depth of 27.1 m sub-bottom. Three cores containing coarse rubble were obtained (Cores 629A-1H, 629A-2H, and 629A-3X).

A nearly continuous upper Neogene–Quaternary section was recovered at Site 630. Calcareous nannofossils and planktonic foraminifers are generally well to moderately preserved throughout the thick section of periplatform oozes and chalks. Hole 630A was drilled to a sub-bottom depth of 172.1 m (Cores 630A-1H to 630A-18H) with the HPC, then continued to a total depth of 250.3 m (Cores 630A-19X to 630A-25X) with the XCB.

Unless otherwise specified, all samples examined for this report came from core catchers.

Calcareous Nannofossils

Site 629

Cores 629A-1H through 629A-3H contain assemblages from Zone NN21, which is correlated to the late Pleistocene and Holocene. Winnowing of the sediment or washing during core recovery depleted the nannofossil abundance in the sediment.

Site 630

Sections 630A-1H-1 through 630A-1H-2 contain abundant *Emiliania huxleyi*, indicating the top (*E. huxleyi* acme) of Zone NN21. This zone correlates with the late Pleistocene to Holocene. The core catchers from Cores 630A-1H and 630A-2H contain mixed assemblages having both *E. huxleyi* (NN21) and *Pseudoemiliania lacunosa* (NN19 to NN16). This mixing is the result of either downhole contamination or reworking. Only strongly overgrown specimens of *Cyclococcolithina macintyrei* were observed, suggesting that these specimens were reworked. Therefore, the flora probably belongs to the younger part of the NN19, and the sediment is most likely Pleistocene.

Cores 630A-3H and 630A-4H contain assemblages composed of *Discoaster pentaradiatus, Discoaster brouweri*, and *Discoaster surculus*, as well as probable *Pseudoemiliania lacunosa*, all suggesting Zone NN16, which correlates with the earliest part of the late Pliocene. These assemblages continue downward from Core 630A-5H through 630A-8H, adding *Reticulofenestra pseudoumbilica* and *Discoaster asymmetricus* in the lower sections. The presence or absence of *Amaurolithus tricorniculatus* (which differentiates NN14 from NN15) was difficult to ascertain. As a result, this interval is assigned to Zones NN14/15, which correlates with the early Pliocene. The absence of *Discoaster asymmetricus* and *Discoaster quinqueramus* in assemblages from Cores 630A-9H through 630A-13H indicates that this interval is from Zones NN12/13 (latest Miocene to early Pliocene). The occurrence of *Discoaster quinqueramus* in assemblages from Cores 630-14H through 630A-21X indicates Zone NN11, although the assemblage in Core 630A-16H is too poorly preserved to yield a definitive age determination. No stratigraphically important species have been observed in the core catchers below Core 630A-21X because of poor preservation and very low nannofossil concentrations.

Foraminifers

Site 629

Three cores of upper Pleistocene sediments were recovered from Hole 629A. Planktonic foraminifers of the *Globorotalia truncatulinoides* Zone (N23) are abundant. A mixture of shelf and slope taxa characterizes the benthic-foraminiferal assemblages.

Site 630

A late Pleistocene age (*Globorotalia truncatulinoides* Zone, N23) is assigned to Core 630A-1H on the basis of the occurrence of *G. truncatulinoides* and the pink variety of *Globigerinoides ruber*. A hiatus may separate Quaternary from upper Pliocene sediments in Core 630A-2H. The presence of *Globorotalia miocenica* and the absence of *G. truncatulinoides* and early Pliocene taxa suggest a late Pliocene age (*Globorotalia miocenica* and *Globorotalia tosaensis* Zones; N19 part/N21) for the base of Core 630A-2H (18.2 m sub-bottom). The upper Pliocene *Globorotalia miocenica* Zone (N19 part) is recognized in Cores 630A-3H and 630A-4H (27.8 and 37.4 m sub-bottom), as indicated by the abundance of *G. miocenica* and the absence of early Pliocene species. The transition from upper to lower Pliocene occurs in Cores 630A-5H and 630A-6H. Cores 630A-7H through 630A-13H (56.9 to 123.9 m sub-bottom) are early Pliocene in age and are assigned to the *Globorotalia margaritae* Zone (N18/N19 part). Diagnostic taxa include *G. margaritae, G. plesiotumida, Globigerina nepenthes*, and *Globoquadrina altispira* (s.l.). *Globorotalia juanai* characterizes the transition from upper Miocene to lowest Pliocene and is present in Cores 630A-18H through 630A-12H.

The late Miocene *Neogloboquadrina acostaensis* Zone (N16/N17) is represented in Cores 630A-14H through 630A-26X

(123.9–250.3 m sub-bottom). *Neogloboquadrina acostaensis* is virtually absent in Cores 630A-14H and 630A-15H but increases in abundance downhole. *Globorotalia lenguaensis* and *G. merotumida* occur sporadically in Cores 630A-18H through 630A-26X. Other characteristic species of the late Miocene include *Globorotalia scitula, G. menardii, Globigerina nepenthes*, and *Globigerinoides extremus*.

Benthic foraminifers indicative of bathyal depths are found throughout the Neogene and Quaternary section of Hole 630A. Displaced neritic taxa occur sporadically in the upper part of the drilled interval but increase appreciably in Cores 630A-17H through 630A-26X. Larger foraminifers represented by badly preserved *Amphistegina* sp. are present in Core 630A-25X, CC.

Summary

Among the three sites of the slope transect north of Little Bahama Bank, Site 630 on the upper slope contains fewer larger foraminifers than do the other, deeper sites. In fact, from the Holocene to the upper Miocene section (250 m), only one sample (630-25X, CC) yields very badly preserved *Amphistegina*. This apparent lack of platform-derived material is even more unusual because turbidites are present throughout the 104 m of upper Miocene sediment.

SEDIMENT-ACCUMULATION RATES

An abbreviated interval of Pleistocene sediments (Cores 630A-2H and 630A-1H) overlies a thick, continuous sequence of upper Miocene–Pliocene strata (Cores 630A-26X through 630A-3H) in Hole 630A (Fig. 5). A hiatus of as much as 1 or 2 m.y. may separate the Neogene and Quaternary, although additional shore-based study is needed for better delineation of the magnitude of this suspected stratigraphic gap. A similar break occurs at Site 628, where at 146 m sub-bottom a facies change from ooze and turbidites below to ooze above occurs. An average sediment-accumulation rate of 27–28 m/m.y. characterizes the entire section drilled in Hole 630A. Rates in the Pliocene ooze section may range as high as 62 m/m.y., and rates in the Miocene turbidite unit are 27 m/m.y. or higher.

INORGANIC GEOCHEMISTRY

Interstitial-Water Studies

Concentrations of calcium and magnesium at Site 630 exhibit trends similar to those seen at Sites 626, 627, and 628 (Tables 3 and 4). Values of Ca gradually increase from their surface-seawater levels, whereas Mg concentrations decrease (see Fig. 6). The most marked change in these two elements occurs between surface seawater and water obtained from the first core. To investigate this gradient further, water samples were taken from every section in Core 630C-1H over the top 9 m. Results of this investigation (see Fig. 7) confirm trends seen in previous holes. However, whereas increases in the Ca concentration were gradual over this depth, investigations of Hole 630C showed that Mg levels exhibited a sharp decrease over a small interval. Either diagenetic processes affecting the Mg concentration of interstitial waters occur rapidly, or surface waters are significantly different in Mg concentration from water immediately above the sediment/seawater interface. In assessing these scenarios, it is useful to normalize the concentration of Ca^{2+} and Mg^{2+} to the Cl^- content. These values show that although the Mg/Cl ratio of surface water is similar to the first sediment sample of Hole 630C, the Ca/Cl ratio of pore water is much higher. This difference is probably a result of the low Ca/Cl ratio of surface waters rather than of any differential diagenetic reactions occurring in the sediments that may cause covariant trends.

Sites 627, 628, and 630: Summary

As discussed in the preceding section, interstitial waters from Sites 627, 628, and 630 exhibited similar Ca and Mg gradient trends. However, the magnitude of these gradients shows a constant change from the deeper site, Hole 627A, to the shallower site, Hole 630A (see Tables 5 and 6). The percentage of change in these gradients is much larger than the relative difference in water depth between the three sites (see "Operations Summary," this chapter, and Site 627 chapter, this volume). For example, the gradient in Hole 627A over the top 250 m is 5.1×10^{-2} mmol/L/m, compared with a gradient in Hole 630A over the same interval of 2.6×10^{-2} mmol/L/m (the normalization to Cl^- does not significantly change these gradients). The Ca gradient cannot be explained by pressure alone but must result from diffusion of pore waters depleted in Mg and enriched in Ca from an underlying unit. The large difference in Ca gradients is therefore probably not a result of variations in sedimentation rates between the sites (see "Sedimentology" section, this chapter, and Site 627 chapter, this volume), because Ca concentrations reported at DSDP sites containing large amounts of carbonate (such as Site 245; Gieskes et al., 1981) show concentrations typically of 30 mmol/L adjacent to oceanic basalts. In Hole 627A, however, Ca concentrations of 35 mmol/L were reported within the Cenomanian marl section, which is at least 1 km above basement. This suggests that the Cenomanian interval, which is rich in igneous and terrigenous materials, may influence the Ca rise and Mg depletion in the overlying sediments. Using the difference in gradients between Sites 627 and 630 and assuming that the Cenomanian is indeed the source of Ca, we can estimate that approximately 600 m of sediments lies above the Cenomanian at Hole 630. This is the approximate thickness of sediments estimated from seismic profiles (see "Seismic Stratigraphy" section, this chapter).

A further important observation made at the three sites off Little Bahama Bank, as well as at Site 626, is the apparent absence of significant amounts of sulfate depletion in the interstitial pore waters (Figs. 8 and 9). This lack of depletion may be a result of the low initial amounts of organic matter, the low sedimentation rates, and/or an external source of sulfate ions.

X-Ray Studies

Sediments from Site 630 can be divided into two units, according to changes in the percentage of aragonite and calcite (see Figs. 10–12). The uppermost unit, corresponding to the Pleistocene and the lower to the upper(?) Pliocene section, is characterized by amounts of aragonite greater than 40%. Beneath this interval, aragonite content falls to levels of between 0% and 20%. Dolomite forms a small but persistent proportion of the sediments throughout Hole 630A, yet shows no consistent pattern with depth or age (see Tables 7–9).

High-Mg calcite was detected only in the top 5 m of the section (Table 9). Its disappearance may be attributed to either a change of sedimentation patterns or a removal through diagenetic processes.

Summary of X-Ray Data: Sites 627, 628, and 630

In all three sites across the Little Bahama Bank transect, consistent changes were visible in the proportions of aragonite, calcite, dolomite, and quartz (see Fig. 13). The first change correlatable between the three sites occurs in the Pleistocene section, the uppermost part of which is typified by low aragonite concentrations. Proportions of aragonite increase downhole and reach a maximum at the Pliocene–Pleistocene boundary. The Pliocene is characterized by a sudden reduction in the amount of aragonite from approximately 70% to between 0% and 20% toward

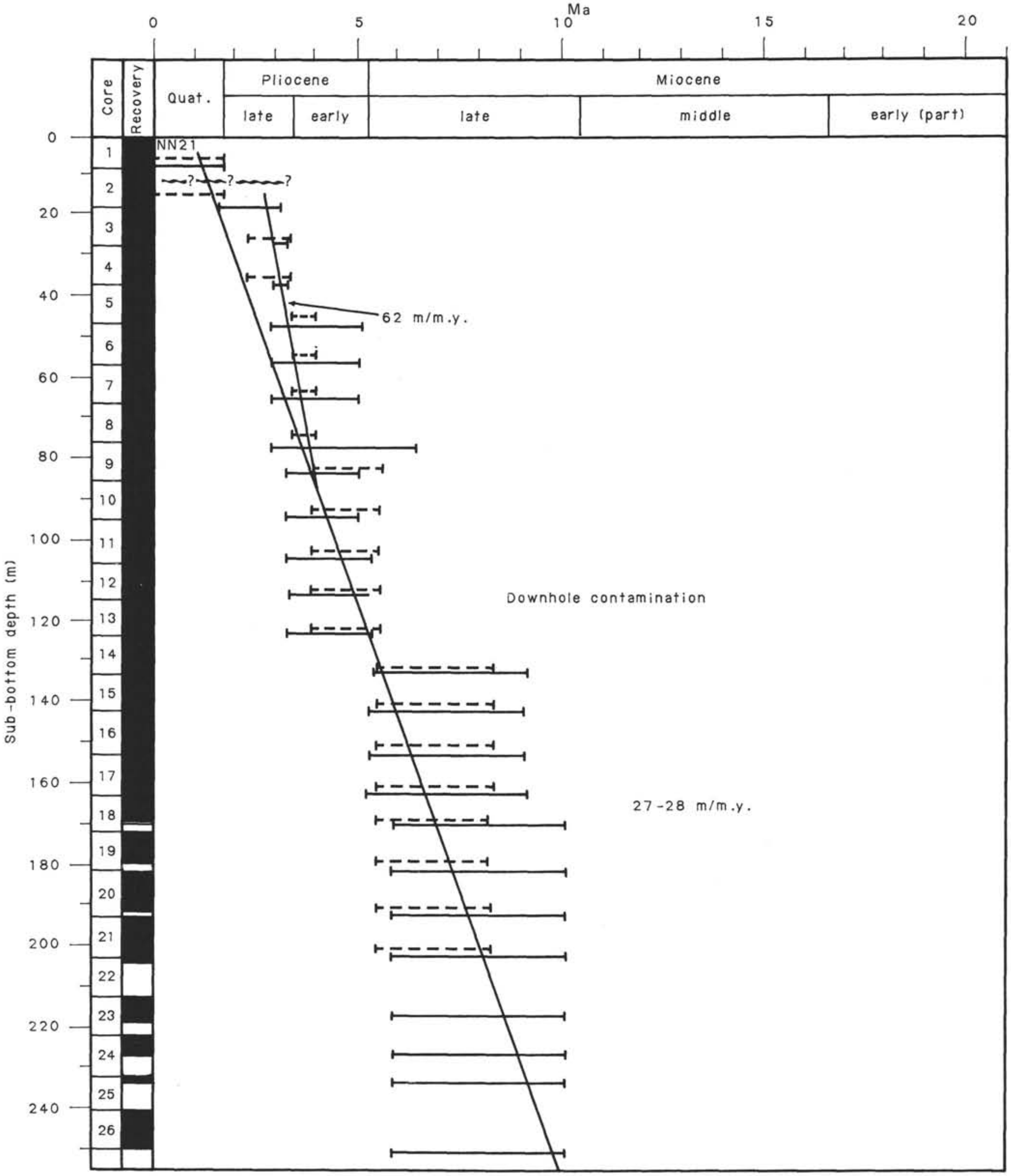

Figure 5. Sediment-accumulation rates, Site 630.

the start of the Miocene section. The third unit, present in all three holes, extends downward through the Miocene to the upper(?) Oligocene and also contains aragonite but in reduced and somewhat variable amounts (see Fig. 13). Absent at Site 630, the Oligocene in Holes 627 and 628 consists predominantly of low-Mg calcite and a small amount of quartz.

The cause of the decline in aragonite content near the surface at these three sites is unknown; perhaps because of the proximity to the surface, it is not primarily diagenetic. In the Pliocene–Pleistocene, the changes in mineralogy are consistent with a reduction in the transport of platform sediment and a general trend from distal to oceanic slope facies. The appearance of

Table 3. Analyses of interstitial waters from Hole 630A.

Sub-bottom depth (m)	pH	Alkalinity (meq/kg)	Salinity (‰)	Chlorinity (‰)	Ca (mmol/L)	Mg (mmol/L)	SO_4 (mmol/L)
Surface seawater	8.21	2.41	36.2	21.05	10.43	58.00	29.48
7.4	7.65	3.00	35.0	20.81	11.44	52.87	25.05
16.0	7.67	2.89	35.2	20.28	12.03	52.45	28.95
25.6	7.72	3.09	35.1	19.27	11.78	52.65	29.08
35.2	7.80	3.29	35.0	20.18	11.57	54.39	28.54
44.8	7.63	3.08	35.1	20.56	12.25	53.12	28.81
64.3	7.55	2.99	35.7	20.07	12.52	52.82	28.78
83.3	7.35	3.41	35.9	20.84	14.30	50.71	27.38
112.1	7.47	3.80	36.2	20.63	14.97	49.81	26.93
140.9	7.36	4.05	37.0	21.16	14.64	48.96	27.49
169.8	7.43	4.22	37.5	21.82	16.58	50.55	29.08
200.6	7.51	4.69	37.8	21.58	16.20	50.93	25.68
224.8	7.52	5.07	39.6	21.33	17.07	51.36	27.31

Table 4. Analyses of interstitial waters from Hole 630C.

Sub-bottom depth (m)	pH	Alkalinity (meq/kg)	Salinity (‰)	Chlorinity (‰)	Ca (mmol/L)	Mg (mmol/L)	SO_4 (mmol/L)
1.45	7.75	3.03	34.8	19.72	10.74	53.92	28.49
2.95	7.70	2.87	34.8	19.34	10.85	53.72	34.17
4.45	7.62	2.78	34.8	20.00	10.78	53.85	23.24
5.95	7.62	2.89	35.0	20.72	10.97	52.51	31.72
7.45	7.65	3.08	35.0	20.14	11.42	51.94	32.00
8.95	7.61	2.85	35.2	20.49	11.50	52.69	32.93

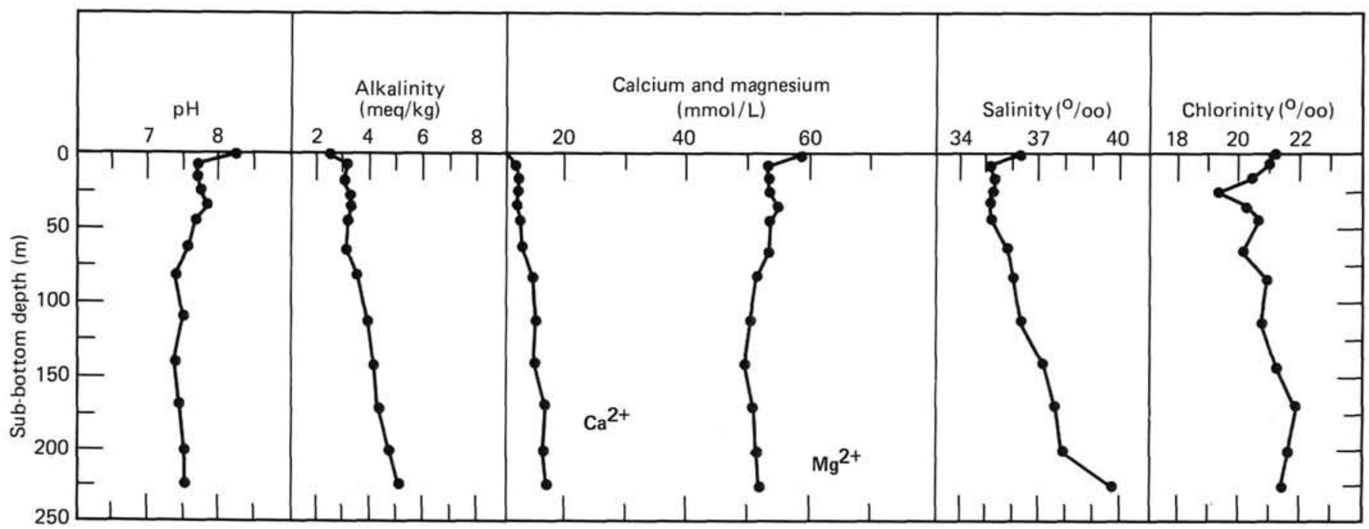

Figure 6. Summary of interstitial-water analyses, Hole 630A.

quartz in the lower Oligocene sediments could indicate the influence of deep oceanic currents in this area at that time.

The dolomite, typically moderately calcian (45–47 mol% $MgCO_3$), found in these sediments may be either detrital or diagenetic and occurs only within the Quaternary and Tertiary of Holes 627 and 628 to the Pleistocene and late Pliocene. In contrast, dolomite is ubiquitously distributed within Hole 630. Dolomite is also present in Albian rocks recovered from Hole 627B, although these rocks are clearly of a different origin than those of the Pliocene–Pleistocene occurrences.

Carbonate-Bomb Data

The percentage of carbonate was generally significantly lower at Site 630 than at either Site 627 or 628 (Fig. 14 and Table 10). Although this may be a result of the proximal nature of the site, it should also be recognized that extremely rough surface conditions prevailed during drilling, making accurate weighing impossible. Results are therefore subject to confirmation by further shore-based studies.

ORGANIC GEOCHEMISTRY

Twenty-three rock samples were taken from Hole 630A for Rock-Eval analysis (see Figs. 15–18). The lithology consists essentially of periplatform carbonate ooze (late Miocene to Holocene).

The organic material, as in most of the Neogene–Holocene sites investigated on Leg 101, consists of low amounts of detri-

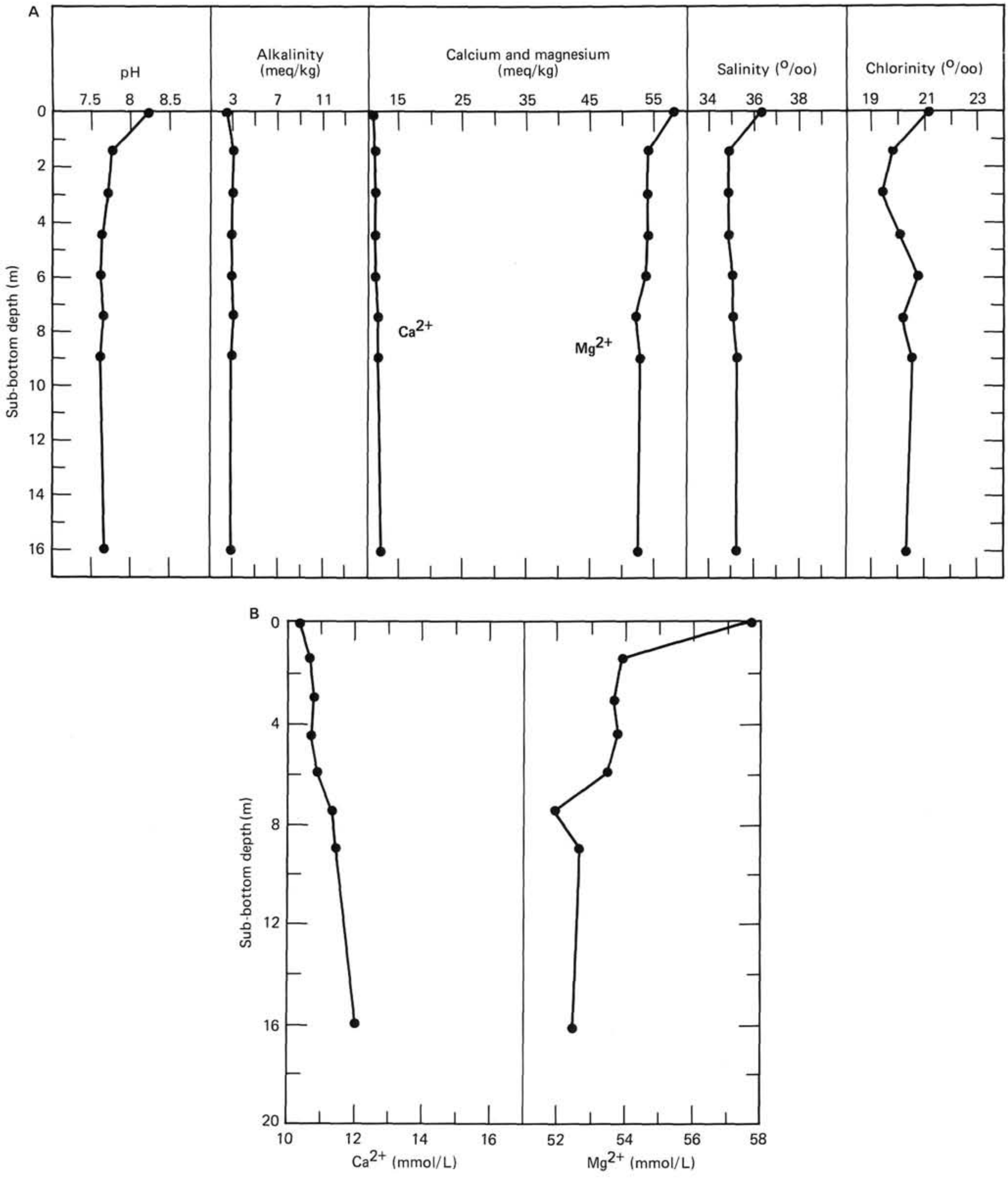

Figure 7. A. Summary of interstitial-water analyses, Hole 630C. B. Interstitial Ca^{2+} and Mg^{2+} concentrations, Hole 630C.

tal, oxidized, terrestrial organic matter (see Fig. 16). T_{max} investigations showed a great mixture of material of differing maturities and probably different provenances (see Fig. 17).

An increased lipid component was somewhat indicated in the kerogen of the lower part of Unit II (late Miocene ooze and turbidites, see "Sedimentology" section, this chapter; Fig. 18).

PALEOMAGNETISM

Hole 630A yielded an expanded Pliocene and upper Miocene sedimentary section that may be useful for magnetostratigraphic studies and their correlation with other contemporary phenomena. However, the material recovered from Hole 630A was

Table 5. Summary of calcium gradients, Sites 627, 628, and 630.[a]

Site	10-m sub-bottom depth	250-m sub-bottom depth
627	7.5	5.1×10^{-2}
628	14.0	3.2×10^{-2}
630	13.5	2.6×10^{-2}

[a] Units expressed in mmol L^{-1} m^{-1}.

Table 6. Summary of magnesium gradients, Sites 627, 628, and 630.[a]

Site	10-m sub-bottom depth	250-m sub-bottom depth
627	−53	[b]-2×10^{-2}
628	−73	-3×10^{-2}
630	−69	-1×10^{-2}

[a] Units expressed in mmol L^{-1} m^{-1}.
[b] Data averaged over entire core depth.

primarily calcareous ooze, which seemed unlikely to contain a magnetization of sufficient strength to be detectable by the shipboard Molspin spinner magnetometer. Consequently, only seven 7-cm^3 oriented samples were taken from two cores to aid in determining whether or not further sampling was warranted. A detailed paleomagnetic analysis of these cores was deferred until a later date contingent on the results of these sample analyses and on the usefulness of paleomagnetic data from the same types of sediments in other holes from Leg 101.

Because the magnetic-susceptibility measurements in Hole 628A suggested that very little magnetic material would be in the sediments at Site 630, the number of measurements taken from Hole 630A cores was reduced. Only Sections 2, 4, and 6 of each core were measured. As in Hole 628A, the susceptibility shows virtually no variation from a value of approximately -0.4×10^{-6} G/Oe. However, unlike those for the previous holes, the susceptibility vs. depth plot shows few large amplitude spikes (Fig. 19). This is undoubtedly the effect of the exclusion of the data from the first section of each core that commonly appears to be contaminated with metallic flakes.

PHYSICAL PROPERTIES

Physical-property measurements were made on sediment recovered from Site 630A (see Table 11) as described in the "Introduction and Explanatory Notes" (this volume).

Compressional Wave Velocity

Compressional wave velocities measured on samples removed from the core liner average 1700 m/s and show little variation with increasing depth (Fig. 20).

Compressional wave velocities measured on sediment in the core liner (three measurements each on Sections 2, 4, and 6 of each core) show two zones of constant velocity. From 0 to 150 m sub-bottom, values average 1700 m/s. Between 150 and 200 m sub-bottom, velocities average 1800 m/s.

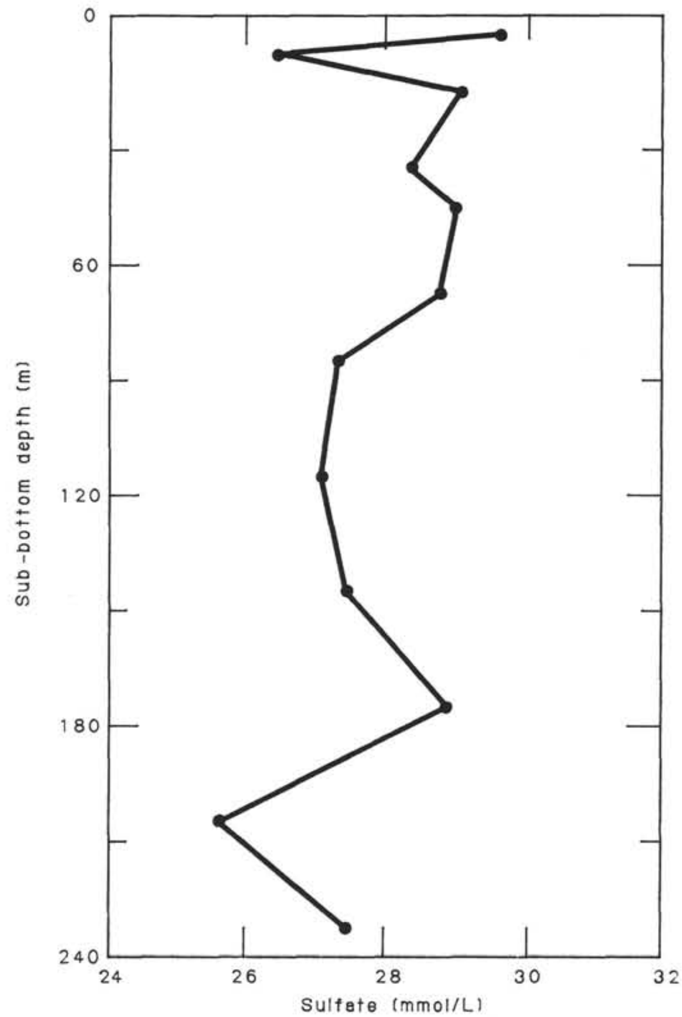

Figure 8. Interstitial-sulfate concentrations, Hole 630A.

Wet-Bulk Density, Porosity, and Water Content

Density values increase steadily with increasing depth from 1.6 g/cm^3 at 1.5 m sub-bottom to 1.9 g/cm^3 at 250 m sub-bottom. There is very little variation around the mean (Fig. 20).

Porosity values decrease with depth from 60% at 1.5 m sub-bottom to 50% at 250 m sub-bottom. The two low values of 40% at 85 m and 40% at 220 m are single samples.

Water content decreases regularly with depth from 53% at 1.5 m sub-bottom to 35% at 250 m sub-bottom. The decrease in water content correlates with the decrease in porosity and increase in density.

Thermal Conductivity

Conductivity increases regularly and slowly with increasing depth from 2.7×10^{-3} cal $\times$ °C^{-1} $\times$ cm^{-1} $\times$ s^{-1} at 1 m sub-bottom to 3×10^{-3} cal $\times$ °C^{-1} $\times$ cm^{-1} $\times$ s^{-1} at 250 m sub-bottom. Values vary little except in the deepest parts of the hole (more than 240 m sub-bottom) where measurements were made on core catchers.

Shear Strength

Shear strength increases slowly and regularly with increasing depth from 4 kPa at 1.5 m sub-bottom to 7 kPa at 250 m sub-bottom.

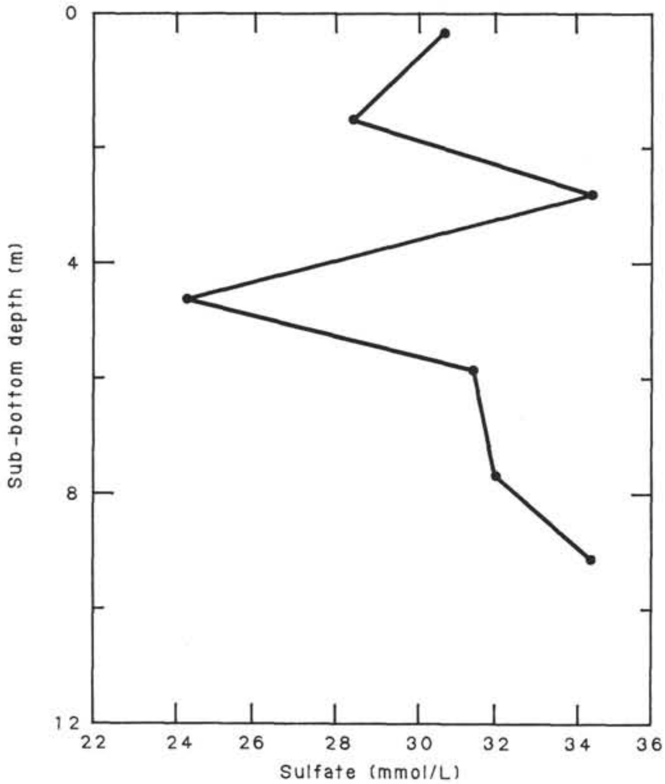

Figure 9. Interstitial-sulfate concentrations, Hole 630C.

Discussion

Physical-property parameters reflect general trends with depth, as would be expected of a homogeneous lithologic section having increasing overburden pressure. Only compressional wave velocity measurements made within the core liner show a change in overall trend. At 148 m sub-bottom, higher velocity averages (1800 m/s) correlate with an increase in induration of the background sedimentation and an increase in number of turbidite layers.

SEISMIC STRATIGRAPHY

Introduction

Site 630 completely sampled the top 200-300 m of the upper part of an accretionary carbonate slope. Because this site is located on an interfluve between gullies (see "Operations Summary," this chapter), regional seismic stratigraphic correlations could be made with confidence only along the trend of the interfluve (i.e., upslope/downslope) or laterally within it (i.e., along the slope contours). Despite this complexity, we propose that a sequence boundary sampled at the bottom of Site 630 immediately overlies the B/C sequence boundary at Site 628 approximately five n. mi downslope.

Seismic Correlations: Hole 630A

Site 630 lies just west of the intersection of site-survey lines LBB-05 and LBB-10 (Fig. 1, this chapter). Two sequence boundaries are recognized in the upper 300 m of section at this intersection. The upper surface is discernible only on LBB-10, occurring at 0.06 s sub-bottom (Fig. 21). At an interval velocity of 1.75 km/s, equal to that used for upper sequences on LBB-18 at Sites 627 and 628, the converted depth is 52 m. Neither a lithologic boundary nor a biostratigraphic hiatus exists within this depth range in Hole 630A. However, this seismic boundary ap-

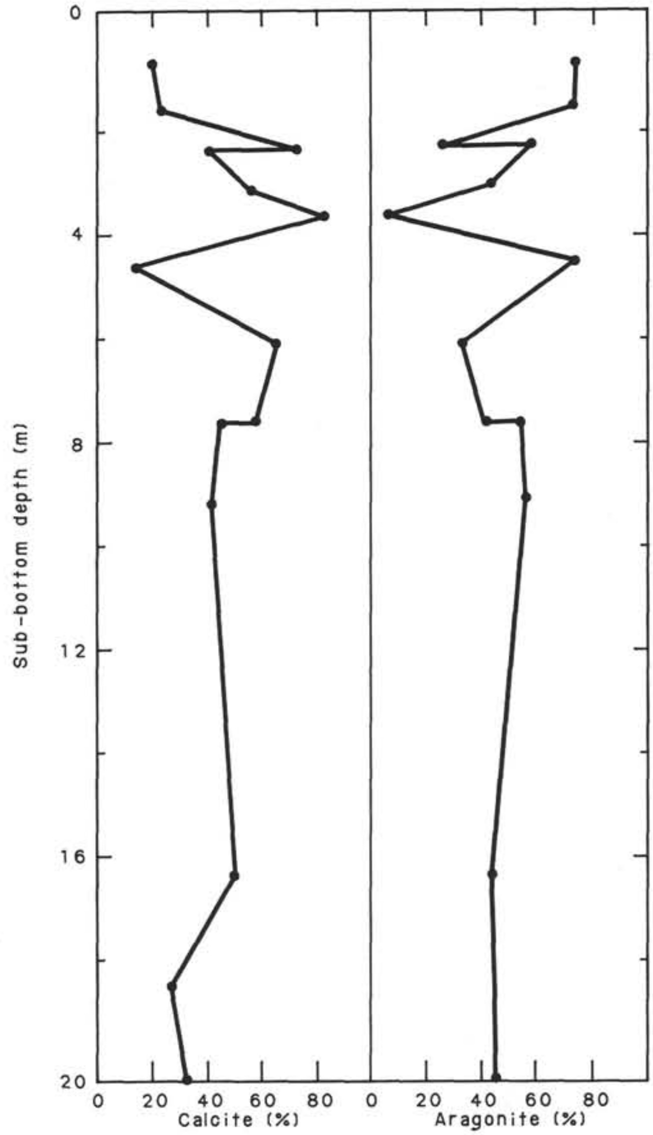

Figure 10. Percentages of calcite and aragonite from Holes 630A and 630C as measured by x-ray diffraction for the top 20 m.

pears to intersect the seafloor downslope of LBB-05 (Fig. 21), suggesting that its sub-bottom depth may decrease rapidly with increasing water depth. Hole 630A is slightly downslope of the line intersection (see "Operations Summary," this chapter). Perhaps this upper sequence boundary was produced by the same erosional episode that caused an abbreviation of the Quaternary sequence between Cores 630A-1H and 630A-2H (see "Biostratigraphy" section, this chapter).

The deeper sequence boundary visible on LBB-10 is a prominent impedance contrast and apparent unconformity, which occurs at 0.28 s sub-bottom and 0.26 s sub-bottom on LBB-05, in both cases at the base of an acoustically transparent interval (Figs. 21 and 22). If a compressional wave velocity of 1.75 k/s is used to convert the entire overlying section from traveltime to depth, the sequence boundary occurs at 228–245 m sub-bottom, within a zone of poor recovery in Hole 630A (Cores 630A-22X through 630A-26X, 202.9–240.9 m sub-bottom). If this poor recovery is caused by either lithologic or diagenetic changes, then a possible correlation with those changes and the acoustic horizon is suggested.

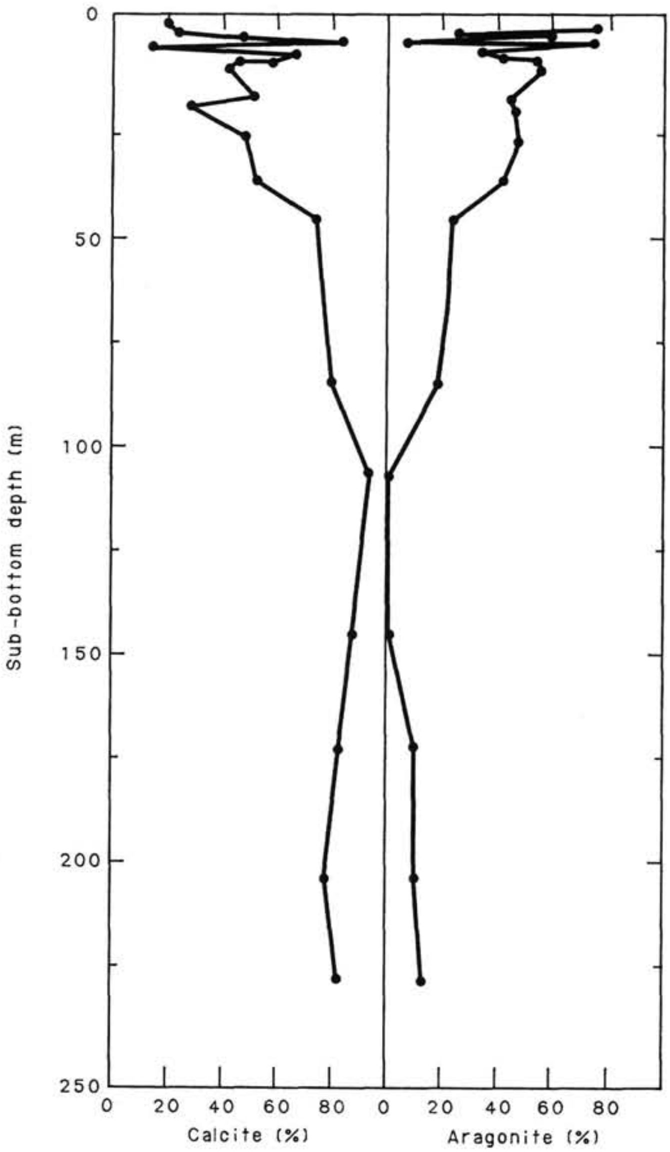

Figure 11. Percentages of calcite and aragonite from Holes 630A and 630C as measured by x-ray diffraction.

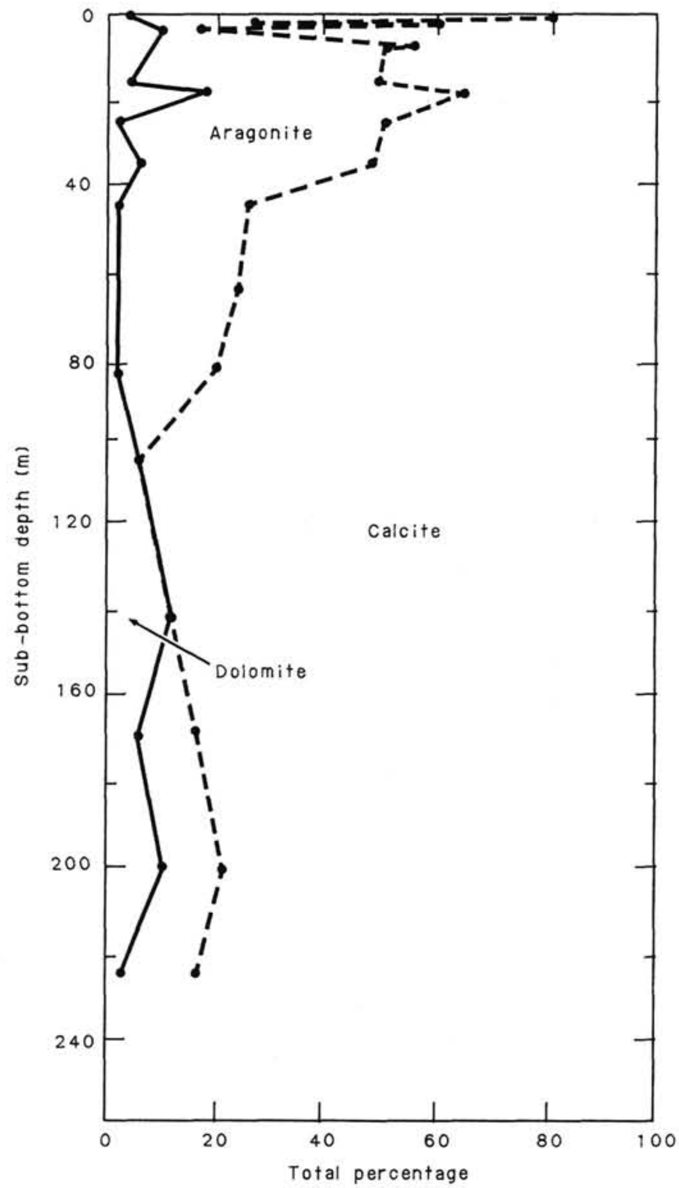

Figure 12. X-ray data, Site 630.

Table 7. X-ray analyses of samples from Hole 630A.

Sub-bottom depth (m)	Calcite (%)	Aragonite (%)	Dolomite (%)	Quartz (%)	Other minerals present
0.7	21	76	4	0	Mixed-layer illite-montmorillonite
2.2	77	27	0	0	
2.22	41	59	0	0	Mixed-layer illite-montmorillonite
3.5	83	7	10	0	Mixed-layer illite-montmorillonite
7.4	45	55	0	0	Mixed-layer illite-montmorillonite
8.1	50	50	0	0	
16.0	51	45	4	0	
18.2	28	46	18	0	Plagioclase
25.6	48	48	2	0	
35.2	52	42	6	0	Palygorskite
44.8	74	24	2	0	
64.3	77	22	2	0	Mixed-layer illite-montmorillonite
83.3	80	18	2	0	
105.1	94	0	6	0	
140.9	88	0	12	0	
169.8	83	11	6	0	Sepiolite
200.6	78	11	11	0	
224.8	83	14	3	0	

Table 8. X-ray analyses of samples from Hole 630B.

Sub-bottom depth (m)	Calcite (%)	Aragonite (%)	Dolomite (%)	Quartz (%)
3.04	64	36	0	0
3.34	47	51	2	0

Possible Tie with Site 628

Because Site 630 was located on LBB-10, possible correlations downslope with Site 628 involve tying LBB-10 to LBB-18 along LBB-05 (Fig. 1, this chapter). In an attempt to do this, the A/B and B/C sequence boundaries were first carried on LBB-18 from Site 628 approximately 9 km upslope to LBB-05 (Fig. 23). Only the B/C boundary, correlated with a late middle–early late Miocene hiatus in Hole 628A, could be carried for the entire distance. At the LBB-05/LBB-18 intersection, the B/C boundary occurs at 0.305–0.325 s, suggesting a depth range of 267–284 m sub-bottom, again according to a conversion velocity of 1.75 k/s.

Along LBB-05 between LBB-18 and LBB-10, the B/C boundary exhibits as much as 0.06 s of relief (Fig. 22). At Site 630, the B/C boundary occurs at a depth of 0.315 s, or 276 m sub-bottom. This is approximately 26 m below the total depth drilled in Hole 630A, which translates to approximately 1 m.y. of section using the 27–28 m/m.y. sedimentation rate derived for the lower part of Hole 630A (see "Sediment-Accumulation Rate" section, this chapter). Core 630A-26X, the deepest core of Hole 630A, is dated as earliest late to late Miocene, which is consistent with the late middle–early late Miocene age postulated for the B/C boundary at Site 628. Although the B/C sequence boundary was not actually sampled at Site 630, a tie between Sites 628 and 630 using the B/C boundary as a marker seems reasonable at this time.

SUMMARY AND CONCLUSIONS

Site 630 is at the upslope end of the three-site slope transect north of Little Bahama Bank. Hole 630A penetrated 250 m of sediment with HPC/XCB coring. Hole 630B duplicated the top 80 m of Hole 630A with the HPC. Finally, Hole 630C recovered a mud-line core.

The stratigraphic section at Site 630 consists of the following units ("Sedimentology" and "Biostratigraphy" sections, this chapter, and Fig. 24): (1) periplatform ooze (nannofossil-foraminifer ooze plus bank-derived aragonite) with some chalk, steplike decrease of aragonite from 40% to 50% at the top to below XRD detection limits near 100 m, late Miocene to Holocene, 146 m; and (2) periplatform ooze and chalk with 40% turbidites of mainly bank-derived skeletal material, late Miocene, 104 m.

Unlike Sites 627 and 628, which are on the rise at the foot of the Little Bahama Bank platform, Site 630 lies on the slope (s.s.) at an angle of 2° to 3°. Present-day slope topography shows widely spaced gullies that are interpreted as being the erosional pathways of turbidity currents (Mullins et al., 1984). Quaternary sediment cover on this gullied slope consists mainly of periplatform ooze. The coarser debris shed by the platform bypasses the slope in turbidity currents, forming an apron of turbidites and debris sheets on the rise (Mullins et al., 1984). An undisturbed section of upper Miocene–Holocene periplatform ooze at Site 630 indicates that bypassing has persisted for the last 6 m.y. Before 6 Ma, the site formed part of the turbidite apron on the rise. This succession is consistent with the progradation of the platform flank inferred from the lithologic and seismic facies at Sites 627 and 628 (see Site 627 and 628 chapters, this volume).

Despite bypassing by sandy turbidity currents, sedimentation rates in the periplatform ooze are high, somewhere between 27 and 62 m/m.y. (see "Sediment-Accumulation Rate" section, this chapter). Rates in the underlying turbidite facies are not well constrained. Biostratigraphic studies indicate, however, that they are at least as high as in the overlying unit of periplatform ooze.

Superimposed on the changes of depositional facies is a diagenetic trend that converts periplatform ooze rich in bank-derived aragonite into chalk ("Inorganic Geochemistry" section, this chapter). Major factors in this process seem to be dissolution of aragonite and upward migration of calcium-rich pore waters from the Cretaceous.

The correlation of borehole and seismic stratigraphy is more ambiguous at Site 630 than at the preceding sites ("Physical Properties" and "Seismic Stratigraphy" sections, this chapter). A seismic unconformity on LBB-10 corresponds to an early Pleistocene hiatus probably between Cores 630A-1H and 630A-2H. Another seismic unconformity at the top of an interval of high-amplitude reflections at 0.28 s correlates either with a bundle of turbidites having a top at 203 m sub-bottom or with an increase in lithification, i.e., a diagenetic boundary, below 200 m sub-bottom that is represented by a zone of poor recovery in Hole 630A.

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Van Buren, H. M., and Mullins, H. T., 1983. Seismic stratigraphy and geologic development of an open-ocean carbonate slope: The northern margin of Little Bahama Bank. *In* Sheridan, R. E., Gradstein, F. M., et al., *Init. Repts. DSDP*, 76: Washington (U.S. Govt. Printing Office), 749–762.

Table 9. X-ray analyses of samples from Hole 630C.

Sub-bottom depth (m)	Calcite (%)	Aragonite (%)	Dolomite (%)	Quartz (%)	Comments
1.45	23	75	3	0	Illite-montmorillonite present; high-Mg calcite, 16%; low-Mg calcite, 7%
2.95	56	44	0	0	Illite-montmorillonite present
4.45	21	75	4	0	Illite-montmorillonite present; high-Mg calcite, 7%; low-Mg calcite, 14%
5.95	66	34	0	0	
7.45	58	42	0	0	
8.95	42	57	1	0	

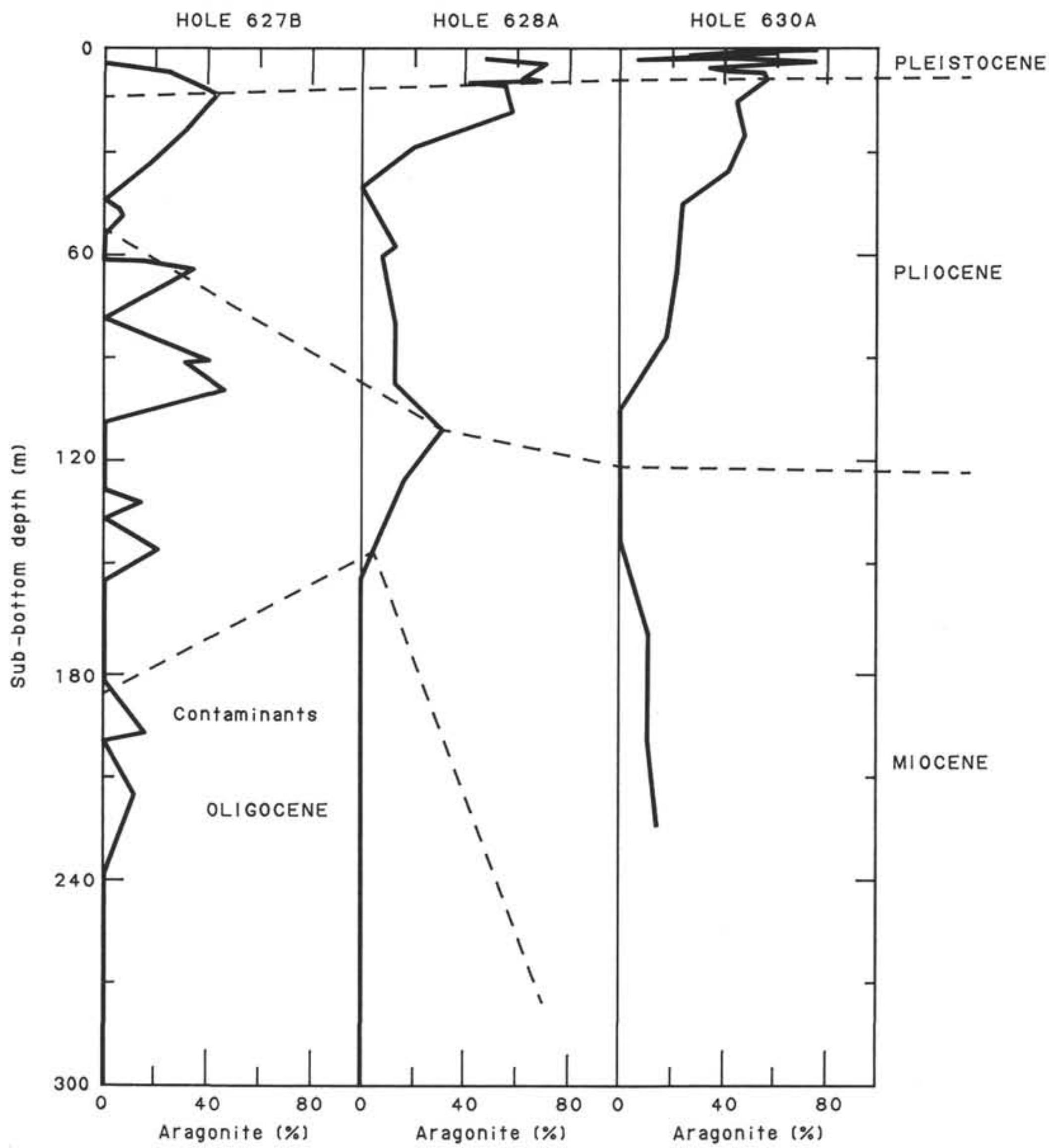


Figure 13. Summary of percentages of aragonite at Sites 627, 628, and 630. Stratigraphic lines are based on ages reported in the "Biostratigraphy" section (this chapter).

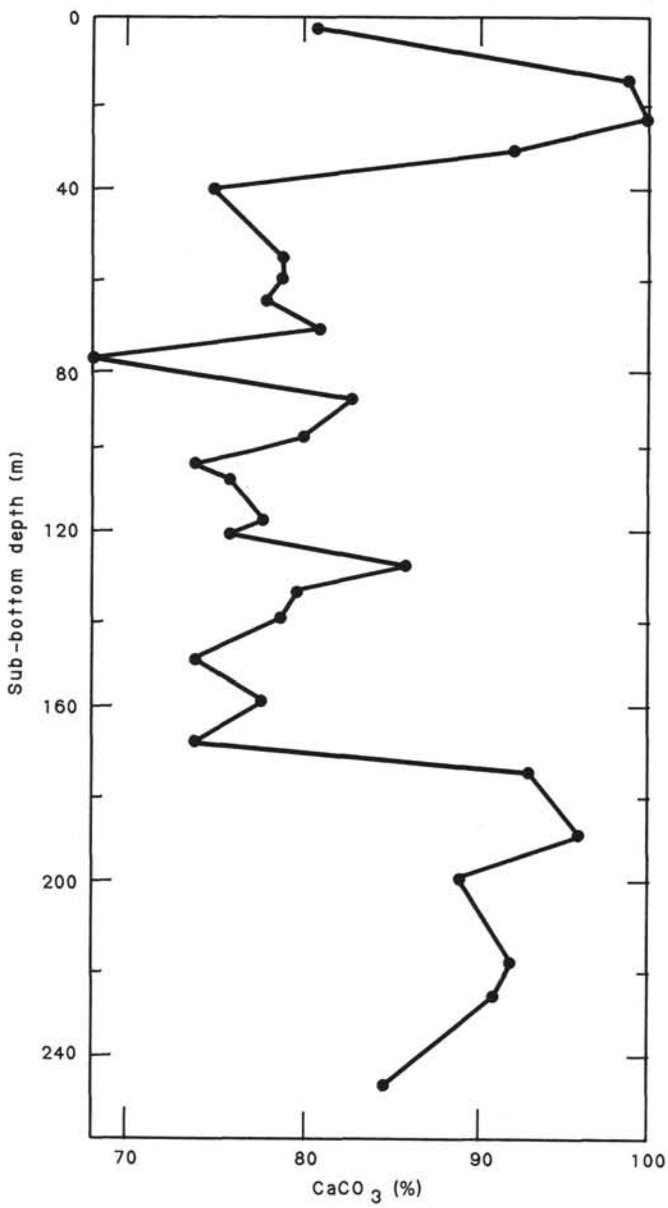


Figure 14. Carbonate-bomb data, Site 630.

Table 10. Carbonate-bomb data, Site 630.

Sub-bottom depth (m)	$CaCO_3$ content (%)
2.2	81
13.8	99
23.4	100
30.0	92
39.6	75
55.2	79
59.1	79
65.1	78
71.5	81
78.1	68
87.9	83
97.3	80
100.3	77
103.3	74
106.9	76
116.5	78
119.5	76
126.1	86
132.1	80
138.7	79
148.3	74
158.0	78
167.6	74
174.1	93
188.8	96
198.4	89
217.7	92
225.6	91
246.1	85

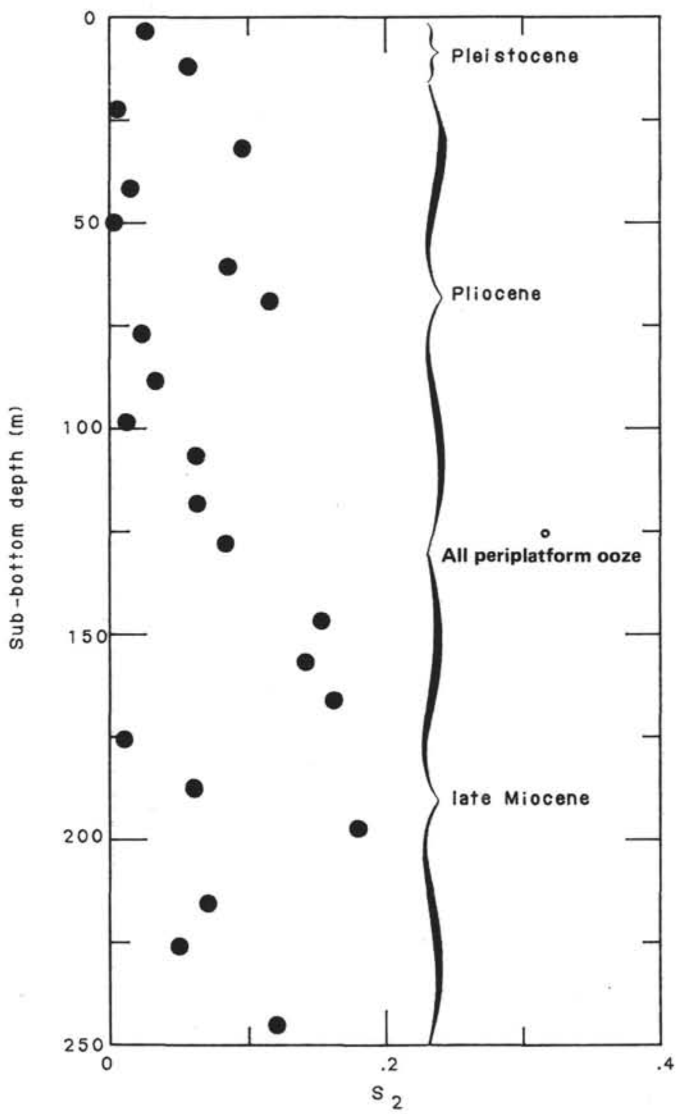


Figure 15. S_2 downhole variation, Hole 630A.

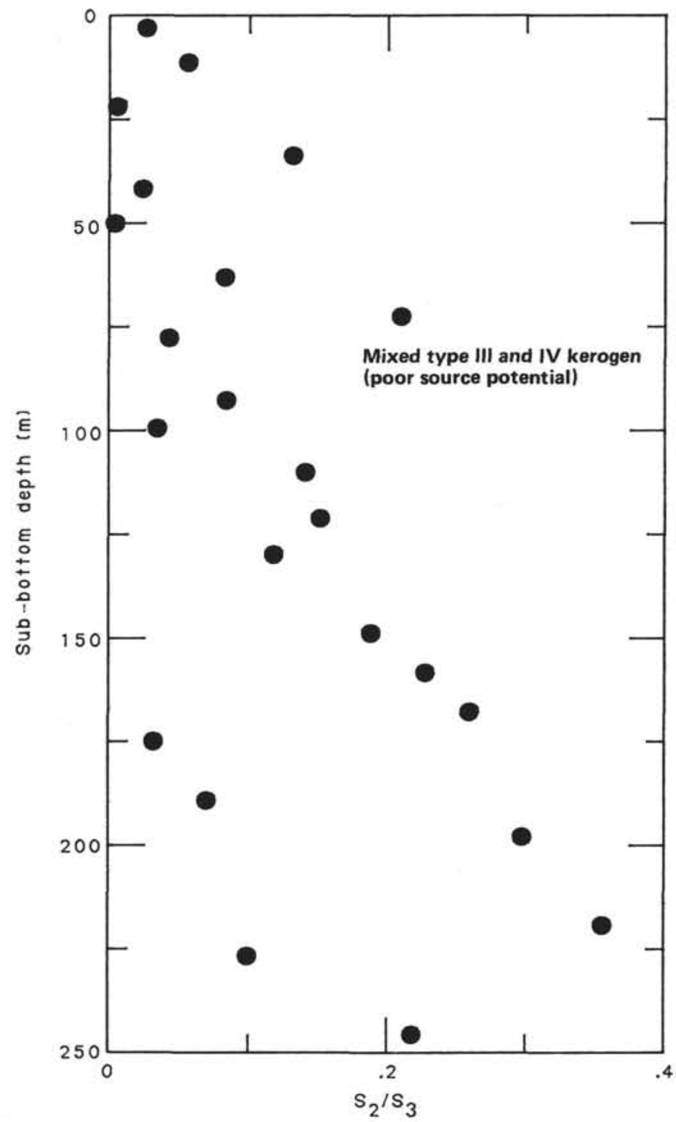


Figure 16. S_2/S_3 (kerogen typing) downhole, Hole 630A.

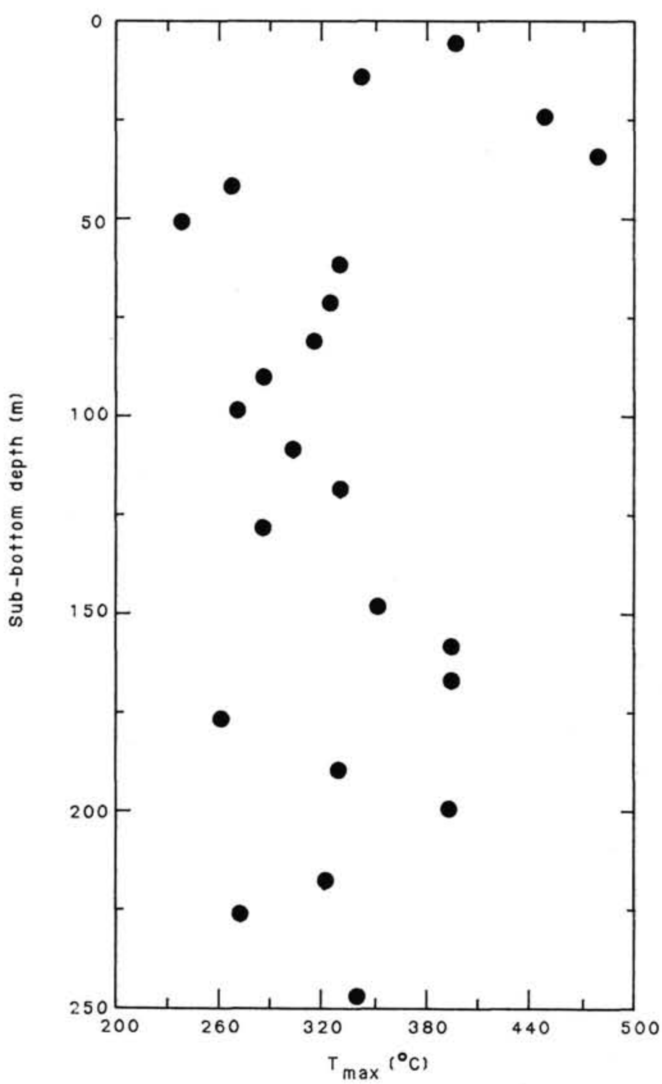


Figure 17. Downhole variation in T_{max}, Hole 630A. Note random T_{max} values, indicating mixed detrital sources.

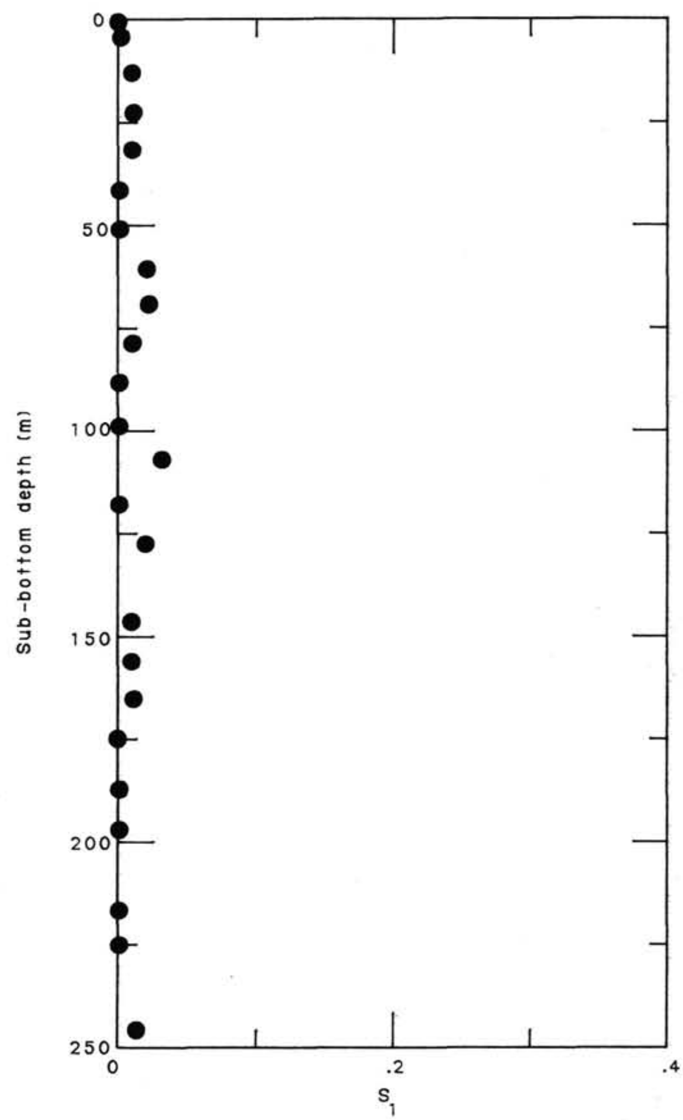


Figure 18. S_1 content (bitumen) downhole, Hole 630A, showing negligible bitumen content.

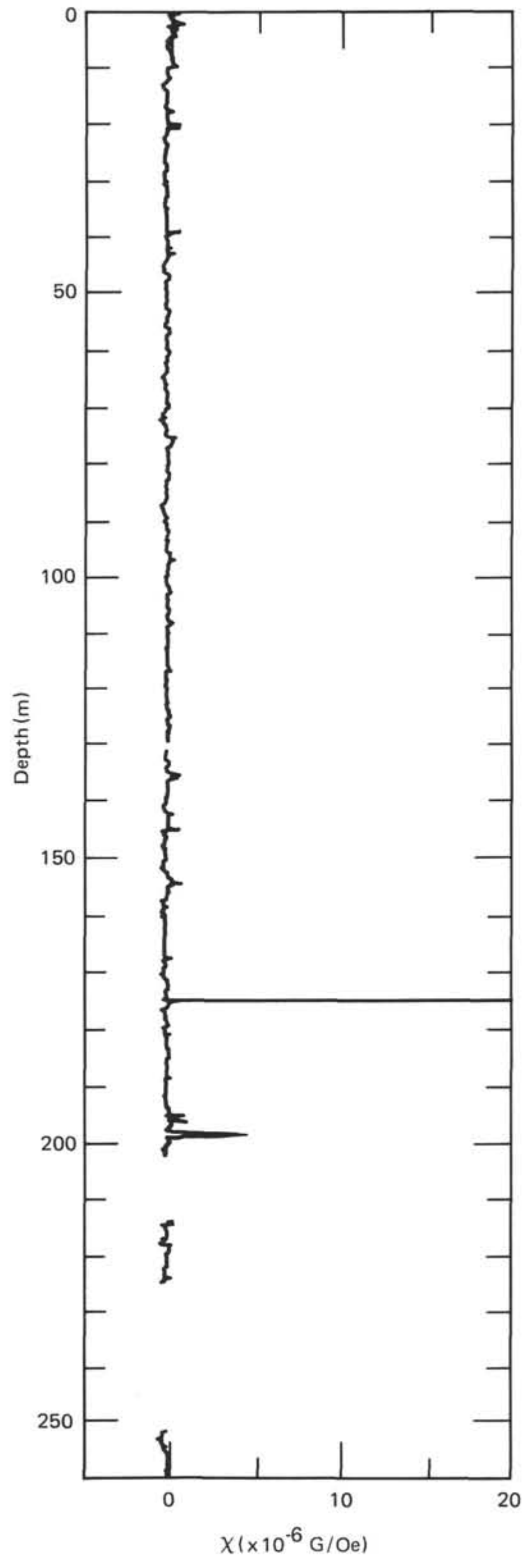


Figure 19. Magnetic-susceptibility values ($\times 10^{-6}$ G/Oe) plotted vs. sub-bottom depth in Hole 630A. Spikes related to rust contamination have been mostly eliminated by excluding Section 1 of each core from measurement.

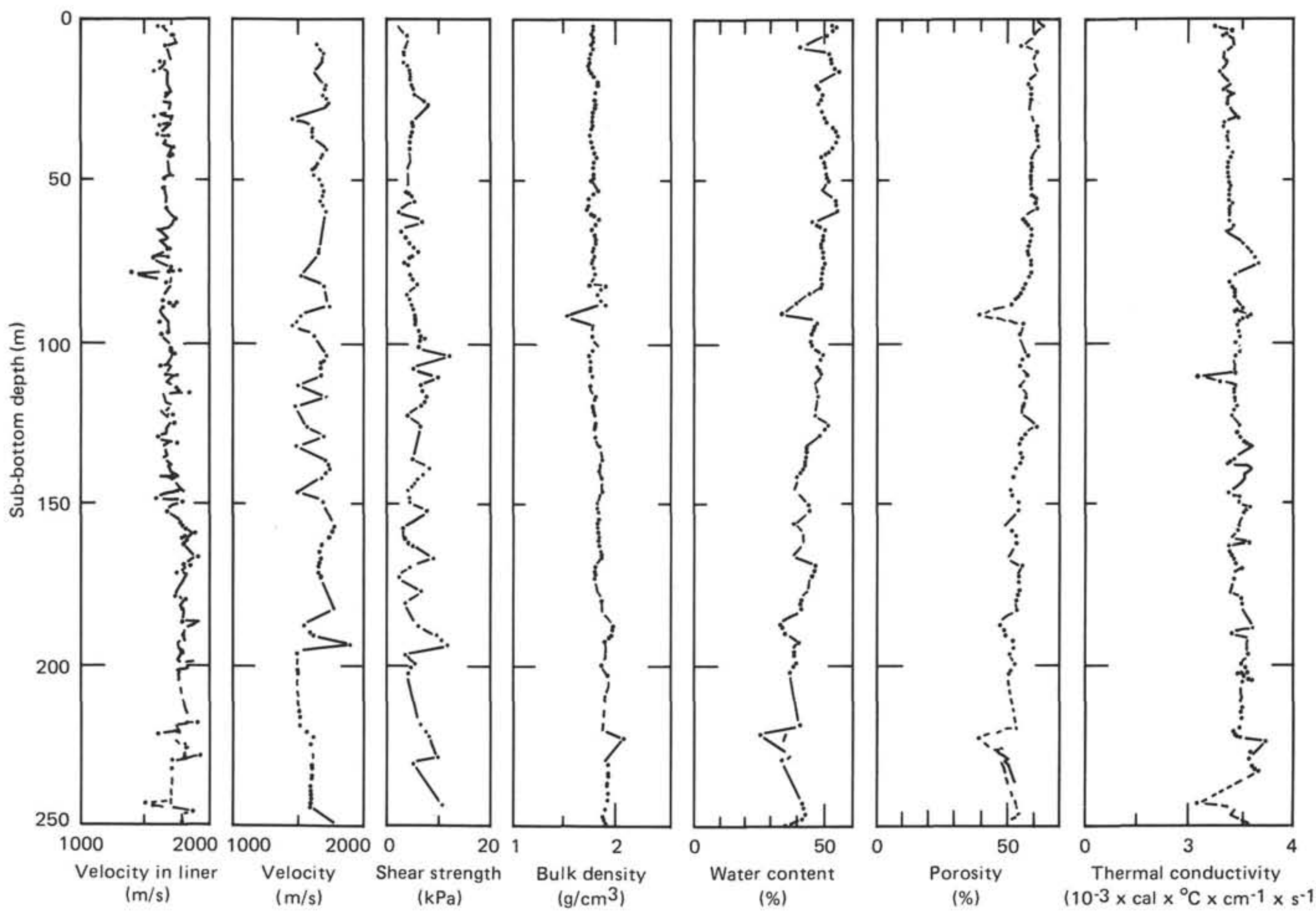


Figure 20. Graphic summary of the physical properties of Hole 630A. Density, water content, and porosity values were determined by gravimetric and volumetric techniques.

Table 11. Physical properties of sediments, Site 630.

Sample (level in cm)	Sub-bottom depth (m)	Velocity (m/s)	Velocity in liner (m/s)	Wet-bulk density (g/cm^3)	Dry water content (%)	Porosity (%)	Thermal conductivity ($10^{-3} \times cal \times {}^{\circ}C^{-1} \times cm^{-1} \times s^{-1}$)	Shear strength (kPa)
1-1, 20			1695					
1-2, 75	2.2			1.76	54.87	62.62	2.511	1.93
1-2, 100			1603					
1-3, 75	3.7						2.794	
1-4, 20			1713					
1-4, 70	5.2	1681	1696	1.76	50.48	59.10	2.647	3.62
1-4, 100			1714					
1-5, 75	6.7						2.853	
1-6, 20			1728					
1-6, 70	8.2	1655	1659	1.89	40.98	54.78	2.853	9.40
2-2, 20			1668					
2-2, 70	10.3	1696		1.78	51.77	60.91	2.655	2.94
2-3, 75	11.8						2.666	
2-4, 20			1691					
2-4, 70	13.3	1669	1614	1.74	53.35	60.41		3.51
2-4, 100			1649				2.703	
2-5, 75	14.8						2.682	
2-6, 20			1611					
2-6, 70	16.3	1635	1582	1.75	54.59	61.72	2.534	4.42
2-6, 100			1677					
3-2, 70	20.3	1722	1679	1.82	46.49	57.75		4.76
3-2, 100			1678				2.751	
3-3, 75	21.8						2.682	
3-4, 20			1687					
3-4, 70	23.3	1697	1667	1.79	48.72	58.88	2.866	5.44
3-4, 100			1679					
3-5, 75	24.8						2.692	
3-6, 20			1636					
3-6, 70	26.3	1732	1649	1.80	48.28	58.55	2.686	7.70
3-6, 100			1687					
4-2, 20			1656					
4-2, 70	30.3	1449	1579	1.76	50.08	58.81	2.888	4.76
4-2, 100			1709					
4-3, 75	31.8						2.643	
4-4, 20			1690					
4-4, 70	33.3	1622	1623	1.76	53.23	61.01	2.669	4.87
4-4, 100			1668					
4-5, 75	34.8						2.697	
4-6, 70	36.3	1625	1595	1.74	54.5	61.32	2.693	4.30
4-6, 100			1679					
5-2, 20			1635					
5-2, 70	39.7	1715	1724	1.77	52.82	61.30	2.704	4.08
5-2, 100			1707					
5-3, 75	41.2						2.795	
5-4, 20			1714					
4-4, 70	42.7	1680	1668	1.80	48.98	59.05	2.783	3.96
5-4, 100			1682					
5-5, 75	44.2						2.704	
5-6, 20			1670					
5-6, 70	45.7	1619	1678	1.77	49.98	58.94	2.688	3.85
5-6, 100			1678					
6-2, 20			1712					
6-2, 70	49.7	1667	1636	1.77	50.92	59.63		3.17
6-2, 100			1664					
6-3, 75	51.2						2.759	
6-4, 20			1656					
6-4, 70	52.7	1703	1635	1.82	48.56	59.27	2.762	3.62
6-4, 100			1635					
6-5, 75	54.2						2.763	
6-6, 20			1654					
6-6, 70	55.7	1675		1.75	53.7	61.13	2.756	5.44
6-6, 100			1666					
6-7, 15	56.6						2.794	
7-2, 20			1647					
7-2, 70	59.1	1714	1681	1.72	55.13	61.36	2.751	1.93
7-2, 100			1666					
7-3, 75	60.6						2.759	
7-4, 20			1736					
7-4, 70	62.1		1746	1.82	45.07	56.34	2.78	6.68
7-4, 100			1721					
7-5, 75	63.6						2.806	
7-6, 20			1676					
7-6, 70	65.1		1588	1.77	49.63	58.72	2.693	2.6
7-6, 100			1600					
8-2, 20			1669					
8-2, 70	68.6	1672	1646	1.79	49.37	59.27	2.994	4.19
8-2, 100			1626					
8-3, 75	70.1						3.141	
8-4, 20			1701					
8-4, 70	71.6	1655	1667	1.77	48.81	58.14	3.189	5.66
8-4, 100			1681					
8-5, 75	73.1						3.286	

Table 11 (continued).

Sample (level in cm)	Sub-bottom depth (m)	Velocity (m/s)	Velocity in liner (m/s)	Wet-bulk density (g/cm^3)	Dry water content (%)	Porosity (%)	Thermal conductivity (10^{-3} × cal × °C^{-1} × cm^{-1} × s^{-1})	Shear strength (kPa)
8-6, 20			1636					
8-6, 70	74.6		1673	1.77	50.20	59.08	3.318	3.17
8-6, 100			1562					
9-2, 20			1752					
9-2, 70	78.5	1508	1673	1.79	49.02	58.84	2.861	4.30
9-3, 75	80.0						2.749	
9-4, 20			1700					
9-4, 70	81.5	1700	1644	1.74	49.41	57.62	2.803	5.89
9-4, 100			1655					
9-5, 75	83.0						2.882	
9-6, 20			1697					
8-6, 70	84.5		1683	1.82	43.91	55.37	2.865	
9-6, 100			1717					3.62
10-2, 20			1641					
10-2, 70	87.9		1736	1.90	38.37	52.37	3.003	4.76
10-2, 100			1642					
10-3, 75	89.4						2.867	
10-4, 20			1612					
10-4, 70	90.9	1516	1491	1.51	35.37	39.17	3.091	4.98
10-5, 75	92.4						2.949	
10-6, 20			1645					
10-6, 70	93.9	1452	1609	1.76	46.48	55.74	2.919	5.10
10-6, 100			1679					
11-2, 20			1670					
11-2, 70	97.1	1623	1659	1.78	45.23	55.26	2.941	6.23
11-2, 100			1620					
11-3, 75	98.6						2.856	
11-4, 20			1645					
11-4, 70	100.1	1612	1681	1.81	44.81	55.95	2.970	5.66
11-5, 75	101.6						2.946	
11-6, 20			1703					
11-6, 70	103.1	1723	1723	1.74	48.8	57.03	2.875	11.78
11-6, 100			1715					
12-2, 20			1676					
12-2, 70	106.8	1676	1626	1.75	46.62	55.41	2.870	4.76
12-2, 100			1699					
12-3, 75	108.3						2.829	
12-4, 20			1654					
12-4, 70	109.8	1679	1729	1.78	48.68	58.25	2.117	9.17
12-4, 100			1663					
12-5, 75	111.3						2.581	
12-6, 20			1653					
12-6, 70	112.8	1486	1675	1.74	46.01	54.6	2.842	6.34
12-6, 100			1690					
13-2, 20			1833					
13-2, 70	116.1	1709	1643	1.8	46.44	56.96	2.843	7.53
13-2, 100			1643					
13-3, 75	117.6						2.842	
13-4, 20			1659					
13-4, 70	119.1	1466	1661	1.78	46.5	56.27	2.907	6.53
13-4, 100			1701					
13-5, 75	120.6						2.859	
13-6, 20			1659					
13-6, 70	122.1		1606	1.79	45.99	56.4	2.816	3.77
13-6, 100			1719					
14-2, 20			1709					
14-2, 70	125.7	1571	1673	1.8	51.6	61.25	2.934	6.28
14-2, 100			1638					
14-3, 75	127.2						2.895	
14-4, 20			1645					
14-4, 70	128.7	1704	1657	1.79	47.58	57.55	2.938	32.32
14-4, 100			1597					
14-5, 75	130.2						3.065	
14-6, 20			1739					
14-6, 70	131.7	1476	1644	1.84	43.05	55.08	3.210	
14-6, 100			1637					
15-2, 20			1662					
15-2, 70	135.6		1828	1.86	43.15	55.95	2.850	4.77
15-2, 100		1687	1630					
15-3, 75	137.1						2.763	
15-4, 20	138.6		1700					
15-4, 70		1729	1678	1.84	42.06	54.25	3.177	7.79
15-5, 75	140.1						3.053	
15-6, 20			1738					
15-6, 70	141.6	1678	1606	1.87	39.73	52.99	3.032	5.78
15-6, 100			1723					
16-2, 20			1759					
16-2, 70	145.4	1504	1735	1.86	39.16	52.17	2.773	3.77
16-2, 100			1791					
16-3, 75	146.9						2.980	
16-4, 20			1575					
16-4, 70	148.4	1706	1768	1.82	43.42	54.93	2.958	4.02

Table 11 (continued).

Sample (level in cm)	Sub-bottom depth (m)	Velocity (m/s)	Velocity in liner (m/s)	Wet-bulk density (g/cm^3)	Dry water content (%)	Porosity (%)	Thermal conductivity (10^{-3} × cal × °C^{-1} × cm^{-1} × s^{-1})	Shear strength (kPa)
16-5, 75	149.9						3.135	
16-6, 70	151.4		1683	1.82	43.63	55.24	3.046	7.53
16-6, 100			1652					
17-2, 20			1789					
17-2, 70	156.0	1788	1799	1.83	38.00	50.04	2.888	2.76
17-2, 100			1780					
17-3, 75	156.6						2.944	
17-4, 20			1874					
17-4, 70	158.0	1746	1833	1.85	41.59	54.29	2.811	3.01
17-4, 100			1788					
17-5, 75	159.5						3.136	
17-6, 20			1829					
17-6, 30	160.5	1668		1.84	41.93	54.26	2.756	4.78
17-6, 46			1803					
18-2, 20			1854					
18-2, 70	164.6	1681	2005	1.87	38.14	51.37	2.867	8.79
18-2, 100			1894					
18-3, 75	166.1						2.919	
18-4, 20			1791					
18-4, 70	167.6	1653	1834	1.79	46.02	56.31	3.014	4.27
18-4, 100			1841					
18-5, 75	169.1						2.848	
18-6, 20			1743					
18-6, 70	170.6	1669	1820	1.79	45	55.53	2.871	2.51
18-6, 100			1813					
19-2, 75	174.1			1.83	43.8	55.50	2.803	6.53
19-3, 75	175.6						3.024	
19-4, 20			1743					
19-4, 70	177.1		1796	1.87	40.66	53.74	2.994	3.01
19-4, 100			1769					
19-5, 75	179.6						3.097	
19-6, 20			1756					
19-6, 70	181.1	1768	1797	1.86	41.21	53.95	3.214	
19-6, 100			1774					
20-2, 20			1873					
20-2, 70	185.8	1548	1908	1.98	32.44	48.19	3.219	5.78
20-2, 100			1781					
20-3, 75	187.3						2.798	
20-4, 20			1804					
20-4, 70	188.8	1604	1791	1.95	34.47	49.69	3.107	9.54
20-5, 75	190.3						3.108	
20-6, 20			1805					
20-6, 70	191.7	1894	1745	1.89	39.65	53.44	3.013	11.05
21-2, 20			1775					
21-2, 70	195.7	1500	1764	1.90	38.06	52.02	3.100	3.01
21-2, 100			1778					
21-3, 75	197.2						2.998	
21-4, 20			1732					
21-4, 70	198.7	1495	1752	1.88	39.07	52.53	3.078	5.22
21-4, 100			1856					
21-5, 75	200.2						2.911	
21-6, 20			1809					
21-6, 70	201.7	1505	1744	1.91	37.18	51.39	3.033	3.77
21-6, 100			1749					
22-1, 50	211.8							
23-1, 75	213.3						2.979	
23-2, 20			1808	1.87	40.96	54.16		
23-2, 70	214.7	1512	1896				2.848	6.53
23-2, 100			1743					
23-3, 75	216.3						2.902	
23-3, 100	218.8	1620		2.06	24.49	40.10	3.464	
24-1, 75	222.6						3.162	
24-2, 20			1793					
24-2, 70	224.1		1923	1.90	36.94	51.02	2.959	9.79
24-2, 100			1803					
24-3, 20			1809					
24-3, 70	225.6		1802	1.93	33.76	48.49	3.260	4.77
24-3, 100			1685					
24-4, 20	227.1						3.305	
25-1, 15	231.5						2.147	
26-2, 20			1706					
26-2, 70	243.1	1596	1500	1.89	41.28	55.00	2.961	10.55
26-2, 100			1707					
26-3, 75	244.6						2.792	
26-4, 20			1867					
26-4, 70	246.1		1813	1.86	42.64	55.34	2.89	
26-4, 100			1766					
26-5, 75	247.6						3.081	
26-6, 20			1778					
26-6, 70	249.1	1820	1487	1.92	34.29	48.83	3.136	
26-6, 100			1970					

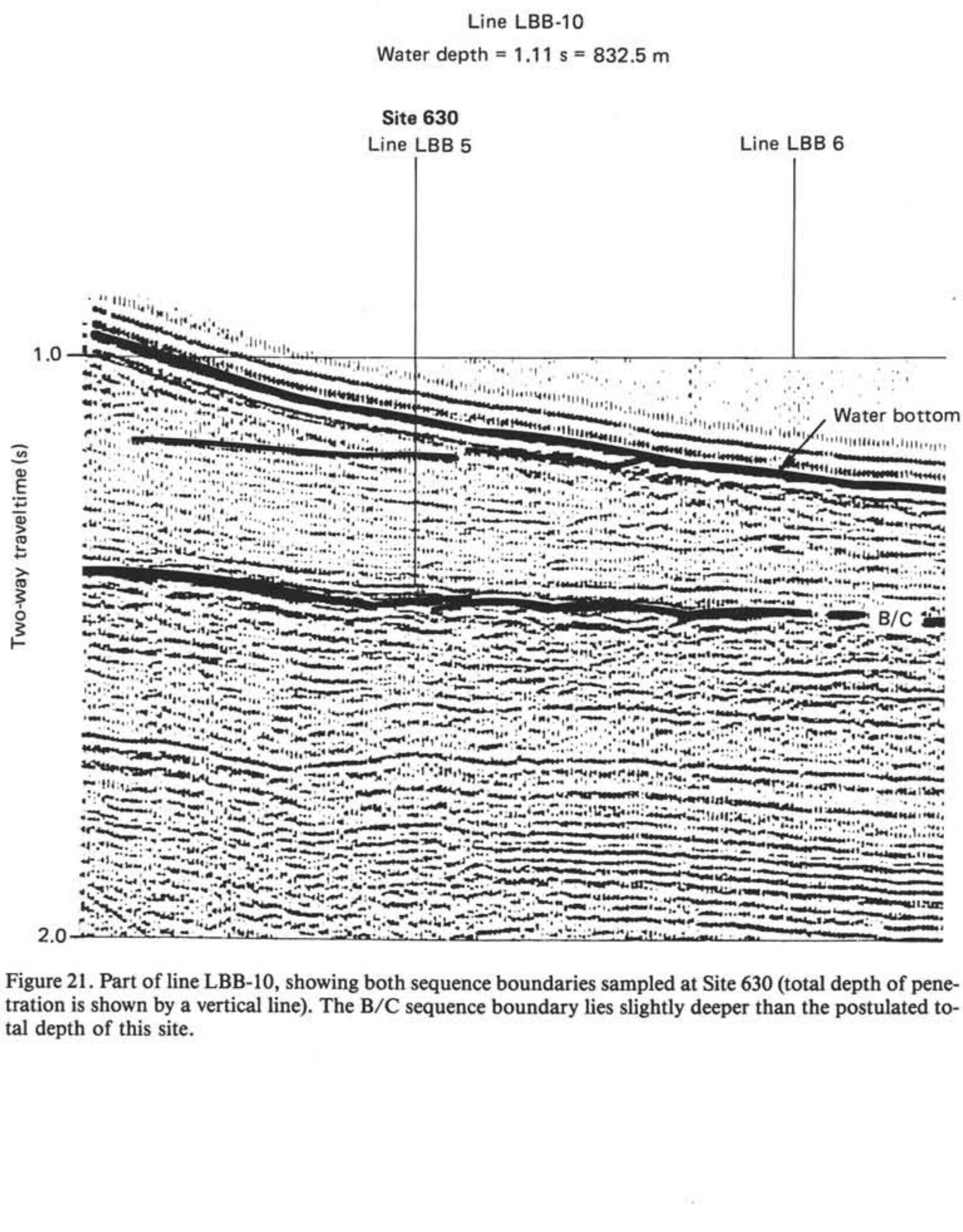


Figure 21. Part of line LBB-10, showing both sequence boundaries sampled at Site 630 (total depth of penetration is shown by a vertical line). The B/C sequence boundary lies slightly deeper than the postulated total depth of this site.

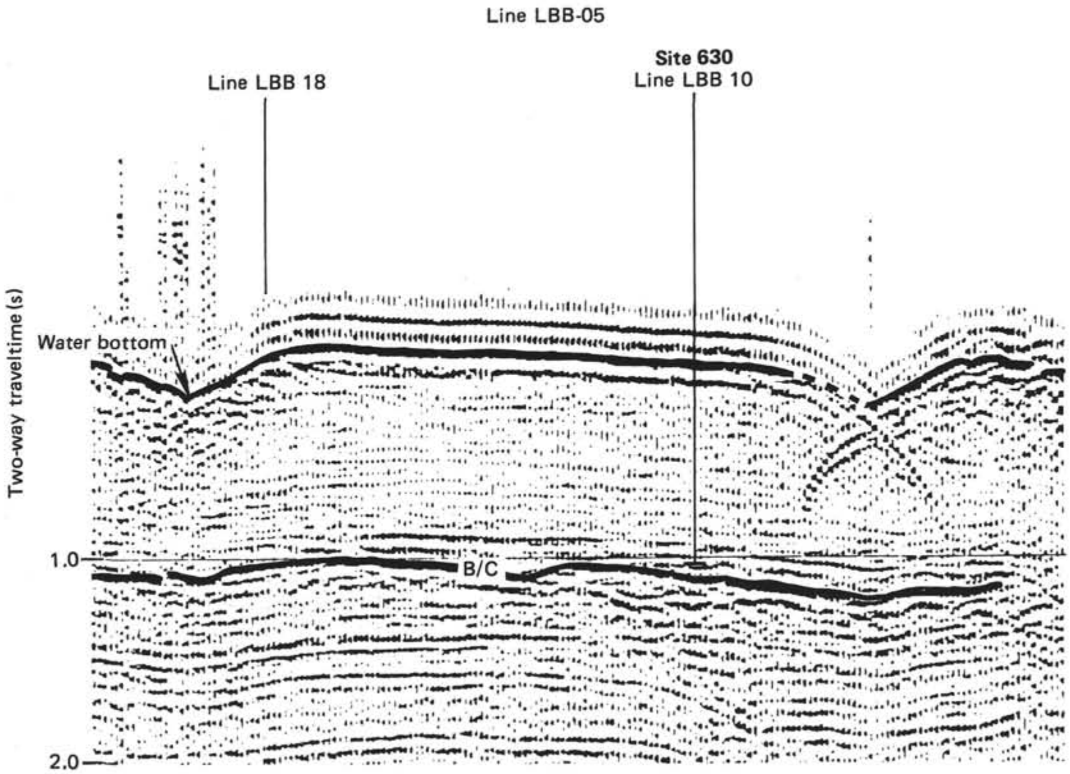


Figure 22. Part of line LBB-05, illustrating relief on the B/C sequence boundary between lines LBB-18 and LBB-10. Note that B/C lies slightly deeper than the total depth at Site 630.

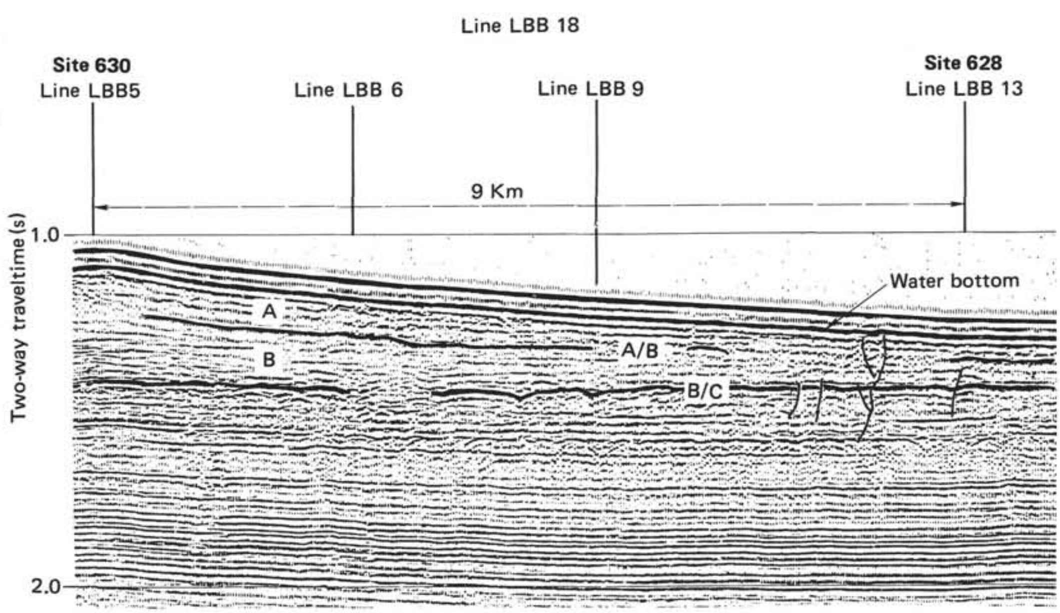


Figure 23. Part of line LBB-18, showing the lateral expression of the A/B and B/C sequence boundaries between Site 628 and survey line LBB-05. Only the B/C boundary can be carried with confidence.

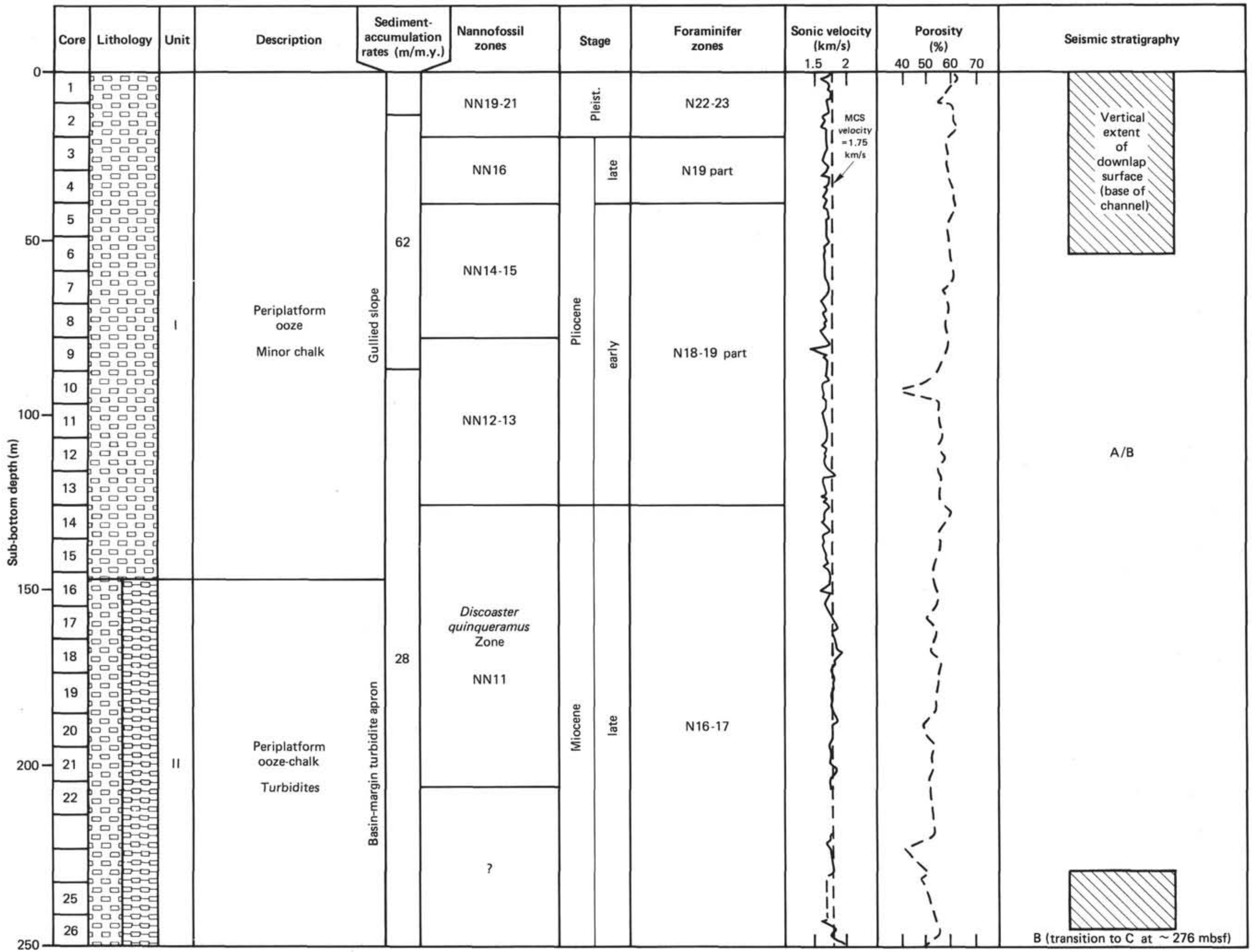


Figure 24. Summary of data for Site 630.

SITE 629 HOLE A CORE 1H CORED INTERVAL 552.5-559.4 mbsl; 0.0-6.9 mbsf

TIME-ROCK UNIT: LATE PLEISTOCENE - HOLOCENE

BIOSTRAT. ZONE / FOSSIL CHARACTER: FORAMINIFERS: *Globorotalia truncatulinoides* Zone (N23); NANNOFOSSILS: NN21

CHEMISTRY: 90% ●

SECTION: 1, 2, CC

METERS: 0.5, 1.0

GRAPHIC LITHOLOGY: VOID

LITHOLOGIC DESCRIPTION

UNLITHIFIED PACKSTONE, UNLITHIFIED FLOATSTONE, and UNLITHIFIED RUDSTONE with minor PARTIALLY LITHIFIED PACKSTONE

UNLITHIFIED PACKSTONE, white (5Y 8/1), occurs throughout core interbedded with other lithologies, both as the upper part of fining-upwards cycles and in alternations with PARTIALLY LITHIFIED PACKSTONE. PACKSTONE is coarse-grained, and contains foraminifers and skeletal fragments, including pteropods and echinoid spines.

UNLITHIFIED FLOATSTONE, white (10YR 8/2), occurs in Section 1, 18-102 cm, and Section 2, 15-30 cm. Grades up into RUDSTONE or PACKSTONE. Clast types include skeletal fragments and lithoclasts in a matrix of foraminifers and skeletal fragments.

UNLITHIFIED RUDSTONE, white (10YR 8/2) to pale yellow (2.5Y 7/4), occurs in Section 2, 30-40 cm, 50-72 cm, and 80-90 cm; contains clasts of LITHIFIED GRAINSTONE, 1-3 cm diameter.

PARTIALLY LITHIFIED PACKSTONE, white (10YR 8/2), occurs in Section 2, 40-50 cm and 93-126 cm, alternating with UNLITHIFIED PACKSTONE.

SMEAR SLIDE SUMMARY (%):

	1,75	2,140
	D	D
COMPOSITION:		
Quartz	Tr	–
Accessory Minerals	1	–
Foraminifers	10	30
Nannofossils	54	25
Pellets	10	–
Skeletal Fragments	20	–
Micrite	5	25
Clasts	–	20

SITE 629 HOLE A CORE 2H CORED INTERVAL 559.4-569.0 mbsl; 6.9-16.5 mbsf

TIME-ROCK UNIT: LATE PLEISTOCENE - HOLOCENE

BIOSTRAT. ZONE / FOSSIL CHARACTER: FORAMINIFERS: *Globorotalia truncatulinoides* Zone (N23); NANNOFOSSILS: NN21

CHEMISTRY: 92% ●

SECTION: 1, 2

METERS: 0.5, 1.0

LITHOLOGIC DESCRIPTION

UNLITHIFIED GRAINSTONE, UNLITHIFIED RUDSTONE, UNLITHIFIED PACKSTONE, with minor PARTIALLY LITHIFIED PACKSTONE to LITHIFIED PACKSTONE. No CC.

UNLITHIFIED GRAINSTONE, very pale brown (10YR 8/3), occurs in Section 1, 0-36 cm, 105-108 cm, and 124-127 cm; also in Section 2, 0-16 cm. The uppermost GRAINSTONE appears to be the upper part of a turbidite which fines upward from UNLITHIFIED RUDSTONE; grain types include pteropod casts, small lithoclasts, and a few benthic foraminifers.

UNLITHIFIED RUDSTONE, light gray (10YR 7/3), occurs in Section 1, 36-85 cm, as the basal part of a turbidite which fines to UNLITHIFIED GRAINSTONE. Clast size ranges up to 3 cm diameter; clasts include dolomite (with moldic porosity) and casts of large pteropods.

UNLITHIFIED PACKSTONE, white (10YR 8/2), in Section 1, 85-105 cm. Contains planktonic and benthic foraminifers and pteropods and lithoclasts.

PARTIALLY LITHIFIED to LITHIFIED PACKSTONE, white (10YR 8/2), occurs in Section 1, 130-150 cm.

SITE 629 HOLE A CORE 3X CORED INTERVAL 569.0-579.6 mbsl; 16.5-27.1mbsf

TIME-ROCK UNIT: LATE PLEISTOCENE

BIOSTRAT. ZONE / FOSSIL CHARACTER: FORAMINIFERS: *Globorotalia truncatulinoides* (N23)

SECTION: 1, CC

METERS: 0.5, 1.0

LITHOLOGIC DESCRIPTION

UNLITHIFIED PACKSTONE, UNLITHIFIED FLOATSTONE and UNLITHIFIED RUDSTONE, with minor PARTIALLY LITHIFIED PACKSTONE

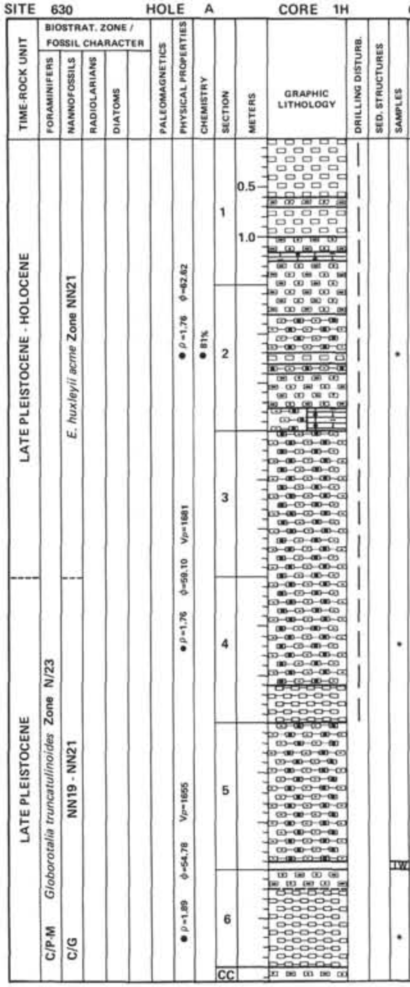
UNLITHIFIED PACKSTONE, white (5Y 8/1, 10YR 8/2) to pale yellow (2.5Y 7/4), occurs throughout core as upper part of fining-upwards sequence from FLOATSTONE or RUDSTONE. Foraminifers are predominant, with skeletal fragments and pteropods present.

UNLITHIFIED FLOATSTONE, white (5Y 8/1 to 10YR 8/2), occurs in Section 1, 8-15 cm and 23-30 cm, as the base of fining-upwards cycles; also occurs from 46 to 75 cm. Skeletal fragments are predominant in matrix, with lithoclasts and pteropods present.

UNLITHIFIED RUDSTONE, white (10YR 8/2) mixed with pale yellow (2.5Y 8/4), occurs in CC, 21-32 cm; contains CHALK clasts.

PARTIALLY LITHIFIED PACKSTONE, white (10YR 8/2), is possibly a clast. Occurs in Section 1,42-46 cm.

SITE 630 HOLE A CORE 1H CORED INTERVAL 804.5-813.1 mbsl; 0-8.6 mbsf



LITHOLOGIC DESCRIPTION

PARTIALLY LITHIFIED PACKSTONE, UNLITHIFIED PACKSTONE, CHALK and CALCAREOUS OOZE, with minor PARTIALLY LITHIFIED PACKSTONE and LITHIFIED PACKSTONE

PARTIALLY LITHIFIED PACKSTONE, white (whiter than 10YR 8/1 to 10YR 8/1), occurs in Section 2, 38-73 cm and 77-79 cm; from Section 3, 0 cm, through Section 4, 109 cm; and in Section 5, 0-150 cm. Contains foraminifers, grain aggregates (< 0.2 cm diameter), clay and nannofossils; slightly burrowed.

UNLITHIFIED PACKSTONE, white (10YR 8/2, 10YR 8/1), occurs from Section 1, 125 cm, through Section 2, 38 cm; in Section 2, 88-127 cm; in Section 6, 0-20 cm, and in the CC. PACKSTONE contains bioclasts, foraminifers, and grain aggregates (up to 0.3 cm diameter).

CHALK, white (10YR 8/2), occurs in Section 4, 109-150 cm, and in Section 6, 20-100 cm.

CALCAREOUS OOZE, very pale brown (10YR 7/3) to white (2.5Y 8/0, 10YR 8/1), occurs in Section 1, 0-63 cm, with a thin UNLITHIFIED PACKSTONE interbed, contains pteropods. Also in Section 2, 73-77 cm.

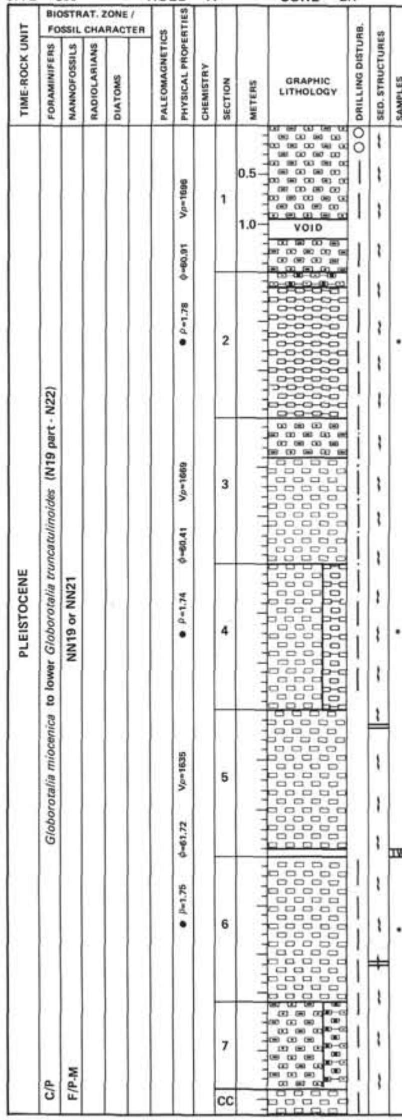
PARTIALLY LITHIFIED to LITHIFIED PACKSTONE, white (10YR 8/1), occurs in Section 2, 127-150 cm.

LITHIFIED PACKSTONE, white (10YR 8/1), occurs in Section 1, 115-125 cm.

SMEAR SLIDE SUMMARY (%):

	2,70 D	4,75 D	6,75 D
COMPOSITION:			
Foraminifers	10	10	10
Nannofossils	10	10	20
Skeletal Fragments	20	15	15
Clasts	10	5	5
Micrite	50	60	50
Pteropods	–	–	Tr

SITE 630 HOLE A CORE 2H CORED INTERVAL 813.1-822.7 mbsl; 8.6-18.2 mbsf



LITHOLOGIC DESCRIPTION

CALCAREOUS OOZE, CHALK, and UNLITHIFIED PACKSTONE, with minor UNLITHIFIED to PARTIALLY LITHIFIED PACKSTONE and MARLY CALCAREOUS OOZE

CALCAREOUS OOZE, white (10YR 8/1), occurs from Section 3, 40 cm, through Section 6, 150 cm; grades toward CHALK in Section 4, 0-150 cm. OOZE in CC is light gray to gray (5Y 7/1 to 5Y 5/1). Contains burrows 1-2 cm diameter; some with dark clayey centers.

CHALK, white (10YR 8/1), occurs in Section 2, 16-150 cm.

UNLITHIFIED PACKSTONE, white (10YR 8/1), occurs in Section 1, 0-150 cm (with a void from 96-114 cm), and Section 3, 0-40 cm. PACKSTONE is bioturbated; burrows are light gray (2.5Y 7/0).

UNLITHIFIED to PARTIALLY LITHIFIED PACKSTONE, white (10YR 8/1 to 5Y 8/1), fine to very fine-grained, contains foraminifers. Pyrite occurs in gray streaks and specks, and in burrow fills.

MARLY CALCAREOUS OOZE, light gray to gray (5Y 7/1 to 5Y 5/1), *occurs in the CC. Small burrows are present (0.2 cm diameter).*

SMEAR SLIDE SUMMARY (%):

	2,75 D	4,75 D	6,75 D	CC,18 M
COMPOSITION:				
Quartz	–	–	–	Tr
Accessory Minerals:				
Pyrite	–	–	–	5
Foraminifers	10	10	10	5
Nannofossils	20	25	13	10
Sponge Spicules	–	–	2	–
Pteropods	Tr	Tr	–	–
Skeletal Fragments	20	20	30	20
Clasts	10	5	10	–
Micrite	40	40	35	60

SITE 630 HOLE A CORE 3H CORED INTERVAL 822.7-832.3 mbsl; 18.2-27.8 mbsf

TIME-ROCK UNIT: LATE PLIOCENE

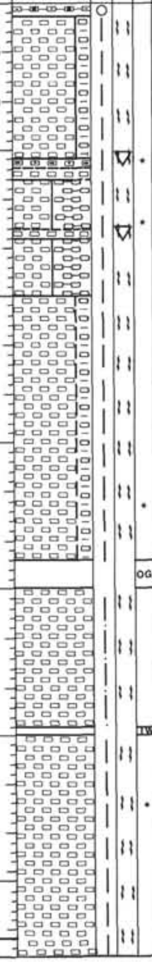
BIOSTRAT. ZONE / FOSSIL CHARACTER: FORAMINIFERS: *Globorotalia miocenica* Zone (N19 part) /M; NANNOFOSSILS: NN16 C/M

PHYSICAL PROPERTIES: Vp=1722; ϕ=57.75; ● ρ=1.82; Vp=1697; ϕ=58.88; ● ρ=1.79; Vp=1732; ϕ=58.55; ● ρ=1.80

SECTION: 1, 2, 3, 4, 5, 6, CC

METERS: 0.5, 1.0

SAMPLES: OG, IW



LITHOLOGIC DESCRIPTION

CALCAREOUS OOZE and CHALKY CALCAREOUS OOZE, with minor MARLY OOZE, UNLITHIFIED PACKSTONE and PARTIALLY LITHIFIED PACKSTONE

CALCAREOUS OOZE, white (5Y 8/1 and 10YR 8/1), from Section 3, 0 cm, through the base of the core; mottled and bioturbated.

CHALK, white (5Y 8/1), from Section 1, 14 cm, through Section 4, 120 cm, with other minor lithologies interbedded. Bioturbated; contains grains (grain aggregates and foraminifers) and micrite.

OOZE, olive gray (5Y 6/2) to light gray (5Y 7/1), occurs in Section 2, 12-30 cm and 79-92 cm. OOZE grades upwards into less muddy intervals. Bioturbation occurred after deposition of the OOZE, because burrows extend through these intervals.

UNLITHIFIED PACKSTONE, light gray (5Y 7/2), occurs in Section 2, 9-12 cm.

PARTIALLY LITHIFIED PACKSTONE, white (5Y 8/1), occurs in Section 1, 0-14 cm; possibly deformed by drilling.

SMEAR SLIDE SUMMARY (%):

	2,27 D	2,75 M	4,75 D	6,75 D
COMPOSITION:				
Quartz	–	2	–	–
Clay	–	20	–	–
Dolomite	–	1	–	–
Palagonite	–	Tr	–	–
Foraminifers	5	–	5	5
Nannofossils	10	45	15	40
Sponge Spicules	Tr	–	Tr	–
Skeletal Fragments	25	7	20	10
Clasts	10	–	5	–
Micrite	50	25	50	40
Pellets	–	–	5	5

SITE 630 HOLE A CORE 4H CORED INTERVAL 832.3-841.9 mbsl; 27.8-37.4 mbsf

TIME-ROCK UNIT: LATE PLIOCENE

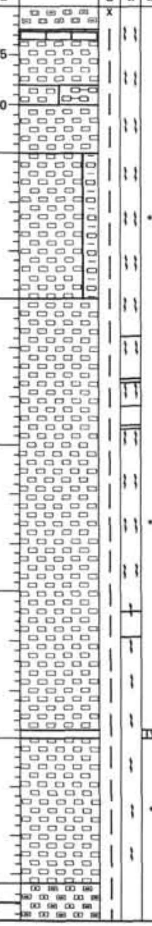
BIOSTRAT. ZONE / FOSSIL CHARACTER: FORAMINIFERS: *Globorotalia miocenica* Zone (N19 part) A/P-M; NANNOFOSSILS: NN16

PHYSICAL PROPERTIES: Vp=1709; ϕ=58.81; ● ρ=1.76; Vp=1622; ϕ=61.01; ● ρ=1.76; Vp=1625; ϕ=61.32; ● ρ=1.74

SECTION: 1, 2, 3, 4, 5, 6, 7, CC

METERS: 0.5, 1.0

SAMPLES: IW



LITHOLOGIC DESCRIPTION

CALCAREOUS OOZE and CHALK with minor UNLITHIFIED PACKSTONE, LIMESTONE (LITHIFIED OOZE), and UNLITHIFIED FLOATSTONE (probably is drilling breccia)

CALCAREOUS OOZE, white (10YR 8/1), occurs in Section 1, 30-85 cm and 100-150 cm; also in Section 3, 0 cm, through Section 6, 150 cm. Bioturbated, with brownish to gray mottles. Contains some medium to coarse grains, including foraminifers and grain aggregates.

CHALK, white (10YR 8/1), occurs in Section 1, 85-100 cm, and in Section 2, 0-150 cm. Bioturbated, contains grain aggregates and foraminifers.

LIMESTONE (LITHIFIED OOZE), white (10YR 8/1), occurs as a single layer in Section 1, 25-30 cm.

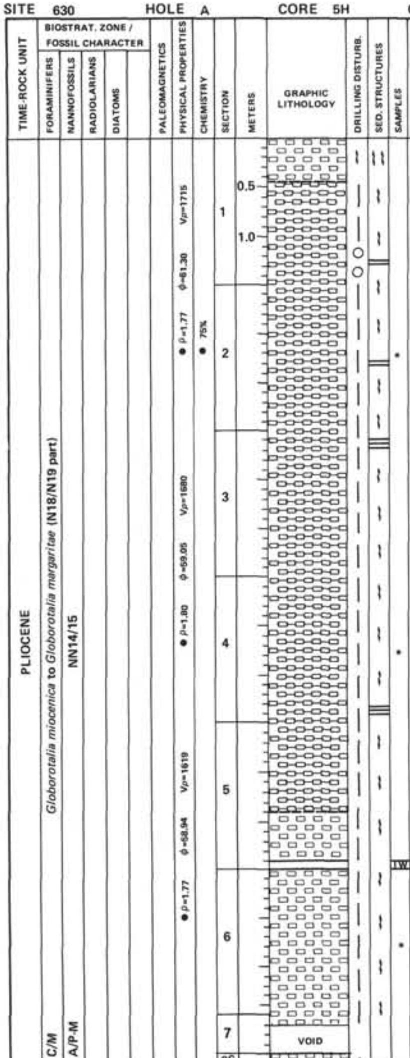
UNLITHIFIED PACKSTONE, white (5Y 8/1), occurs in Section 7 and the CC. Contains coarse grains (up to 0.3 cm diameter), including skeletal grains.

UNLITHIFIED FLOATSTONE, white (10YR 8/1), probably drilling breccia, in Section 1, 0-25 cm.

SMEAR SLIDE SUMMARY (%):

	2,75 D	4,75 D	6,75 D
COMPOSITION:			
Foraminifers	10	15	10
Nannofossils	50	40	35
Skeletal Fragments	15	15	20
Clasts	5	–	5
Micrite	20	30	30

SITE 630 HOLE A CORE 5H CORED INTERVAL 841.9-851.5 mbsl; 37.4-47.0 mbsf



LITHOLOGIC DESCRIPTION

CHALK and CALCAREOUS OOZE

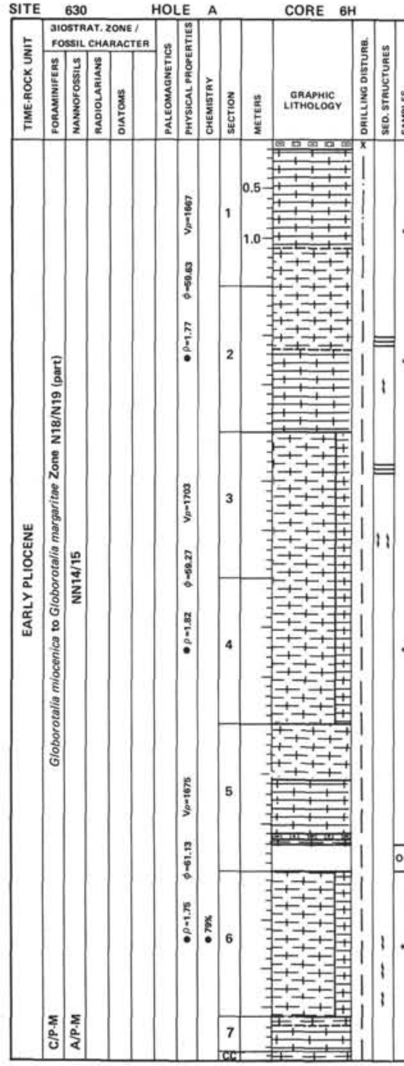
CHALK, white (10YR 8/1), occurs from Section 1, 45 cm, through Section 5, 85 cm. Purplish-gray bands and subvertical streaks, and brown mottles are present.

CALCAREOUS OOZE, white (10YR 8/1), occurs in Section 1, 0-45 cm, and from Section 5 through the base of the core. Contains some coarse sand, fine sand and silt; burrowed.

SMEAR SLIDE SUMMARY (%):

	2,75 D	4,75 D	6,75 D
COMPOSITION:			
Foraminifers	10	15	20
Nannofossils	50	40	45
Skeletal Fragments	15	15	10
Micrite	25	25	25
Clasts	–	5	–

SITE 630 HOLE A CORE 6H CORED INTERVAL 851.5-861.4 mbsl; 47.0-56.9 mbsf



LITHOLOGIC DESCRIPTION

FORAM-NANNOFOSSIL OOZE and FORAM-NANNOFOSSIL CHALK, with minor UNLITHIFIED PACKSTONE and UNLITHIFIED FLOATSTONE (probably is drilling breccia)

FORAM-NANNOFOSSIL OOZE, white (10YR 8/1), occurs from Section 1, 111 cm, through Section 2, 65 cm, Section 5, 0-56 cm, Section 7, 0-6 cm, and in the CC.

FORAM-NANNOFOSSIL OOZE, interbedded with FORAM-NANNOFOSSIL CHALK, white (10YR 8/1), occurs from Section 3, 0 cm, through Section 4, 150 cm; also from Section 5, 114 cm, through Section 6, 150 cm. *Medium to coarse grains, pyritic* burrows, and horizontal beds are present.

CHALK, white (10YR 8/1), occurs in Section 1, 10-111 cm, in Section 2, 65-150 cm; also in Section 5, 56-110 cm, and Section 7, 6-33 cm. Gray and purple streaks present.

UNLITHIFIED PACKSTONE, white (10YR 8/1), occurs in Section 5, 110-114 cm.

UNLITHIFIED FLOATSTONE, white (10YR 8/1), occurs in Section 1, 1-10 cm; probably drilling breccia.

SMEAR SLIDE SUMMARY (%):

	1,85 D	2,75 D	4,75 D	6,75 D
COMPOSITION:				
Dolomite	Tr	–	–	–
Foraminifers	10	10	10	10
Nannofossils	60	45	60	60
Skeletal Fragments	10	15	15	15
Micrite	20	25	25	25
Clasts	–	5	–	–
Pteropods	–	–	Tr	–

SITE 630 HOLE A CORE 7H CORED INTERVAL 861.4-870.8 mbsl; 56.9-66.3 mbsf

TIME-ROCK UNIT: EARLY PLIOCENE

BIOSTRAT. ZONE / FOSSIL CHARACTER: Foraminifers: *Globorotalia margaritae* Zone (N18/N19 part), C/M; Nannofossils: NN14/15, C/P

PHYSICAL PROPERTIES: Vp=1714; φ=61.36; ● ρ=1.72; Vp=1721; φ=56.34; ● ρ=1.82; Vp=1600; φ=58.72; ● ρ=1.77

CHEMISTRY: ● (Section 2); ● 78% (Section 6)

SECTION: 1, 2, 3, 4, 5, 6, 7, CC

METERS: 0.5, 1.0

SAMPLES: IW

LITHOLOGIC DESCRIPTION

FORAM-NANNOFOSSIL CHALK and minor UNLITHIFIED FLOATSTONE (probably is drilling breccia)

FORAM-NANNOFOSSIL CHALK, white (7.5YR 8/0, 10YR 8/1, and 5Y 8/1), occurs from Section 1, 15 cm, through the base of the core. Contains purple/gray streaks, horizontal beds, and light brown mottles.

UNLITHIFIED FLOATSTONE, white (7.5YR 8/0), in Section 1, 0-15 cm; probably drilling breccia.

SMEAR SLIDE SUMMARY (%)

	2,75	4,75	6,75
COMPOSITION:			
Foraminifers	10	15	10
Nannofossils	60	55	60
Pteropods	–	Tr	–
Skeletal Fragments	10	10	10
Micrite	20	20	20

SITE 630 HOLE A CORE 8H CORED INTERVAL 870.8-880.4 mbsl; 66.3-75.9 mbsf

TIME-ROCK UNIT: EARLY PLIOCENE - LATEST MIOCENE

BIOSTRAT. ZONE / FOSSIL CHARACTER: Foraminifers: *Globorotalia margaritae* Zone (N18/N19 part), C/M; Nannofossils: NN14/15, A/M

PHYSICAL PROPERTIES: Vp=1672; φ=58.27; ● ρ=1.79; Vp=1605; φ=58.14; ● ρ=1.77; Vp=1636; φ=59.08; ● ρ=1.77

CHEMISTRY: ● 81% (Section 4)

SECTION: 1, 2, 3, 4, 5, 6, 7, CC

METERS: 0.5, 1.0

LITHOLOGIC DESCRIPTION

CALCAREOUS OOZE, and FORAM-NANNOFOSSIL CHALK, with minor UNLITHIFIED, UNLITHIFIED to PARTIALLY LITHIFIED, and PARTIALLY LITHIFIED PACKSTONE, LIMESTONE (LITHIFIED OOZE), and UNLITHIFIED FLOATSTONE (probably drilling breccia)

CALCAREOUS OOZE, white (10YR 8/1), occurs throughout the core. Contains some foraminifers and grain aggregates.

CHALK, white (10YR 8/1), occurs as a thin layer in Section 1, 113-130 cm; also occurs from Section 1, 146 cm, through Section 2, 86 cm and 136-150 cm. Contains vertical purple/gray streaks and brown mottles.

UNLITHIFIED PACKSTONE, white (10YR 8/2 and 2.5YR 8/2), occurs in Section 2, 76-120 cm, in Section 3, 25-32 cm and 108-112 cm, in Section 4, 140-150 cm, and from Section 5, 135 cm, to Section 5, 5 cm. UNLITHIFIED to PARTIALLY LITHIFIED PACKSTONE, white (10YR 8/1), occurs in Section 3, 0-25 cm. PARTIALLY LITHIFIED PACKSTONE, white (10YR 8/2), in Section 2, 125-135 cm. PACKSTONES contain fine sand and have sharp bases and gradational tops.

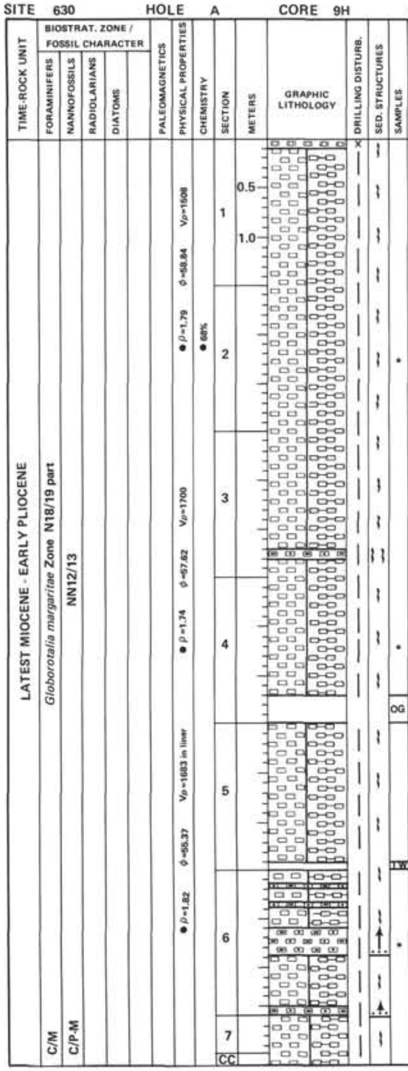
LIMESTONE (LITHIFIED OOZE), white (10YR 8/1), occurs in Section 1, 10-14 cm and 63-70 cm.

UNLITHIFIED FLOATSTONE, white (10YR 8/1), occurs in Section 1, 0-10 cm; probably drilling breccia.

SMEAR SLIDE SUMMARY (%):

	2,75 D	2,115 D	4,75 D	6,75 D
COMPOSITION:				
Foraminifers	20	30	15	10
Nannofossils	30	25	60	50
Pteropods	Tr	–	Tr	–
Skeletal Fragments	20	20	5	15
Clasts	5	5	–	–
Micrite	25	20	20	25

SITE 630 HOLE A CORE 9H CORED INTERVAL 880.4-890.2 mbsl; 75.9-85.7 mbsf



LITHOLOGIC DESCRIPTION

CALCAREOUS OOZE and CHALK, UNLITHIFIED PACKSTONE, and UNLITHIFIED RUDSTONE (probably drilling breccia)

CALCAREOUS OOZE and CHALK, white (10YR 8/1), occurs interbedded throughout core, interbedded with thin UNLITHIFIED PACKSTONE units. *OOZE contains pyrite streaks and flecks.*

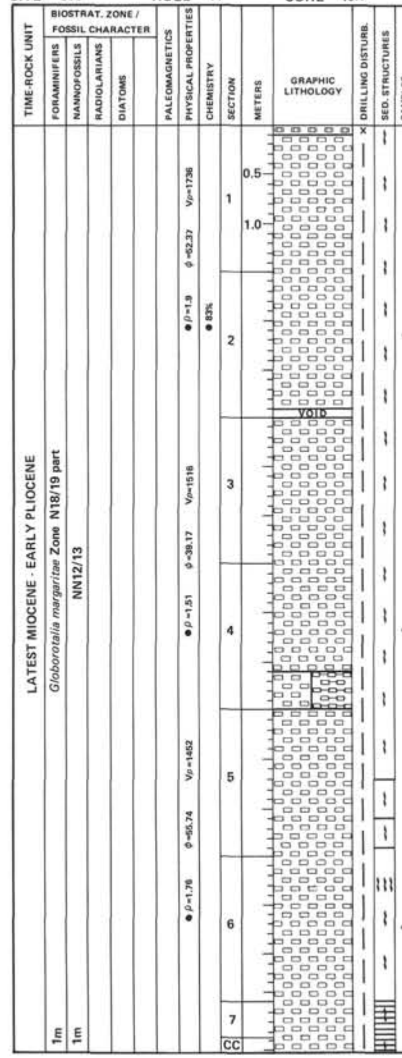
UNLITHIFIED PACKSTONE, white (10YR 8/1), occurs mostly as thin (2-3 cm thickness) beds, although a thicker graded unit occurs in Section 6, 60-88 cm.

UNLITHIFIED RUDSTONE, white (10YR 8/1), occurs in Section 1, 0-10 cm; probably drilling breccia.

SMEAR SLIDE SUMMARY (%):

	2,75 D	4,75 D	6,75 D
COMPOSITION:			
Foraminifers	15	10	10
Nannofossils	35	40	40
Clasts	20	20	15
Micrite	30	30	35

SITE 630 HOLE A CORE 10H CORED INTERVAL 890.2-899.6 mbsl; 85.7-95.1 mbsf



LITHOLOGIC DESCRIPTION

CALCAREOUS OOZE, with minor CHALK and UNLITHIFIED RUD-STONE (probably is drilling breccia). Section 3 is actually 160 cm long.

CALCAREOUS OOZE, white (10YR 8/1), occurs throughout core with a partially indurated interval in Section 4, 110-150 cm (CHALK). Contains pyrite flecks and burrows, and more grains than Core 9H. A glauconitic burrow is present in Section 6, 137-138 cm; horizontal laminae occur in Section 7.

UNLITHIFIED RUDSTONE, white (10YR 8/1), occurs in Section 1, 0-10 cm; probably drilling breccia.

SMEAR SLIDE SUMMARY (%):

	2,75 D	4,75 D	6,75 D
COMPOSITION:			
Quartz	Tr	–	–
Foraminifers	25	30	30
Nannofossils	35	35	40
Skeletal Fragments	5	10	15
Micrite	30	25	15
Clasts	15	–	–

SITE 630 HOLE A CORE 11H CORED INTERVAL 899.6-909.2 mbsl; 95.1-104.7 mbsf

TIME-ROCK UNIT: LATEST MIOCENE - EARLY PLIOCENE

BIOSTRAT. ZONE / FOSSIL CHARACTER:
- FORAMINIFERS: *Globorotalia margaritae* Zone N18/19 part; C/P-M
- NANNOFOSSILS: NN12/13; C/P-M
- RADIOLARIANS
- DIATOMS

PALEOMAGNETICS

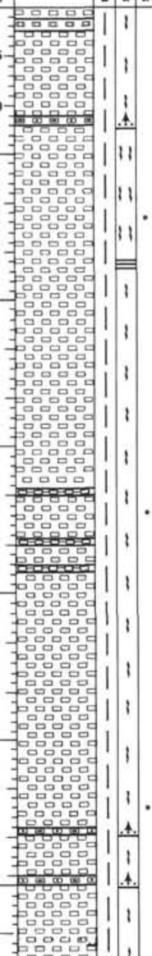
PHYSICAL PROPERTIES: Section 1: Vp=1620, ϕ=55.26, ● ρ=1.78; Section 3: Vp=1612, ϕ=55.95, ● ρ=1.81; Section 5: Vp=1723, ϕ=57.03, ● ρ=1.74

CHEMISTRY: ● 80%; ● 77%; ● 74%

SECTION: 1, 2, 3, 4, 5, 6, 7, CC

METERS: 0.5, 1.0

GRAPHIC LITHOLOGY / DRILLING DISTURB. / SED. STRUCTURES / SAMPLES



LITHOLOGIC DESCRIPTION

CALCAREOUS OOZE with minor CHALK, UNLITHIFIED PACKSTONE, and UNLITHIFIED RUDSTONE

CALCAREOUS OOZE, white (10YR 8/1), throughout core, with minor lithologies interbedded. OOZE contains grains, including some very grainy intervals; grains are predominantly foraminifers; glauconite also occurs as blebs and layers.

CHALK, white (10YR 8/1), occurs as thin beds in Section 4, 49-53 cm, 96-100 cm and 122-126 cm.

UNLITHIFIED PACKSTONE, white (10YR 8/1), occurs in beds in Section 1, 111-121 cm, and Section 6, 90-96 cm and 139-150 cm.

UNLITHIFIED RUDSTONE, white (10YR 8/1), occurs in Section 1, 13-24 cm.

SMEAR SLIDE SUMMARY (%):

	2,75 D	4,75 D	6,75 D
COMPOSITION:			
Quartz	Tr	–	–
Feldspar	Tr	–	–
Foraminifers	35	20	25
Nannofossils	40	40	35
Sponge Spicules	Tr	5	5
Skeletal Fragments	5	–	10
Micrite	20	20	15
Clasts	–	15	10

SITE 630 HOLE A CORE 12H CORED INTERVAL 909.2-918.8 mbsl; 104.7-114.3 mbsf

TIME-ROCK UNIT: LATEST MIOCENE - EARLY PLIOCENE

BIOSTRAT. ZONE / FOSSIL CHARACTER:
- FORAMINIFERS: *Globorotalia margaritae* Zone (N18/19 part); C/M
- NANNOFOSSILS: NN12/13; C/P
- RADIOLARIANS
- DIATOMS

PALEOMAGNETICS

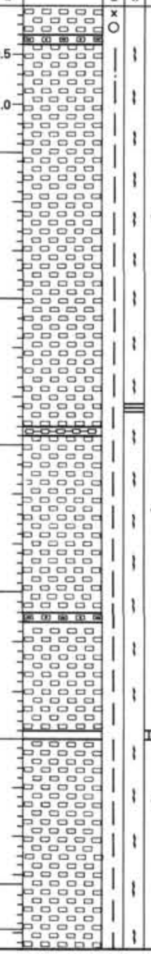
PHYSICAL PROPERTIES: Section 1: Vp=1676, ϕ=55.41, ● ρ=1.75; Section 3: Vp=1679, ϕ=58.25, ● ρ=1.78; Section 5: Vp=1690, ϕ=54.60, ● ρ=1.74

CHEMISTRY: ● 76%

SECTION: 1, 2, 3, 4, 5, 6, 7, CC

METERS: 0.5, 1.0

GRAPHIC LITHOLOGY / DRILLING DISTURB. / SED. STRUCTURES / SAMPLES



LITHOLOGIC DESCRIPTION

CALCAREOUS OOZE, with minor UNLITHIFIED PACKSTONE and CHALK

CALCAREOUS OOZE, white (10YR 8/1, 5Y 8/1), throughout core, with minor lithologies interbedded. OOZE is less grainy than overlying cores. Bioturbated, except for a horizontally laminated interval in Section 3, 115-128 cm.

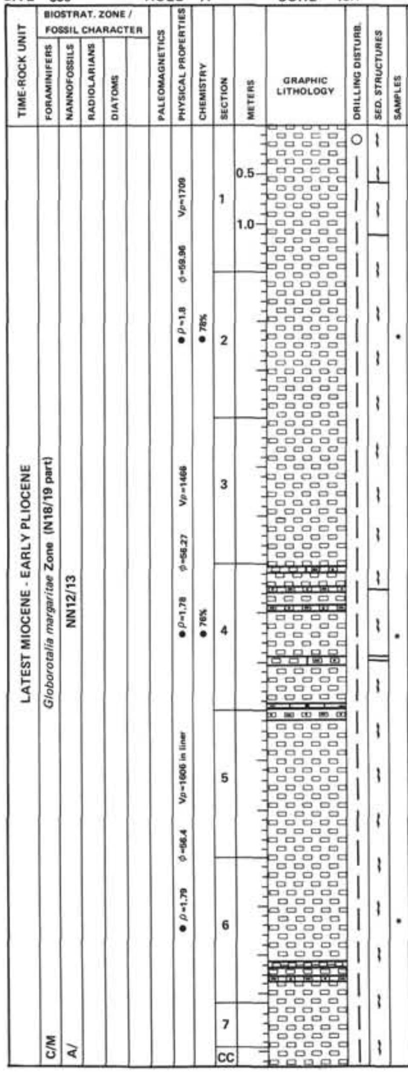
UNLITHIFIED PACKSTONE, white (10YR 8/1), occurs in Section 1, 31-36 cm, and in Section 5, 21-24 cm.

CHALK, white (10YR 8/1), occurs in Section 3, 135-139 cm.

SMEAR SLIDE SUMMARY (%):

	2,75 D	4,75 D	6,75 D
COMPOSITION:			
Accessory Minerals	Tr	–	–
Foraminifers	30	35	35
Nannofossils	35	25	35
Sponge Spicules	10	5	10
Skeletal Fragments	10	5	–
Micrite	15	20	20
Clasts	–	10	10

SITE 630 HOLE A CORE 13H CORED INTERVAL 918.8-928.4 mbsl; 114.3-123.9 mbsf



LITHOLOGIC DESCRIPTION

CALCAREOUS OOZE, with minor UNLITHIFIED and LITHIFIED PACKSTONE and CHALK

CALCAREOUS OOZE, white (10YR 8/1), *throughout core, with* minor lithologies interbedded. Contains glauconite and pyrite mottles and occasional laminations. Bioturbated, with some burrows filled with fine sand.

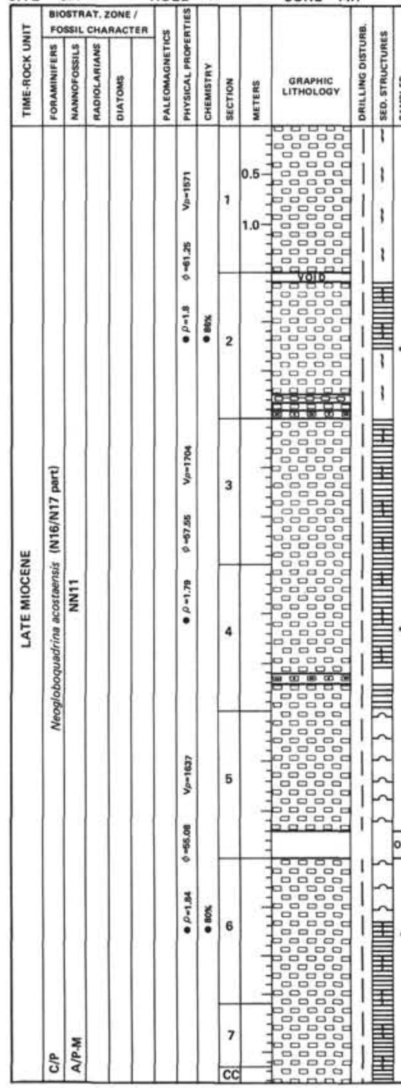
UNLITHIFIED PACKSTONE, white (10YR 8/1), occurs as several thin beds in Sections 4, 5 and 6. A single bed of LITHIFIED PACKSTONE occurs in Section 4, 141-144 cm; contains fine to medium sand.

CHALK, white (10YR 8/1), occurs as a single bed in Section 6, 109-112 cm.

SMEAR SLIDE SUMMARY (%):

	2,75 D	4,75 D	6,75 D
COMPOSITION:			
Feldspar	Tr	–	–
Foraminifers	50	25	30
Nannofossils	40	45	40
Skeletal Fragments	–	5	–
Micrite	10	25	30

SITE 630 HOLE A CORE 14H CORED INTERVAL 928.4-928.0 mbsl; 123.9-133.5 mbsf



LITHOLOGIC DESCRIPTION

CALCAREOUS OOZE, with minor UNLITHIFIED PACKSTONE and CHALK

CALCAREOUS OOZE, white (5Y 8/1, 10YR 8/1, 5Y 8/2), throughout core, with other minor lithologies interbedded. Burrowed, with fine sand infilling some burrows. Laminated, with glauconitic layers interbedded with non-glauconitic layers (laminations not disrupted by bioturbation). A major slump is present in Section 5 and the upper portion of Section 6.

UNLITHIFIED PACKSTONE, white (5Y 8/1), occurs in Section 2, 142-145 cm, *and Section 4,* 115-124 cm. *PACKSTONES* are graded and contain medium to fine sand.

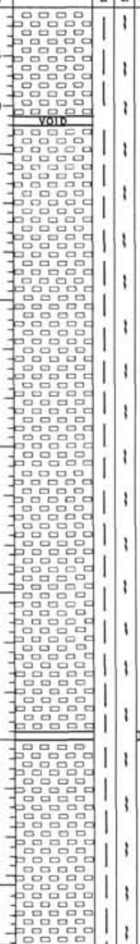
CHALK, white (5Y 8/1), occurs as a single bed in Section 2, 126-130 cm.

SMEAR SLIDE SUMMARY (%):

	2,75 D	4,75 D	6,75 D
COMPOSITION:			
Foraminifers	15	15	15
Nannofossils	55	40	55
Skeletal Fragments	–	10	–
Clasts	25	10	20
Pellets	–	10	–
Micrite	5	15	10

SITE 630 HOLE A CORE 15H CORED INTERVAL 938.0-947.6 mbsl; 133.5-143.1 mbsf

TIME-ROCK UNIT	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALEOMAGNETICS	PHYSICAL PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES
LATE MIOCENE	*Neogloboquadrina acostaensis* Zone (N16/17 part); C/P	NN11; A/P-M				Vp=1687; ϕ=59.95; ● ρ=1.86; Vp=1738; ϕ=54.25; ● ρ=1.84; Vp=1678; ϕ=52.98; ● ρ=1.87	● 79%	1, 2, 3, 4, 5, 6, 7, CC	0.5, 1.0	VOID			*, *, IW, *



CALCAREOUS OOZE

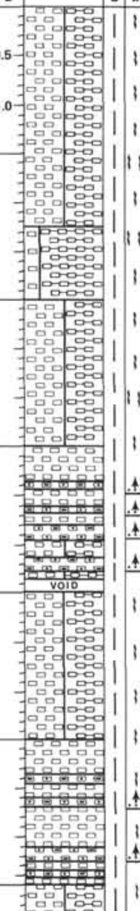
CALCAREOUS OOZE, white (5Y 8/1), throughout core. Grains are abundant in some intervals, such as the foraminifer-rich OOZE in Section 1, 88-120 cm. Faint glauconitic laminations are present, as are burrows and pyrite flecks.

SMEAR SLIDE SUMMARY (%):

	2,75 D	4,75 D	6,75 D
COMPOSITION:			
Foraminifers	30	30	35
Nannofossils	45	45	45
Intraclasts	Tr	—	—
Micrite	25	25	20

SITE 630 HOLE A CORE 16H CORED INTERVAL 947.6-957.3 mbsl; 143.1-152.8 mbsf

TIME-ROCK UNIT	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALEOMAGNETICS	PHYSICAL PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES
LATE MIOCENE	*Neogloboquadrina acostaensis* Zone (N16/17 part); C/P	NN11; A/P				Vp=1759; ϕ=52.17; ● ρ=1.86; Vp=1706; ϕ=54.93; ● ρ=1.82; Vp=1652; ϕ=55.24; ● ρ=1.82	● 74%	1, 2, 3, 4, 5, 6, 7	0.5, 1.0	VOID			*, *, *



CHALK, CALCAREOUS OOZE, with minor UNLITHIFIED PACKSTONE. No CC.

CHALK, white (5Y 8/1), occurs throughout core with other lithologies interbedded. OOZE and CHALK appear to alternate but couplets are indistinct. Pyrite and glauconite streaks occur; bioturbated, especially in Section 2, 0-78 cm. CALCAREOUS OOZE contains grains (foraminifers).

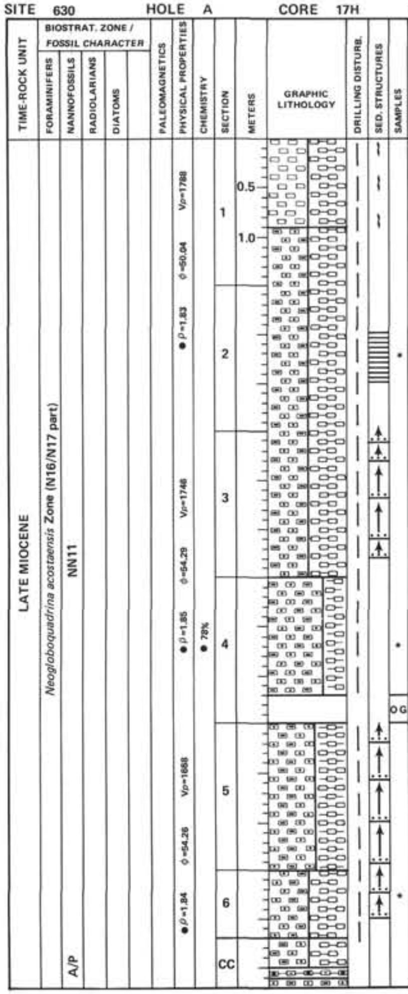
OOZE, white (10YR 8/1), occurs in Sections 4 and 6, interbedded with other lithologies.

UNLITHIFIED PACKSTONE, white (10YR 8/1), occurs as thin layers in Sections 4 and 6. Consists of foraminifer-rich fine sand; graded.

SMEAR SLIDE SUMMARY (%):

	2,75 D	4,75 D	6,75 D
COMPOSITION:			
Foraminifers	25	35	25
Nannofossils	35	40	40
Echinoid Fragments	5	5	10
Micrite	35	20	25

SITE 630 HOLE A CORE 17H CORED INTERVAL 957.3-966.9 mbsl; 152.8-162.4 mbsf



LITHOLOGIC DESCRIPTION

CHALK, UNLITHIFIED PACKSTONE, minor CALCAREOUS OOZE and PARTIALLY LITHIFIED PACKSTONE

CHALK and UNLITHIFIED PACKSTONE, white (10YR 8/1 and 5Y 8/2), alternate throughout core from Section 1, 90 cm, through the CC, 30 cm. PACKSTONES contain abundant foraminifers, and are graded.

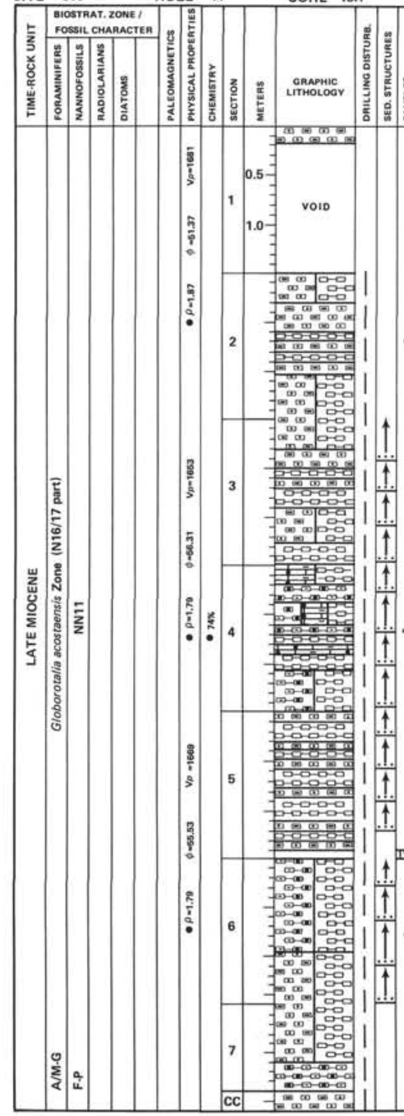
CHALKY CALCAREOUS OOZE, white (10YR 8/1), in Section 1, 0-90 cm. Bioturbated; contains a trace of pyrite.

PARTIALLY LITHIFIED PACKSTONE, white (2.5Y 8/2), in the CC, 30-50 cm.

SMEAR SLIDE SUMMARY (%):

	2,75	4,75	6,30
	D	D	D
COMPOSITION:			
Foraminifers	20	15	20
Nannofossils	35	35	25
Skeletal Fragments	10	20	20
Micrite	35	30	35
Dolomite	Tr	–	–

SITE 630 HOLE A CORE 18H CORED INTERVAL 966.9-976.4 mbsl; 162.4-171.9 mbsf



LITHOLOGIC DESCRIPTION

UNLITHIFIED PACKSTONE and CHALK, with minor PARTIALLY LITHIFIED and LITHIFIED PACKSTONE

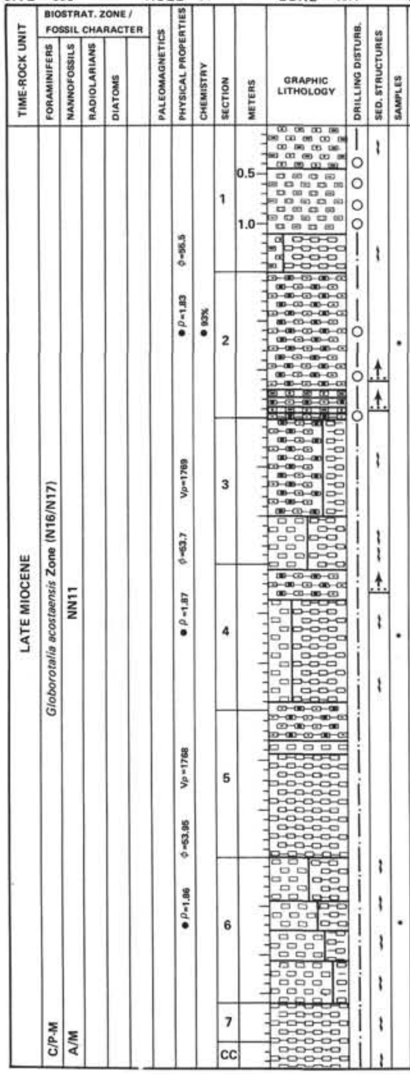
UNLITHIFIED PACKSTONE and CHALK, white (2.5Y 8/2, 10YR 8/1, 5Y 8/2), interbedded on a scale of several cm throughout core. Some discrete beds of UNLITHIFIED PACKSTONE and CHALK, 5-10 cm thick, are also present. PACKSTONE contains medium to fine sand.

PARTIALLY LITHIFIED and LITHIFIED PACKSTONE, white (5Y 8/2), occur both as discrete beds (5-10 cm thick) and alternating with CHALK on a scale of several cm.

SMEAR SLIDE SUMMARY (%):

	2,75	4,75	6,75
	D	D	D
COMPOSITION:			
Foraminifers	20	20	25
Nannofossils	20	30	40
Clasts	20	10	10
Micrite	40	40	25

SITE 630 HOLE A CORE 19X CORED INTERVAL 976.4-988.1 mbsl; 171.9-183.6 mbsf



LITHOLOGIC DESCRIPTION

CHALKY CALCAREOUS OOZE and PARTIALLY LITHIFIED PACKSTONE, with minor CALCAREOUS OOZE, CHALK, UNLITHIFIED PACKSTONE and UNLITHIFIED FLOATSTONE

CHALKY CALCAREOUS OOZE, white (10YR 8/1), occurs throughout core interbedded with other lithologies. OOZE is bioturbated and contains pyrite streaks.

PARTIALLY LITHIFIED PACKSTONE, white (10YR 8/1), occurs in Section 2, 0-150 cm, with UNLITHIFIED PACKSTONE interbeds; also in Section 3, 0-100 cm, alternating with CHALK; discrete beds of PARTIALLY LITHIFIED PACKSTONE occur in Section 4, 4-33 cm, and from Section 4, 141 cm, through Section 5, 29 cm. PACKSTONE contains very coarse sized grain aggregates and foraminifers.

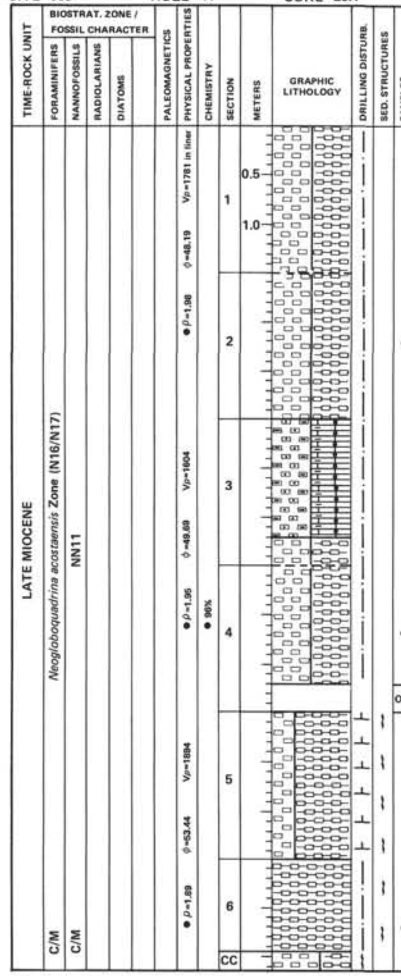
UNLITHIFIED PACKSTONE, white (10YR 8/1), occurs in Section 1, 0-46 cm, and as thin beds in Section 2, 121-123 cm and 137-141 cm; trace of bioturbation.

UNLITHIFIED FLOATSTONE, white (10YR 8/1), occurs in Section 1, 46-70 cm, contains clasts to 5 cm diameter.

SMEAR SLIDE SUMMARY (%):

	2,75	4,75	6,75
	D	D	D
COMPOSITION:			
Foraminifers	10	20	20
Nannofossils	30	30	35
Skeletal Fragments	15	15	10
Clasts	5	10	5
Micrite	40	25	30

SITE 630 HOLE A CORE 20X CORED INTERVAL 988.1-997.7 mbsl; 183.6-193.2 mbsf



LITHOLOGIC DESCRIPTION

CALCAREOUS OOZE and CHALK, with minor UNLITHIFIED to LITHIFIED PACKSTONE. "Drilling biscuits" present.

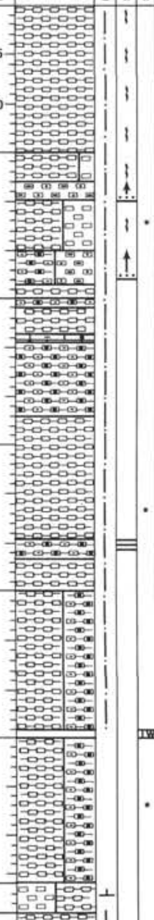
CALCAREOUS OOZE and CHALK, white (10YR 8/1, 5Y 8/1), occur from Section 1, 0 cm, through Section 2, 150 cm, and Section 3, 118 cm, through Section 5, 150 cm, and in the CC, as alternating beds, probably "drilling biscuits." An interval of CHALK alone occurs in Section 6, 0-96 cm.

UNLITHIFIED to LITHIFIED PACKSTONE, white (10YR 8/1), occurs in Section 3, 0-118 cm, as alternating beds, probably "drilling biscuits."

SMEAR SLIDE SUMMARY (%):

	2,75	4,75	6,75
	D	D	D
COMPOSITION:			
Foraminifers	10	15	15
Nannofossils	40	35	35
Skeletal Fragments	10	10	10
Clasts	10	10	10
Micrite	30	30	30

SITE 630 HOLE A CORE 21X CORED INTERVAL 997.7-1007.4 mbsf; 193.2-202.9 mbsf

TIME-ROCK UNIT	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALEOMAGNETICS	PHYSICAL PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES
LATE MIOCENE	*Neogloboquadrina acostaensis* Zone (N16/N17); C/M	NN11; A/G						1, 2, 3, 4, 5, 6, 7, CC	0.5, 1.0				*, *, *, IW

BIOSTRAT. ZONE / FOSSIL CHARACTER

LITHOLOGIC DESCRIPTION

CHALK and PARTIALLY LITHIFIED PACKSTONE, with minor CHALKY CALCAREOUS OOZE, UNLITHIFIED PACKSTONE and LITHIFIED PACKSTONE. Core material is disturbed by "biscuit deformation."

CHALK, white (5Y 8/1), occurs in Section 1, 0-150 cm, Section 2, 136-150 cm, from Section 3, 120 cm, through Section 4, 94 cm, and Section 4, 109-150 cm.

PARTIALLY LITHIFIED PACKSTONE, white (10YR 8/2), occurs in Section 3, 40-120 cm, and Section 4, 94-114 cm; also occurs grading to UNLITHIFIED PACKSTONE in Section 2, 104-136 cm, and to CHALK from Section 5, 0 cm, through Section 6, 150 cm, and in the CC.

CHALKY CALCAREOUS OOZE, white (5Y 8/1), occurs in Section 2, 0-32 cm and 44-104 cm, and in Section 7, 0-32 cm.

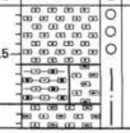
UNLITHIFIED PACKSTONE, white (5Y 8/1), occurs in Section 2, 32-44 cm, fines upwards from coarse sand containing foraminifers and grain aggregates.

LITHIFIED PACKSTONE, white (10YR 8/1), occurs as a thin bed in Section 3, 36-40 cm.

SMEAR SLIDE SUMMARY (%):

	2,75 D	4,75 D	6,75 D
COMPOSITION:			
Foraminifers	10	10	5
Nannofossils	35	35	45
Skeletal Fragments	15	15	10
Clasts	10	10	10
Micrite	30	30	30

SITE 630 HOLE A CORE 22X CORED INTERVAL 1007.4-1017.0 mbsl; 202.9-212.5 mbsf

TIME-ROCK UNIT	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALEOMAGNETICS	PHYSICAL PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES
LATE MIOCENE	*Neogloboquadrina acostaensis* Zone (N16/N17); A/M-G	NN11; R/P						1, CC	0.5				*, *

BIOSTRAT. ZONE / FOSSIL CHARACTER

LITHOLOGIC DESCRIPTION

UNLITHIFIED GRAINSTONE, PARTIALLY LITHIFIED PACKSTONE and UNLITHIFIED PACKSTONE

UNLITHIFIED GRAINSTONE, white (2.5Y 8/2), occurs in Section 1, 0-62 cm. Contains grain aggregates up to 0.2 cm diameter.

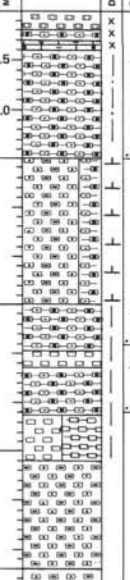
PARTIALLY LITHIFIED PACKSTONE to UNLITHIFIED PACKSTONE, white (10YR 8/1), in Section 1, 62-100 cm. Contains grain aggregates up to 0.4 cm diameter, foraminifers and drill string rust flakes; grades to UNLITHIFIED PACKSTONE.

UNLITHIFIED PACKSTONE, white (10YR 8/2), occurs in the CC.

SMEAR SLIDE SUMMARY (%):

	1,68 D	1,80 D
COMPOSITION:		
Foraminifers	15	20
Nannofossils	15	–
Skeletal Fragments	20	38
Clasts	15	40
Micrite	35	–
Echinoid Spines	–	2
Pteropods	–	Tr

SITE 630 HOLE A CORE 23X CORED INTERVAL 1017.0-1026.4 mbsl; 212.5-221.9 mbsf

TIME-ROCK UNIT	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALEOMAGNETICS	PHYSICAL PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES
LATE MIOCENE	*Neogloboquadrina acostaensis* Zone (N16/N17); C/P-M	R/P				Vp=1743; φ=54.16; ● ρ=1.87; Vp=1620; φ=40.17; ● ρ=2.06	● 92%	1, 2, 3, 4, CC	0.5, 1.0				*

BIOSTRAT. ZONE / FOSSIL CHARACTER

LITHOLOGIC DESCRIPTION

PARTIALLY LITHIFIED PACKSTONE and UNLITHIFIED PACKSTONE, with minor CHALK, CALCAREOUS OOZE, LITHIFIED PACKSTONE and UNLITHIFIED RUDSTONE (probably drilling breccia)

PARTIALLY LITHIFIED PACKSTONE, white (10YR 8/1, 10YR 8/2, and 2.5YR 8/2), occurs in Section 1, 20-30 cm and 50-150 cm, in Section 3, 0-46 cm and 65-115 cm (pale yellow, 5Y 8/3), and in Section 2, 0-150 cm, grading to UNLITHIFIED PACKSTONE. Contains fine to medium sand, no grading or bioturbation visible.

UNLITHIFIED PACKSTONE, white (10YR 8/2), occurs in Section 4 and in the CC. Contains coarse to very coarse sand, mostly grain aggregates, possible bioturbation.

CALCAREOUS OOZE, white (5Y 8/1), in Section 3, 46-65 cm, and Section 3, 115 cm, through Section 4, 10 cm.

LITHIFIED PACKSTONE, white (10YR 8/1), in Section 1, 30-35 cm.

UNLITHIFIED RUDSTONE, white (10YR 8/1), in Section 1, 0-20 cm; contains rounded clasts up to 3 cm diameter, is probably drilling breccia.

SMEAR SLIDE SUMMARY (%):

	2,82 D	4,80 D
COMPOSITION:		
Foraminifers	15	10
Nannofossils	15	25
Skeletal Fragments	15	10
Clasts	30	25
Micrite	25	30

SITE 630 HOLE A CORE 24X CORED INTERVAL 1026.4-1035.8 mbsl; 221.9-231.3 mbsf

TIME-ROCK UNIT: LATE MIOCENE

BIOSTRAT. ZONE / FOSSIL CHARACTER: *Neogloboquadrina acostaensis* Zone (N16/N17); FORAMINIFERS A/M-G

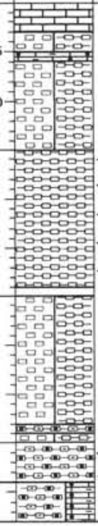
PHYSICAL PROPERTIES: Vp=1923 in liner; ϕ=51.02; ρ=1.9; Vp=1802 in liner; ϕ=48.49; ρ=1.93

CHEMISTRY: 92%

SECTION: 1, 2, 3, 4, CC

METERS: 0.5, 1.0

GRAPHIC LITHOLOGY



SAMPLES: IW

LITHOLOGIC DESCRIPTION

CHALK and CALCAREOUS OOZE, with minor LIMESTONE (LITHIFIED OOZE), PARTIALLY LITHIFIED PACKSTONE and LITHIFIED PACKSTONE. Core material disturbed by biscuit deformation. Strong odor of hydrogen sulfide.

CHALK, white (10YR 8/1), in Section 2, 0-150 cm, contains grains and pyrite streaks, possibly bioturbated. Hydrogen sulfide odor is strong. Interbedded with CALCAREOUS OOZE, white (5Y 8/1), in Section 1, 35-46 cm and 51-150 cm, and in Section 3, 0-130 cm and 140-150 cm. OOZE/CHALK alternations may be drilling biscuits.

LIMESTONE (LITHIFIED OOZE), white (5Y 8/1), in Section 1, 0-35 cm.

PARTIALLY LITHIFIED PACKSTONE, white (5Y 8/1), occurs in Section 3, 130-140 cm, in Section 4, 0-40 cm, and in the CC, 0-39 cm (grading to UNLITHIFIED PACKSTONE). Coarse grained, contains grain aggregates.

LITHIFIED PACKSTONE, white (5Y 8/1), occurs in Section 1, 46-51 cm.

SMEAR SLIDE SUMMARY (%):

	2,75
COMPOSITION:	
Foraminifers	10
Nannofossils	35
Skeletal Fragments	10
Clasts	15
Micrite	30

SITE 630 HOLE A CORE 25X CORED INTERVAL 1035.8-1045.4 mbsl; 231.3-240.9 mbsf

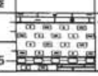
TIME-ROCK UNIT: LATE MIOCENE

BIOSTRAT. ZONE / FOSSIL CHARACTER: *Neogloboquadrina acostaensis* Zone (N16/N17); FORAMINIFERS A/M-G; LARGER BENTH. FORAM F/

SECTION: 1, CC

METERS: 0.5

GRAPHIC LITHOLOGY



LITHOLOGIC DESCRIPTION

UNLITHIFIED PACKSTONE, LITHIFIED PACKSTONE, LIMESTONE and CHALK

UNLITHIFIED PACKSTONE, white (2.5Y 8/2), in Section 1, 12-28 cm, and in the CC, 0-18 cm. Contains grain aggregates.

LITHIFIED PACKSTONE, white (2.5Y 8/2), occurs in Section 1, 0-12 cm; fragmented by drilling.

LIMESTONE, white (10YR 8/1), occurs in the CC, 18-26 cm.

CHALK, white (10YR 8/1), in the CC, 26-33 cm.

SMEAR SLIDE SUMMARY (%):

	1,20
	D
COMPOSITION:	
Foraminifers	15
Nannofossils	15
Skeletal Fragments	25
Clasts	10
Micrite	35

SITE 630 HOLE A CORE 26X CORED INTERVAL 1045.4-1054.8 mbsl; 240.9-250.3 mbsf

TIME-ROCK UNIT: LATE MIOCENE

BIOSTRAT. ZONE / FOSSIL CHARACTER: *Neogloboquadrina acostaensis* Zone N16/17; FORAMINIFERS F/P; NANNOFOSSILS R/P

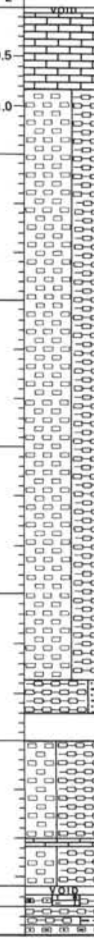
PHYSICAL PROPERTIES: Vp=1707 in liner; ϕ=55.0; ρ=1.89; Vp=1768 in liner; ϕ=55.34; ρ=1.86; Vp=1820; ϕ=48.83; ρ=1.92

CHEMISTRY: 86%

SECTION: 1, 2, 3, 4, 5, 6, 7, CC

METERS: 0.5, 1.0

GRAPHIC LITHOLOGY



SAMPLES: OG

LITHOLOGIC DESCRIPTION

CHALK and CALCAREOUS OOZE and LIMESTONE (LITHIFIED OOZE) with minor MARLY CHALK, UNLITHIFIED, PARTIALLY LITHIFIED and LITHIFIED PACKSTONE. Core material is disturbed by "biscuit deformation."

CHALK and CALCAREOUS OOZE, interbedded, various shades of white (2.5Y 8/2, 5Y 8/2, 10YR 8/1 and 10YR 8/2), occurs from Section 1, 59 cm, through Section 5, 86 cm. OOZE/CHALK alternations may be drilling biscuits.

LIMESTONE (LITHIFIED OOZE), white (2.5Y 8/2) to light gray (2.5Y 7/2), occurs in Section 1, 0-59 cm, and in Section 6, 97-102 cm.

MARLY CHALK, white (2.5Y 8/2), occurs in Section 5, 86-120 cm, and in the CC, 7-19 cm.

UNLITHIFIED, PARTIALLY LITHIFIED and LITHIFIED PACKSTONE, white (10YR 8/1), occurs in Section 7, 6-17 cm, grading to CHALK, and in the CC, 20-25 cm.

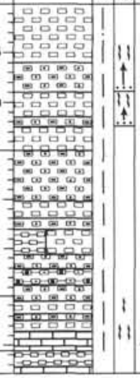
SMEAR SLIDE SUMMARY (%):

	2,75	4,75	6,75
	D	D	D
COMPOSITION:			
Foraminifers	15	20	25
Nannofossils	30	20	15
Skeletal Fragments	15	10	10
Clasts	10	10	15
Micrite	30	40	35

SITE 630 HOLE B CORE 1H CORED INTERVAL 804.5-808.3 mbsl; 0.0-3.8 mbsf

TIME-ROCK UNIT	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALEOMAGNETICS	PHYSICAL PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES
								1	0.5, 1.0				*
								2					
								3					*
								CC					

Header row "BIOSTRAT. ZONE / FOSSIL CHARACTER" spans FORAMINIFERS to DIATOMS.



LITHOLOGIC DESCRIPTION

CALCAREOUS OOZE and UNLITHIFIED PACKSTONE, with minor *PARTIALLY LITHIFIED PACKSTONE, CHALK and LIMESTONE (LITHIFIED OOZE)*

CALCAREOUS OOZE, light gray (2.5Y 7/2) to light brownish gray (2.5Y 6/2) to white (10YR 8/1), occurs throughout core interbedded with other lithologies.

CALCAREOUS OOZE and CHALK *interbedded, white* (10YR 8/2), occurs in Section 2, 81-106 cm.

UNLITHIFIED PACKSTONE, white (10YR 8/1, 10YR 8/2) to gray (10YR 7/2), occurs throughout core interbedded with other lithologies. Some intervals of PACKSTONE are graded; material up to coarse sand size occurs, including foraminifers and grain aggregates.

PARTIALLY LITHIFIED PACKSTONE, white (10YR 8/1), occurs in Section 2, 120-150 cm.

CHALK, white (10YR 8/1), occurs in the CC, 0-16 cm; contains large (up to 0.3 cm diameter) grain aggregates.

LIMESTONE (LITHIFIED OOZE), white (10YR 8/1), occurs in Section 3, 37-58 cm, and in the CC, 16-21 cm; contains darker bioturbated areas.

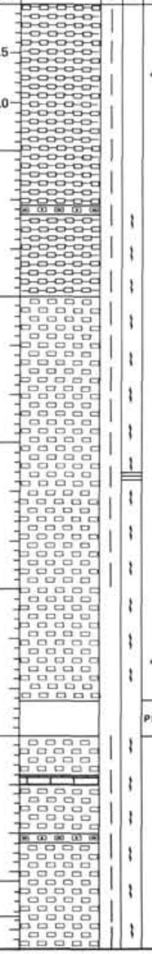
SMEAR SLIDE SUMMARY (%):

COMPOSITION:	1,75 D	3,45 D
Accessory Minerals	20	10
Foraminifers	5	20
Sponge Spicules	5	–
Pellets	10	10
Skeletal Fragments	20	15
Micrite	35	40
Pteropods	5	–
Clasts	–	5

SITE 630 HOLE B CORE 2H CORED INTERVAL 808.3-817.9 mbsl; 3.8-13.4 mbsf

TIME-ROCK UNIT	FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALEOMAGNETICS	PHYSICAL PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES
								1	0.5, 1.0				*
								2					
								3					
								4					
								5					*, PP
								6					
								7					
								CC					

Header row "BIOSTRAT. ZONE / FOSSIL CHARACTER" spans FORAMINIFERS to DIATOMS.



LITHOLOGIC DESCRIPTION

CALCAREOUS OOZE and CHALK, with minor UNLITHIFIED *PACKSTONE and LIMESTONE (LITHIFIED OOZE)*

CALCAREOUS OOZE, white (10YR 8/1), occurs from Section 3, 0 cm, through the base of the core, with one thin bed each of LIMESTONE and UNLITHIFIED PACKSTONE. OOZE is slightly stiff and contains purple-gray streaks, grain aggregates and some horizontal laminations.

CHALK, white (10YR 8/1), occurs from Section 1, 0 cm, through Section 2, 150 cm, with one thin bed of UNLITHIFIED PACKSTONE in Section 2. CHALK contains purple-gray streaks.

UNLITHIFIED PACKSTONE, white (10YR 8/1), occurs in Section 2, 55-67 cm, and Section 6, 104-107 cm. Contains very coarse skeletal debris, including echinoid plates, articulated bivalves (up to 0.3-0.5 cm diameter), pteropods and otoliths.

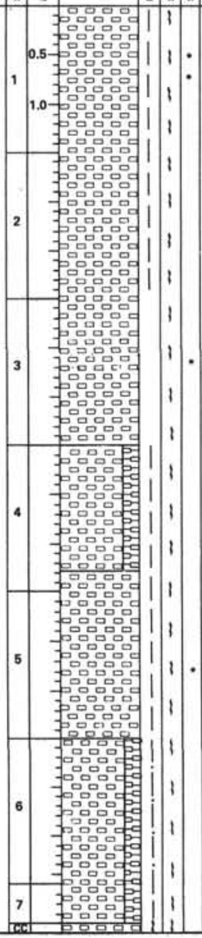
LIMESTONE, white (10YR 8/1), occurs in Section 6, 46-50 cm; contains some skeletal molds.

SMEAR SLIDE SUMMARY (%):

COMPOSITION.	1,75 D	5,75 D
Foraminifers	20	10
Nannofossils	25	25
Pellets	5	10
Skeletal Fragments	15	20
Clasts	5	10
Micrite	30	25

SITE 630 HOLE B CORE 3H CORED INTERVAL 817.9-827.3 mbsl; 13.4-22.8 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE / FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALEOMAGNETICS	PHYSICAL PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES



LITHOLOGIC DESCRIPTION

CALCAREOUS OOZE and minor CHALK

CALCAREOUS OOZE, white (10YR 8/1, 2.5Y 8/0), occurs throughout core with minor lithologies interbedded. OOZE contains small foraminifers and grain aggregates (fine sand size), purple-gray streaks, and burrows up to 2 cm diameter. OOZE in Section 3, 58-70 cm, Section 4, 129-150 cm, and Section 5, 45-71 cm, contains clay.

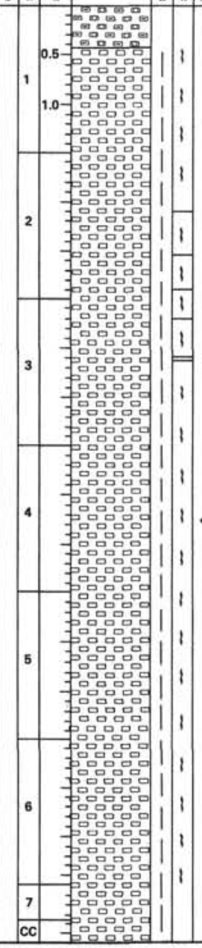
CALCAREOUS OOZE and CHALK, interbedded, white (10YR 8/1), occurs in Section 4, 0-125 cm, and in Section 6, 0 cm, through Section 7, 42 cm.

SMEAR SLIDE SUMMARY (%):

	1,45 D	1,75 D	3,68 D	5,75 D
COMPOSITION:				
Feldspar	–	–	Tr	–
Dolomite	–	–	20	–
Accessory Minerals:				
Gypsum ?	–	–	Tr	–
Pyrite	–	–	Tr	–
Foraminifers	10	10	–	10
Nannofossils	20	25	10	20
Pteropods	–	–	–	Tr
Skeletal Fragments	15	20	10	15
Clasts	5	5	–	10
Micrite	40	30	60	40
Pellets	10	10	–	5

SITE 630 HOLE B CORE 4H CORED INTERVAL 827.3-837.0 mbsl; 22.8-32.5 mbsf

TIME-ROCK UNIT	BIOSTRAT. ZONE / FOSSIL CHARACTER: FORAMINIFERS	NANNOFOSSILS	RADIOLARIANS	DIATOMS	PALEOMAGNETICS	PHYSICAL PROPERTIES	CHEMISTRY	SECTION	METERS	GRAPHIC LITHOLOGY	DRILLING DISTURB.	SED. STRUCTURES	SAMPLES



LITHOLOGIC DESCRIPTION

CALCAREOUS OOZE and minor UNLITHIFIED FLOATSTONE (probably drilling breccia)

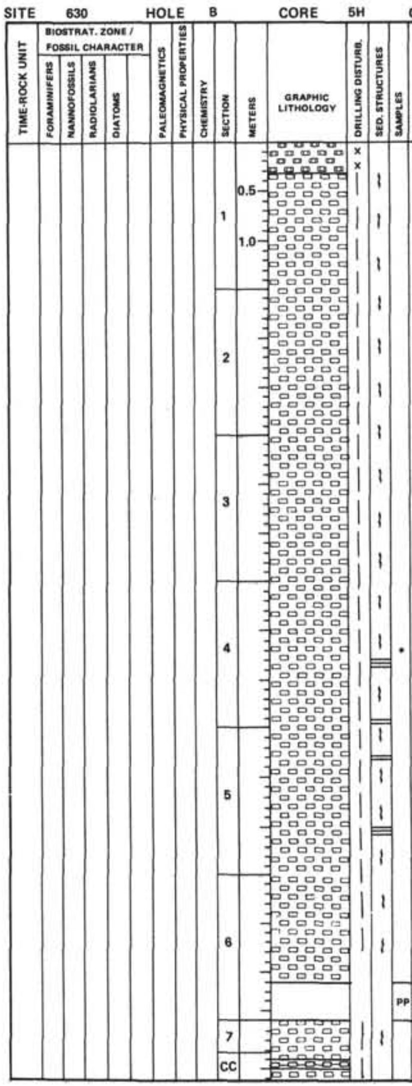
CALCAREOUS OOZE, white (10YR 8/1, 5Y 8/2), throughout core except for drilling breccia near top. Bioturbated, contains stringers and flecks of pyrite, and some glauconite. Some intervals of OOZE are somewhat chalky.

UNLITHIFIED FLOATSTONE, white (10YR 8/1), occurs in Section 1, 0-45 cm. Contains skeletal fragments and clasts; is probably drilling breccia.

SMEAR SLIDE SUMMARY (%):

	4,75
COMPOSITION:	
Foraminifers	20
Nannofossils	30
Sponge Spicules	Tr
Clasts	20
Micrite	30

SITE 630 HOLE B CORE 5H CORED INTERVAL 837.0-846.4 mbsl; 32.5-41.9 mbsf



LITHOLOGIC DESCRIPTION

CALCAREOUS OOZE, with minor CHALK and UNLITHIFIED RUDSTONE (probably drilling breccia)

CALCAREOUS OOZE, white (5Y 8/1), throughout core except for one thin CHALK bed in the CC, and drilling breccia at the top of the core. OOZE contains pyrite flecks and laminations and is somewhat chalky in certain intervals.

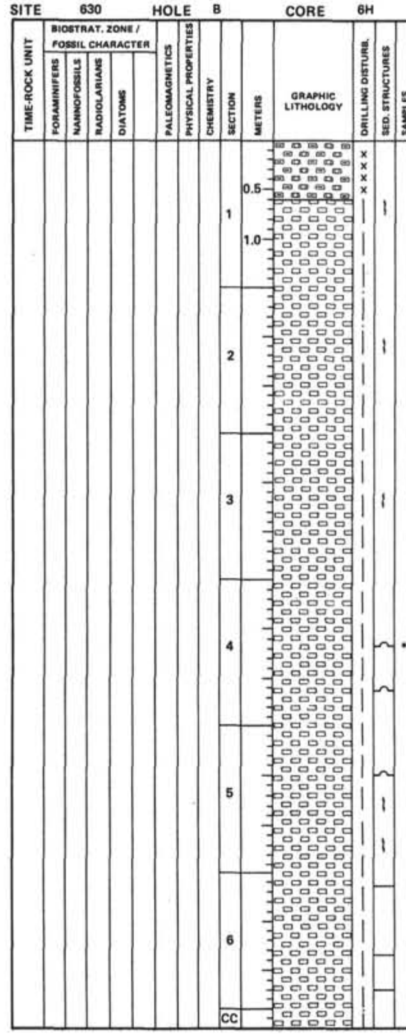
CHALK, white (5Y 8/1), occurs as a single bed in the CC, 10-15 cm.

UNLITHIFIED RUDSTONE, white (5Y 8/1), occurs in Section 1, 0-36 cm; is probably drilling breccia.

SMEAR SLIDE SUMMARY (%):

	4,75
COMPOSITION:	
Foraminifers	15
Nannofossils	40
Sponge Spicules	5
Clasts	10
Micrite	30

SITE 630 HOLE B CORE 6H CORED INTERVAL 846.4-856.0 mbsl; 41.9-51.5 mbsf



LITHOLOGIC DESCRIPTION

CALCAREOUS OOZE and minor UNLITHIFIED FLOATSTONE (probably drilling breccia)

CALCAREOUS OOZE, white (5Y 8/1), occurs throughout core except for drilling breccia. Bioturbated, somewhat chalky in certain intervals. Some inclined laminae are present but do not appear to represent a slump.

UNLITHIFIED FLOATSTONE, white (5Y 8/1), occurs in Section 1, 0-58 cm, probably is drilling breccia.

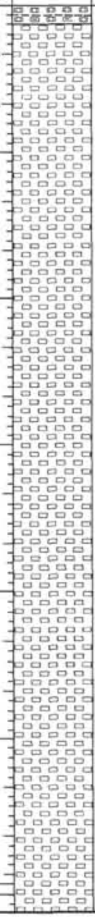
SMEAR SLIDE SUMMARY (%):

	4,75
	D
COMPOSITION:	
Foraminifers	25
Nannofossils	40
Skeletal Fragments	15
Micrite	20

SITE 630 HOLE B CORE 7H CORED INTERVAL 856.0-865.7 mbsl; 51.5-61.2 mbsf

TIME-ROCK UNIT | BIOSTRAT. ZONE / FOSSIL CHARACTER: FORAMINIFERS, NANNOFOSSILS, RADIOLARIANS, DIATOMS | PALEOMAGNETICS | PHYSICAL PROPERTIES | CHEMISTRY | SECTION | METERS | GRAPHIC LITHOLOGY | DRILLING DISTURB. | SED. STRUCTURES | SAMPLES | LITHOLOGIC DESCRIPTION

Sections: 1, 2, 3, 4, 5, 6, 7, CC; Meters: 0.5, 1.0



CALCAREOUS OOZE with minor UNLITHIFIED RUDSTONE and UNLITHIFIED FLOATSTONE (probably drilling breccia)

CALCAREOUS OOZE, white (5Y 8/1), occurs throughout core except for drilling breccia. OOZE is bioturbated, and somewhat chalky in certain intervals. Contains pyrite flecks and stringers and rare laminations.

UNLITHIFIED RUDSTONE and UNLITHIFIED FLOATSTONE, white (5Y 8/1), occur in Section 1, 0-19 cm, probably drilling breccia.

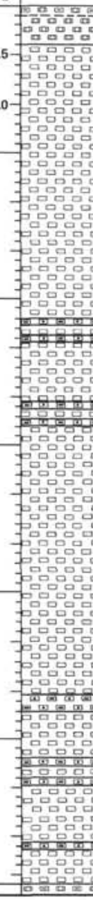
SMEAR SLIDE SUMMARY (%):

	4,75
	D
COMPOSITION:	
Foraminifers	25
Nannofossils	35
Skeletal Fragments	15
Micrite	25

SITE 630 HOLE B CORE 8H CORED INTERVAL 865.7-875.3 mbsl; 61.7-70.8 mbsf

TIME-ROCK UNIT | BIOSTRAT. ZONE / FOSSIL CHARACTER: FORAMINIFERS, NANNOFOSSILS, RADIOLARIANS, DIATOMS | PALEOMAGNETICS | PHYSICAL PROPERTIES | CHEMISTRY | SECTION | METERS | GRAPHIC LITHOLOGY | DRILLING DISTURB. | SED. STRUCTURES | SAMPLES | LITHOLOGIC DESCRIPTION

Sections: 1, 2, 3, 4, 5, 6, CC; Meters: 0.5, 1.0



CALCAREOUS OOZE and UNLITHIFIED PACKSTONE, with minor UNLITHIFIED FLOATSTONE and UNLITHIFIED RUDSTONE to UNLITHIFIED FLOATSTONE (probably drilling breccia)

CALCAREOUS OOZE, white (5Y 8/1), throughout core, with UNLITHIFIED PACKSTONE interbedded in Sections 3, 5 and 6. OOZE is somewhat chalky in certain intervals, contains pyrite flecks and stringers, and is bioturbated.

UNLITHIFIED PACKSTONE, white (5Y 8/1), occurs in Sections 3, 5, and 6 in beds 5-10 cm thick. Contains medium to fine sand, including foraminifers.

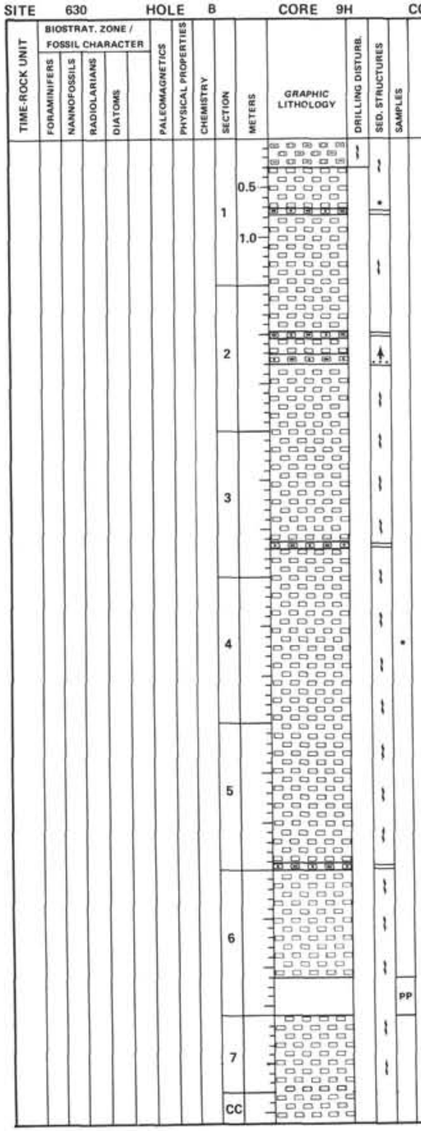
UNLITHIFIED FLOATSTONE, white (5Y 8/1), occurs in the CC, 0-11 cm. Contains chalky clasts.

UNLITHIFIED RUDSTONE to UNLITHIFIED FLOATSTONE, white (5Y 8/1), in Section 1, 0-40 cm; is probably drilling breccia.

SMEAR SLIDE SUMMARY (%):

	4,75
	D
COMPOSITION:	
Foraminifers	30
Nannofossils	35
Skeletal Fragments	15
Micrite	20

SITE 630 HOLE B CORE 9H CORED INTERVAL 876.3-884.9 mbsl; 70.8-80.4 mbsf



LITHOLOGIC DESCRIPTION

CALCAREOUS OOZE with minor UNLITHIFIED PACKSTONE and UNLITHIFIED FLOATSTONE (probably drilling breccia)

CALCAREOUS OOZE, white (5Y 8/1), occurs throughout core except for several thin PACKSTONE beds and drilling breccia at the top of the core. OOZE is somewhat chalky in certain intervals, and is bioturbated (some burrows have sandy fill); contains clasts of CHALK in the CC.

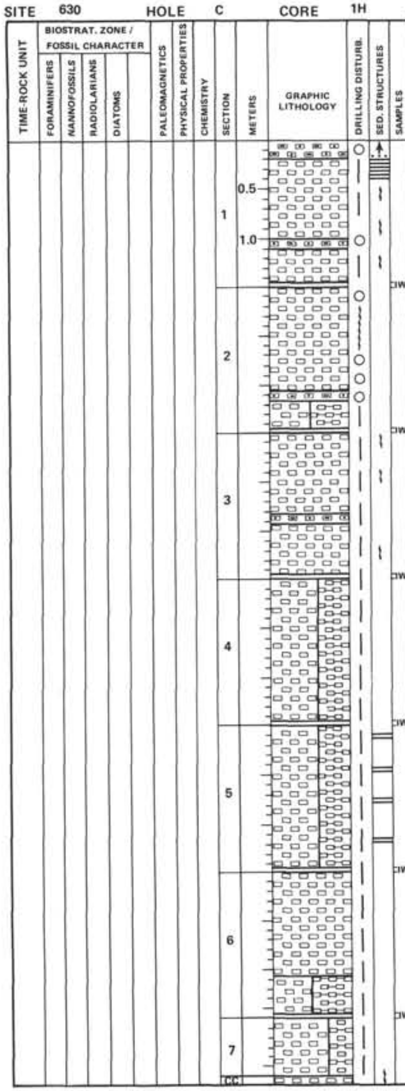
UNLITHIFIED PACKSTONE, white (5Y 8/1), occurs in Sections 1, 2, 3, and 5 in beds 4 to 10 cm thick. Contains fine sand.

UNLITHIFIED FLOATSTONE, white (5Y 8/1), occurs in Section 1, 0-32 cm; is probably drilling breccia.

SMEAR SLIDE SUMMARY (%):

	4,75
COMPOSITION:	
Foraminifers	25
Nannofossils	40
Skeletal Fragments	5
Clasts	10
Micrite	20

SITE 630 HOLE C CORE 1H CORED INTERVAL 804.5-813.8 mbsl; 0.0-9.3 mbsf

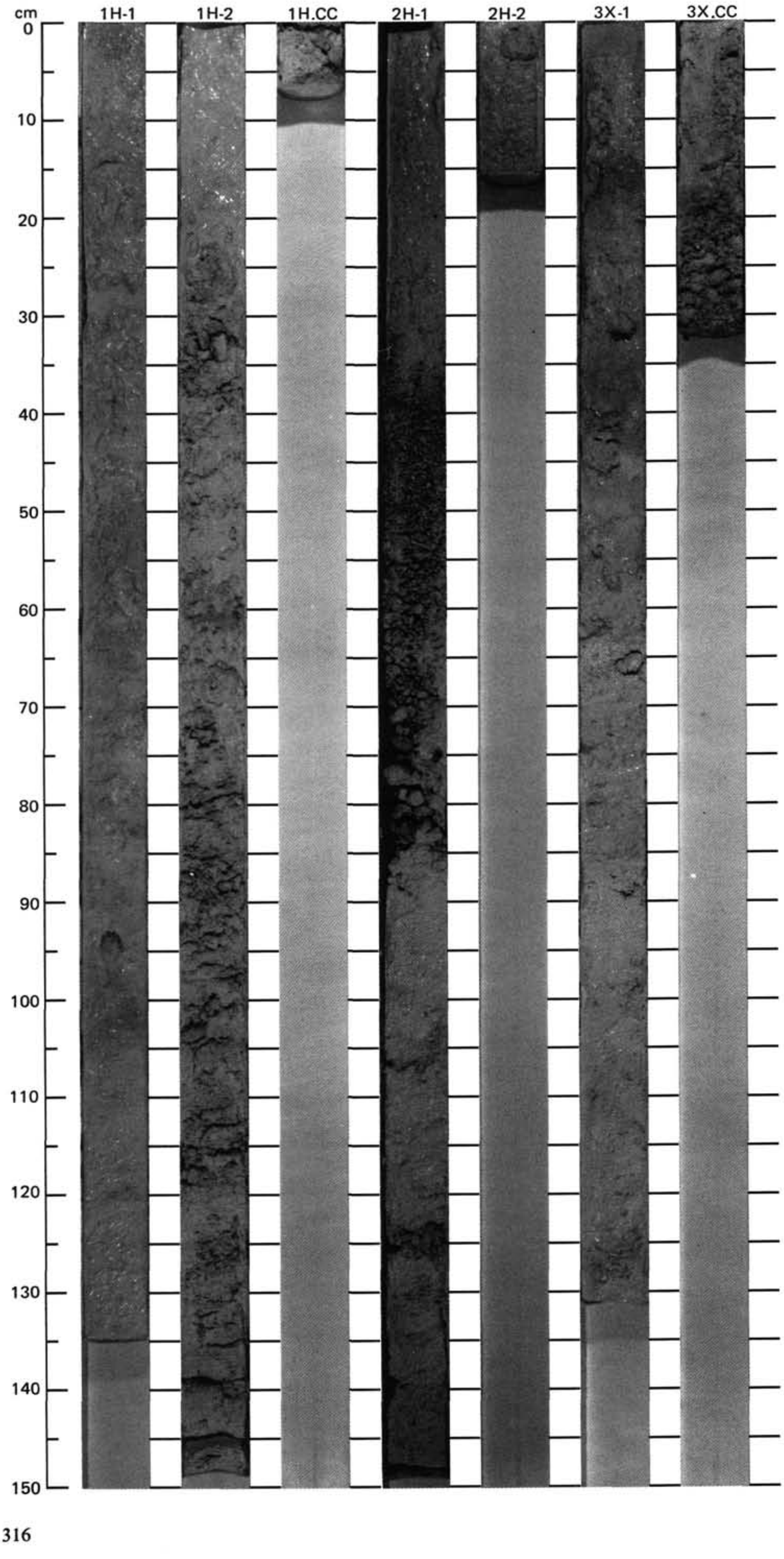


LITHOLOGIC DESCRIPTION

CALCAREOUS OOZE and CHALK with minor UNLITHIFIED PACKSTONE and HEMIPELAGIC MUD

CALCAREOUS OOZE, white (10YR 8/1) to light gray (10YR 7/1), occurs from Section 1, 19 cm, through Section 3, 145 cm, with a few thin beds of PACKSTONE in Section 6, 0-107 cm, and in the CC. OOZE is slightly bioturbated. OOZE, with CHALK interbedded, white (10YR 8/1), occurs in Section 2, 117-145 cm, and from Section 5, 0 cm, through Section 7, 20 cm. Includes both OOZE grading to CHALK and alternating OOZE/CHALK couplets. OOZE containing clay, light gray (10YR 7/2), occurs in Section 3, 92-95 cm.

UNLITHIFIED PACKSTONE, white (10YR 8/1) and light gray (10YR 7/1), occurs in Section 1, 0-19 cm, and 101-110 cm, Section 2, 110-117 cm, and in Section 3, 86-92 cm. Contains fine to medium sand, with some pteropods.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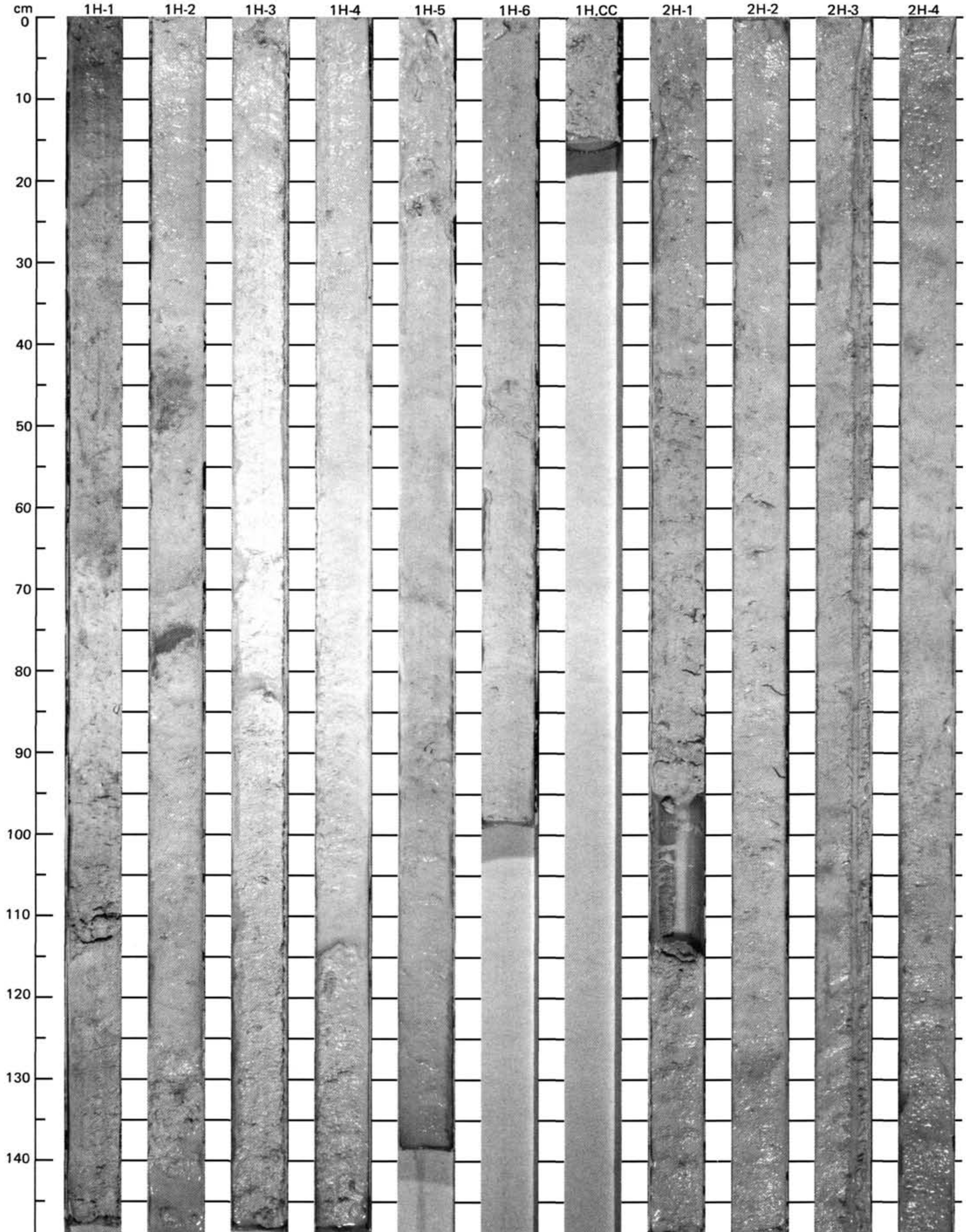
3X.CC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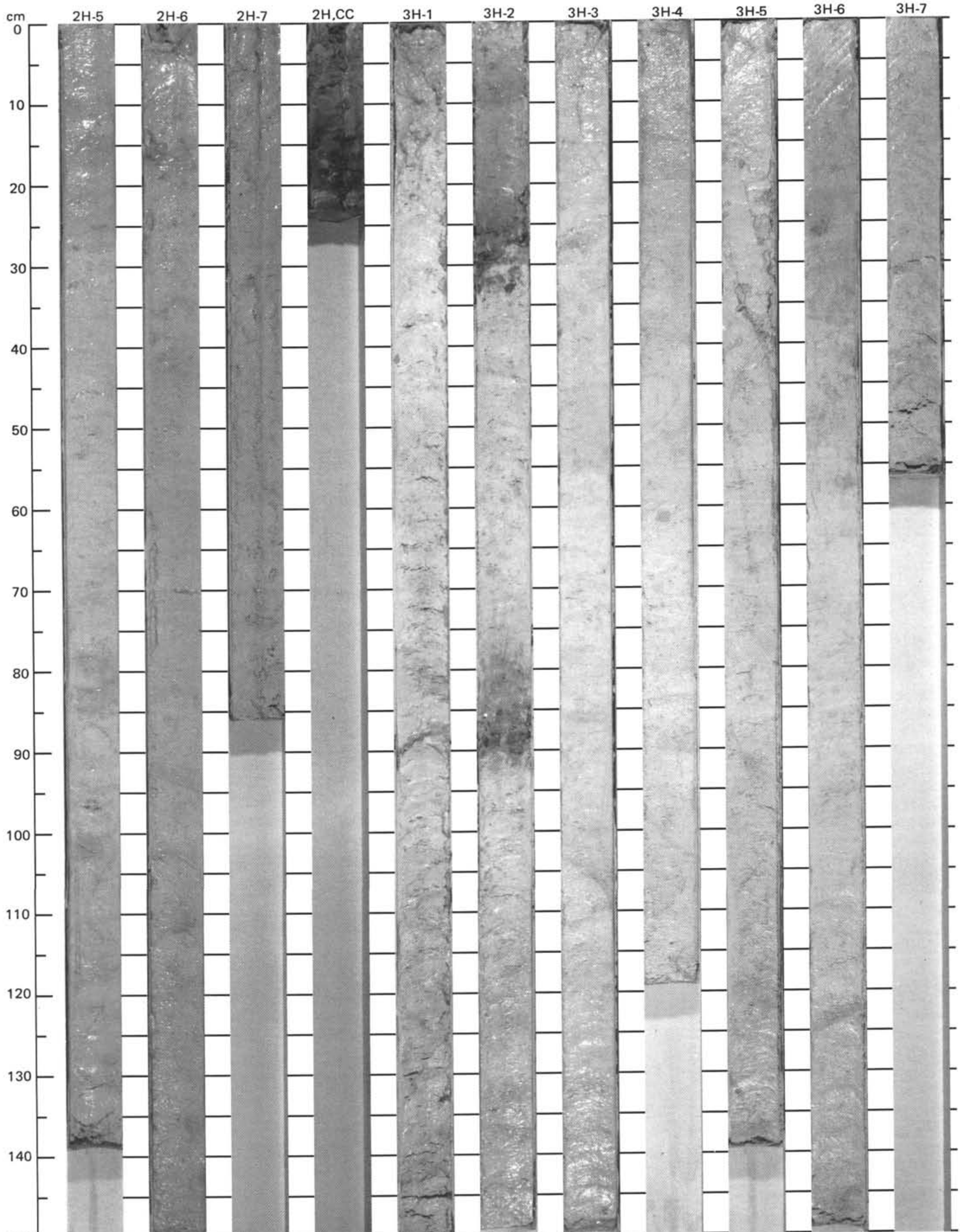
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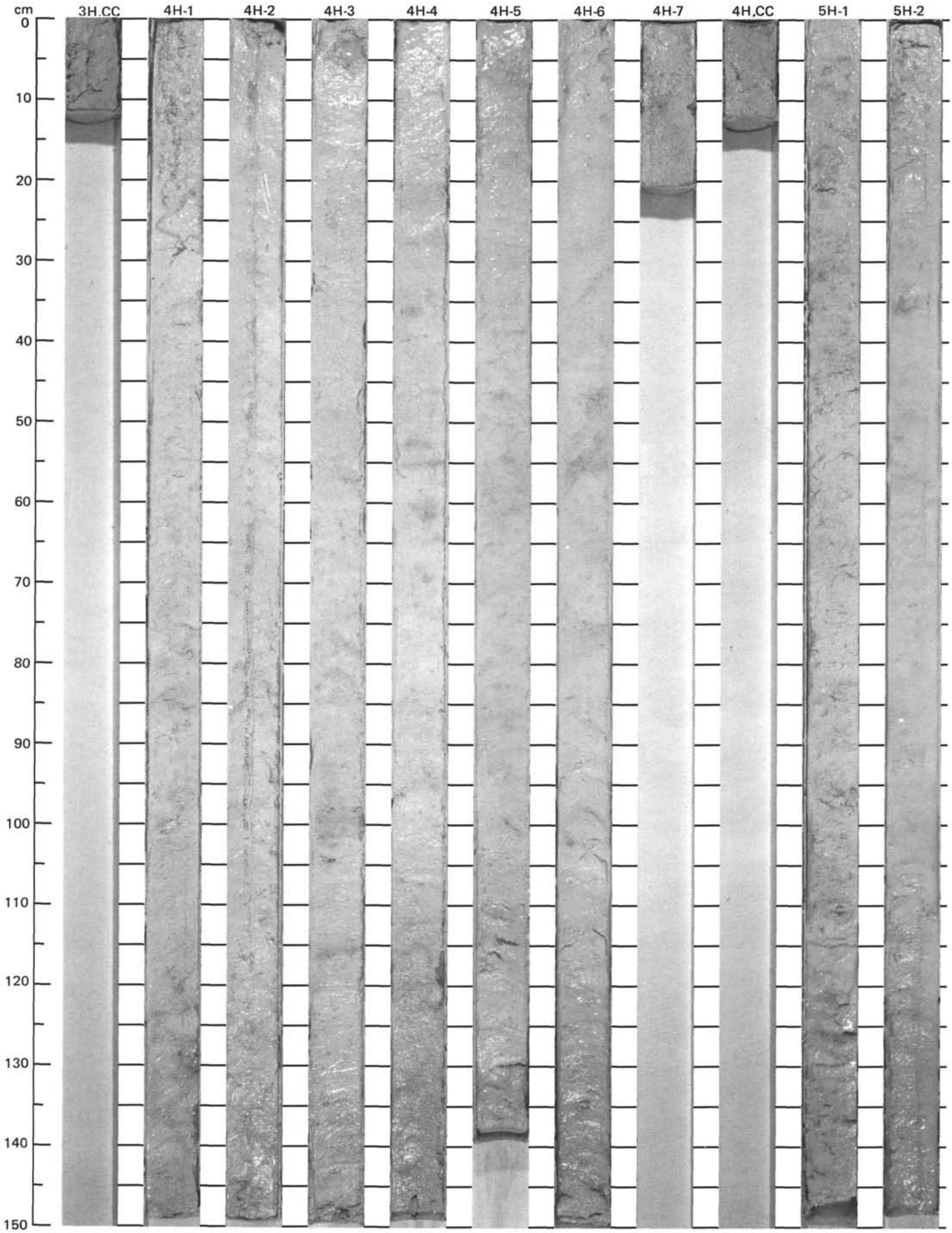
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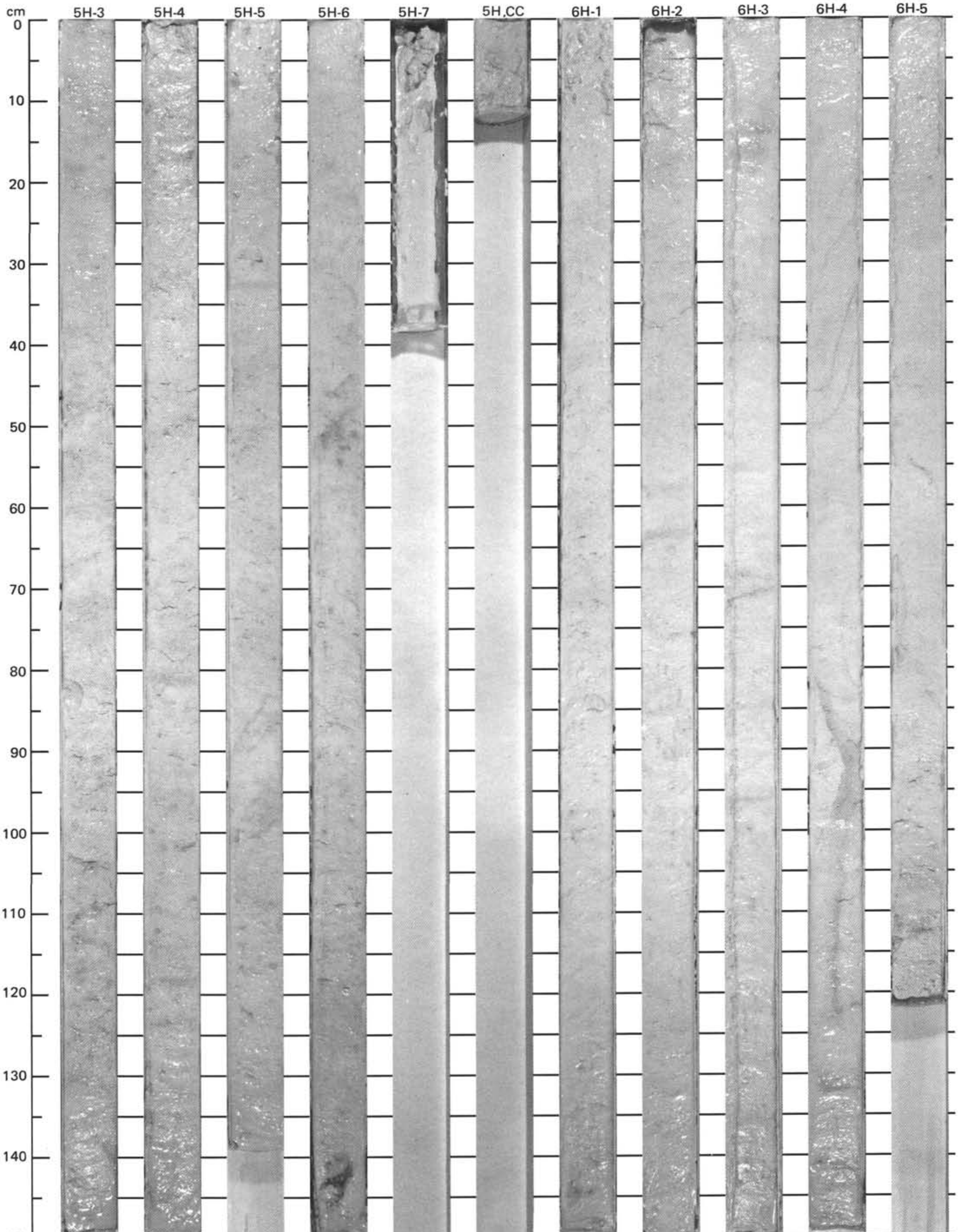
5H-2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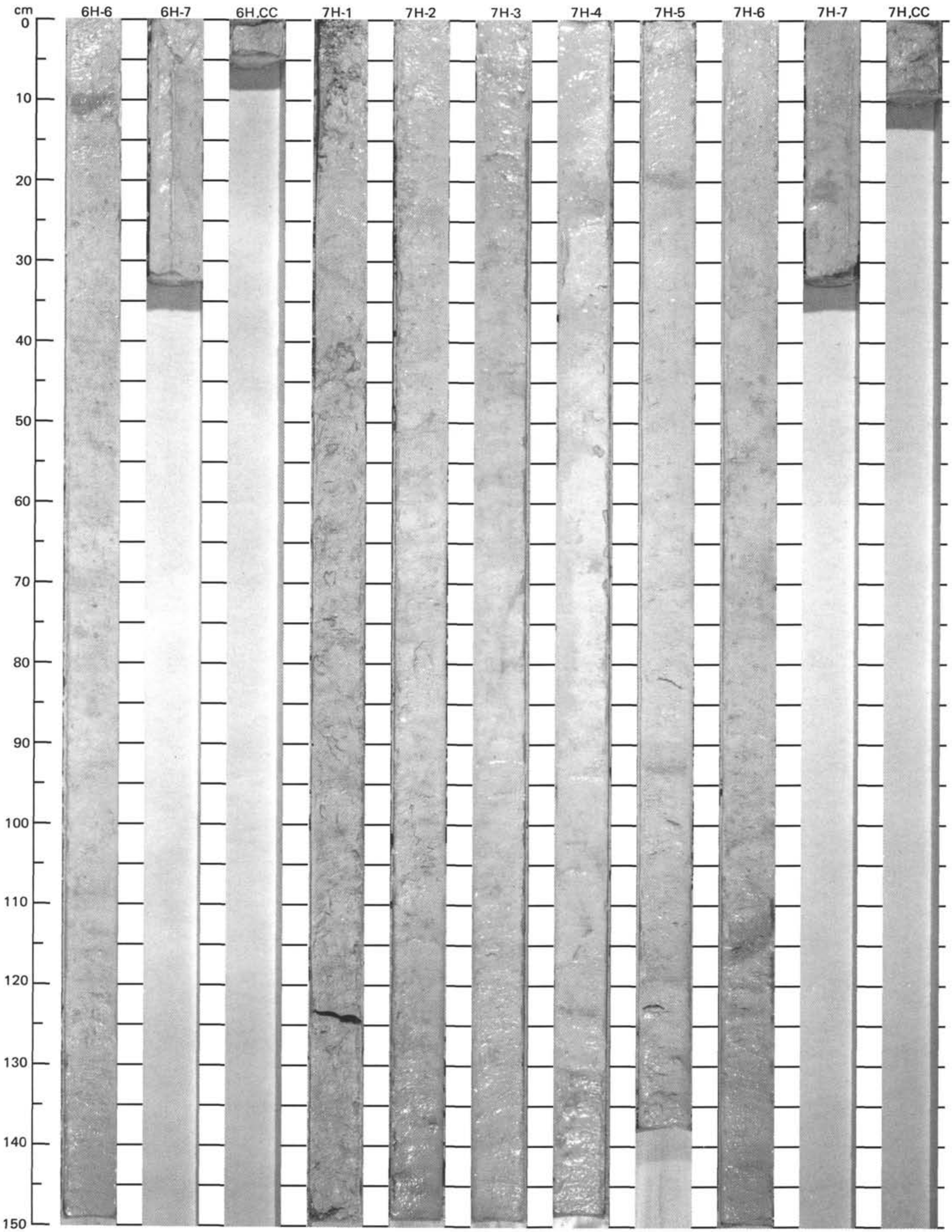

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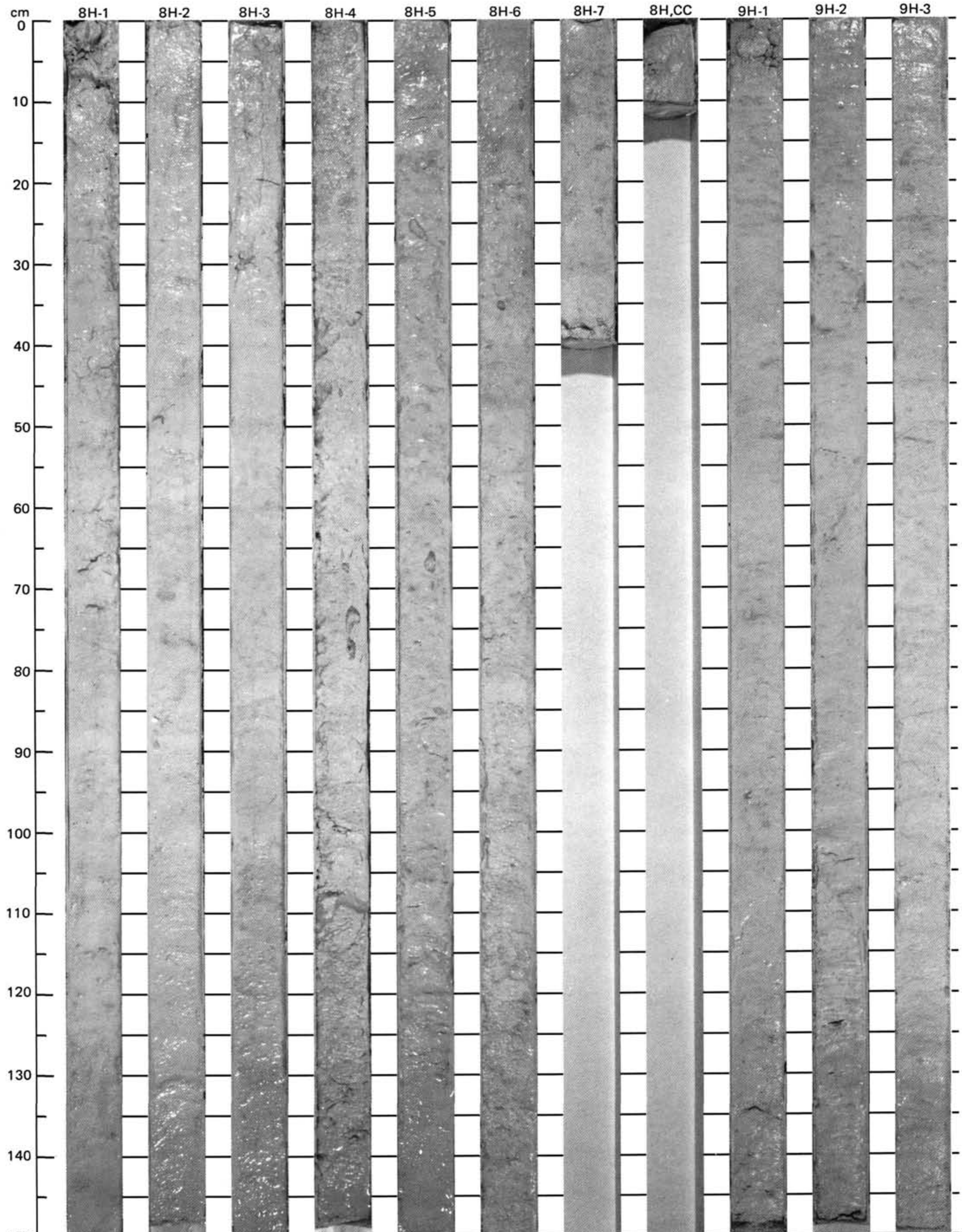
7H,CC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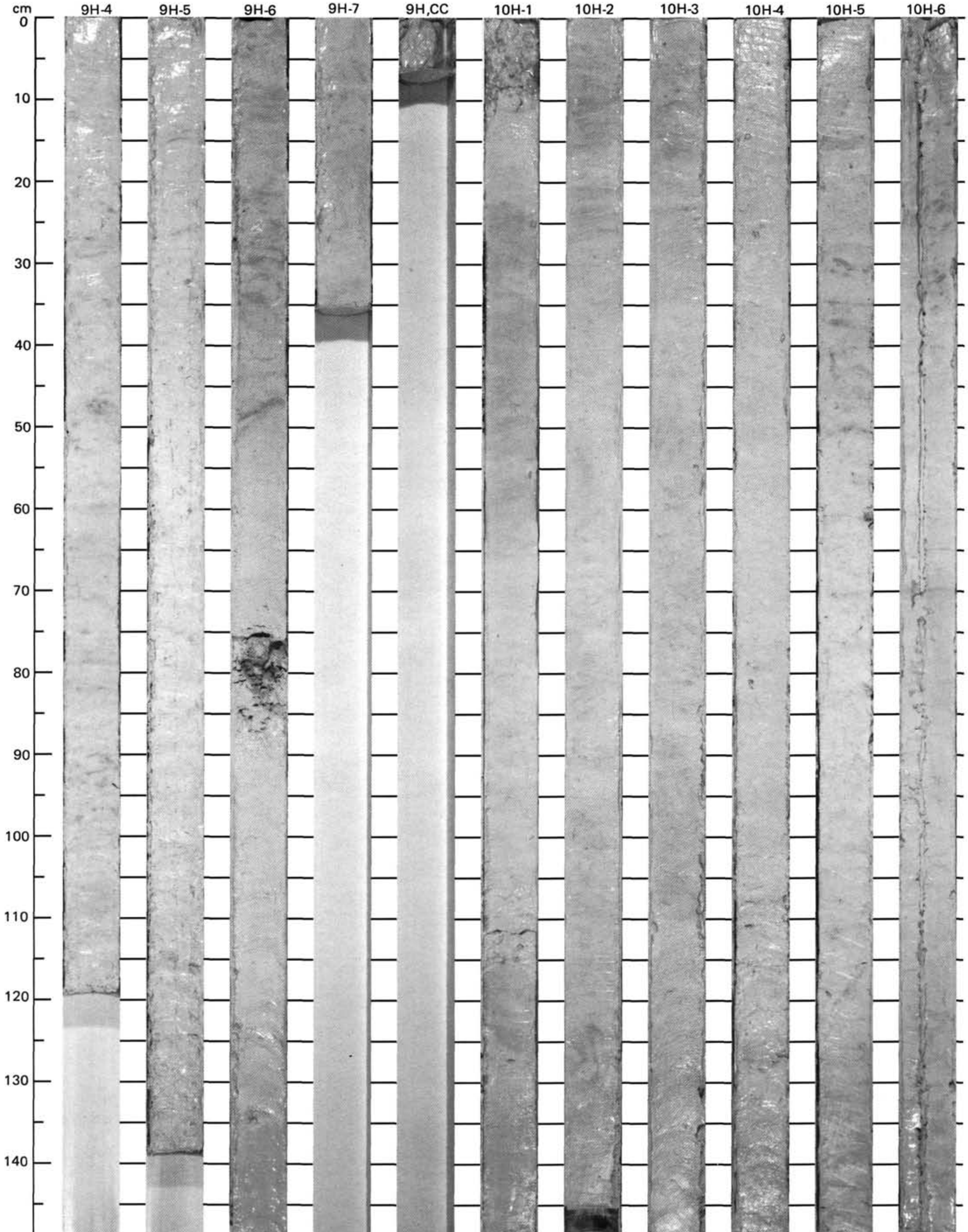
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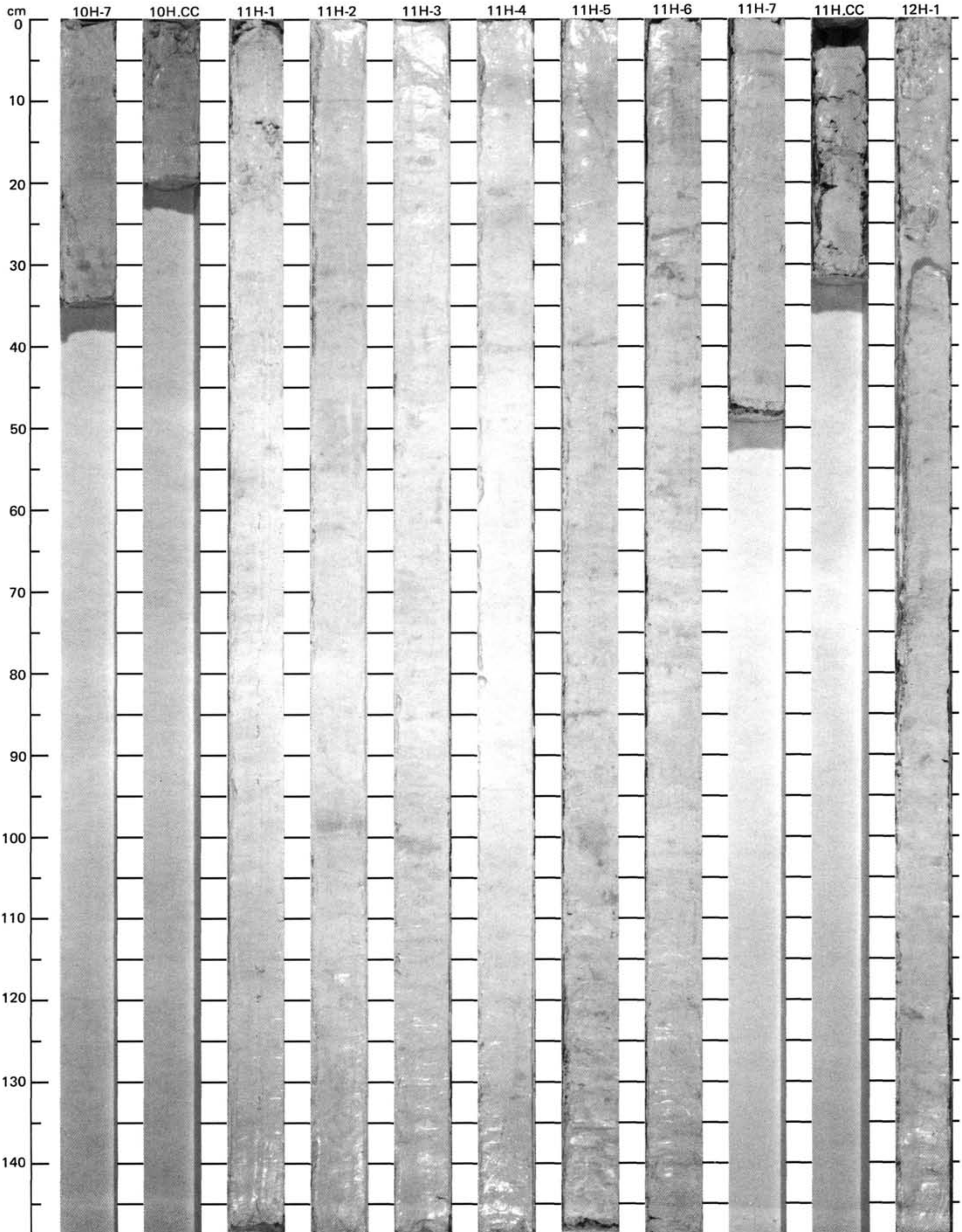
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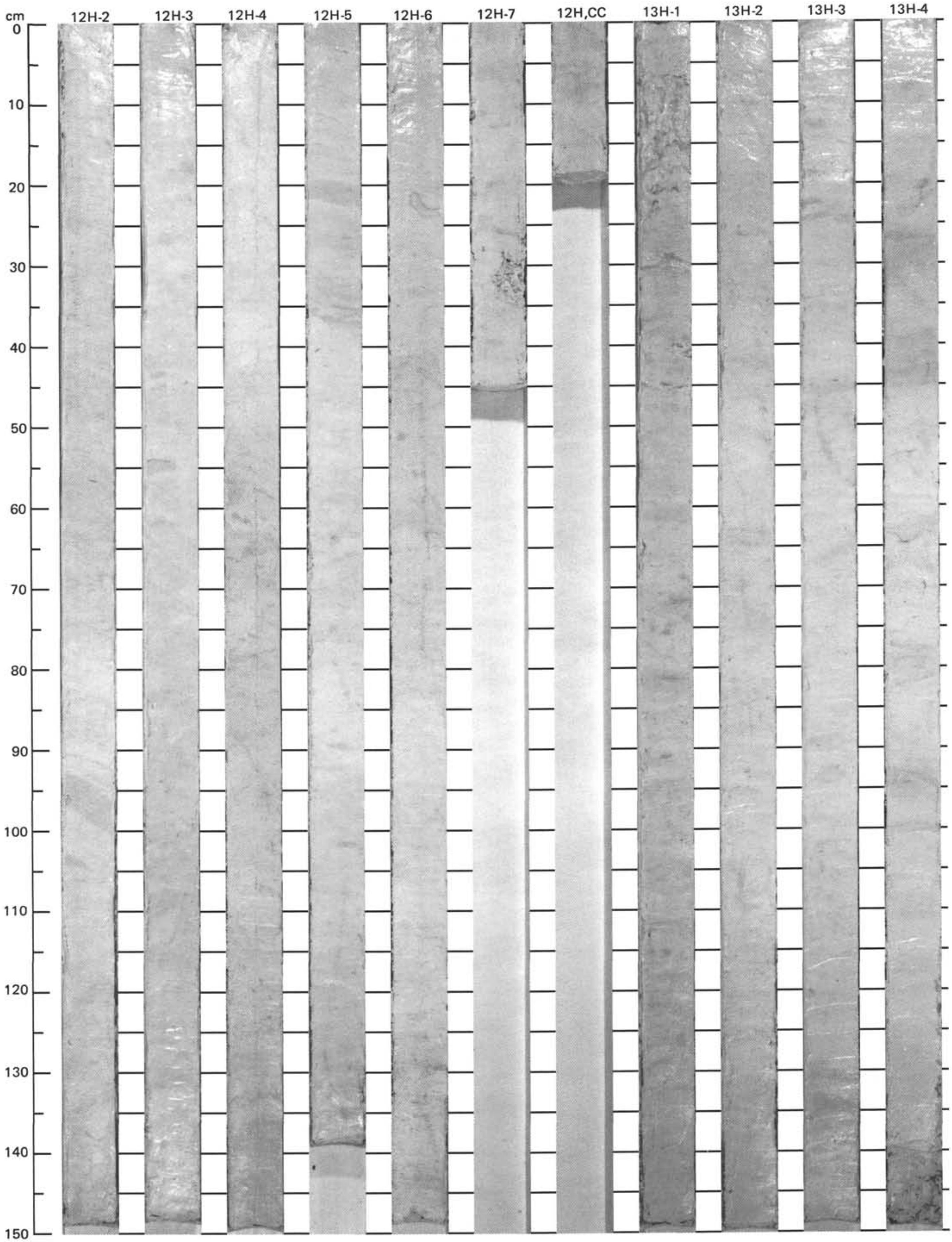
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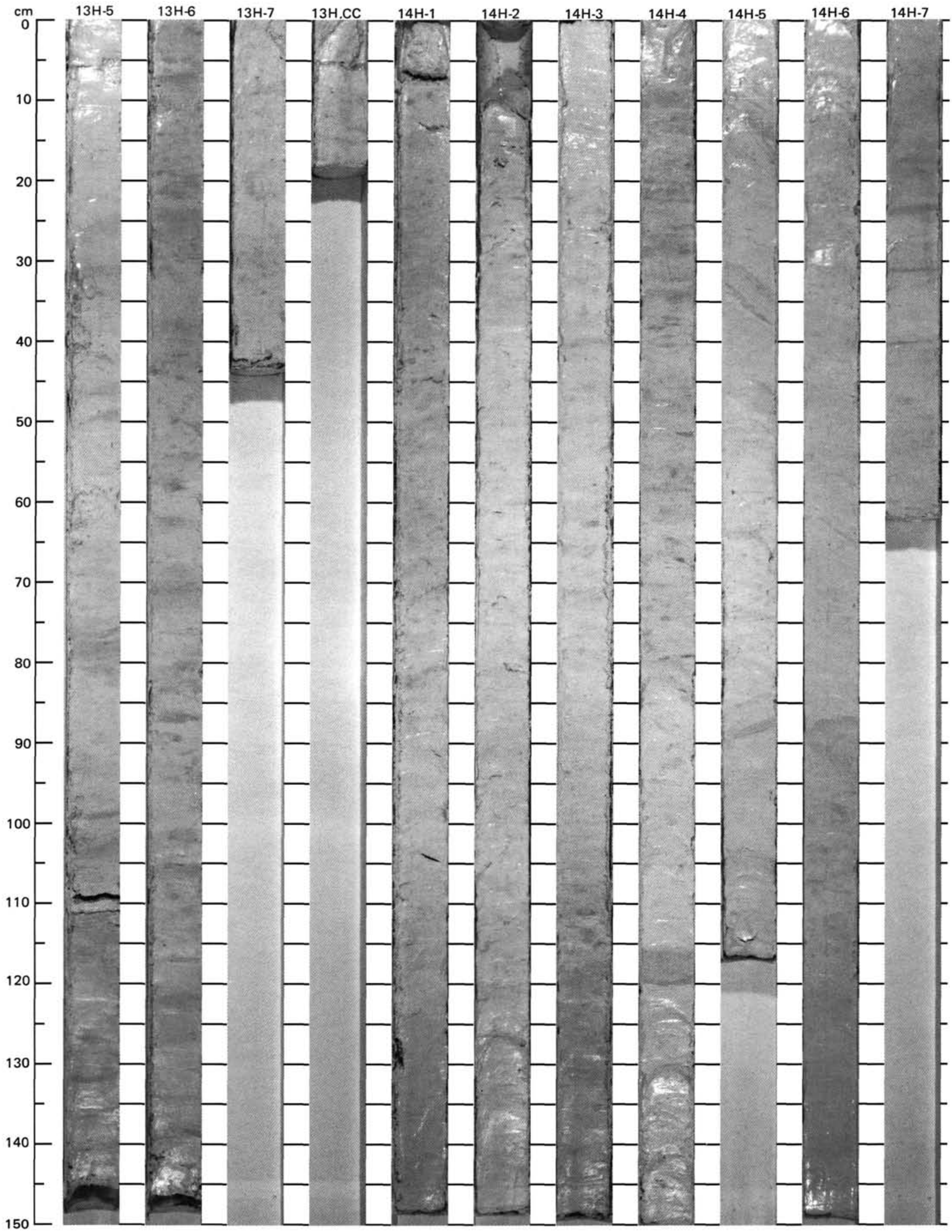
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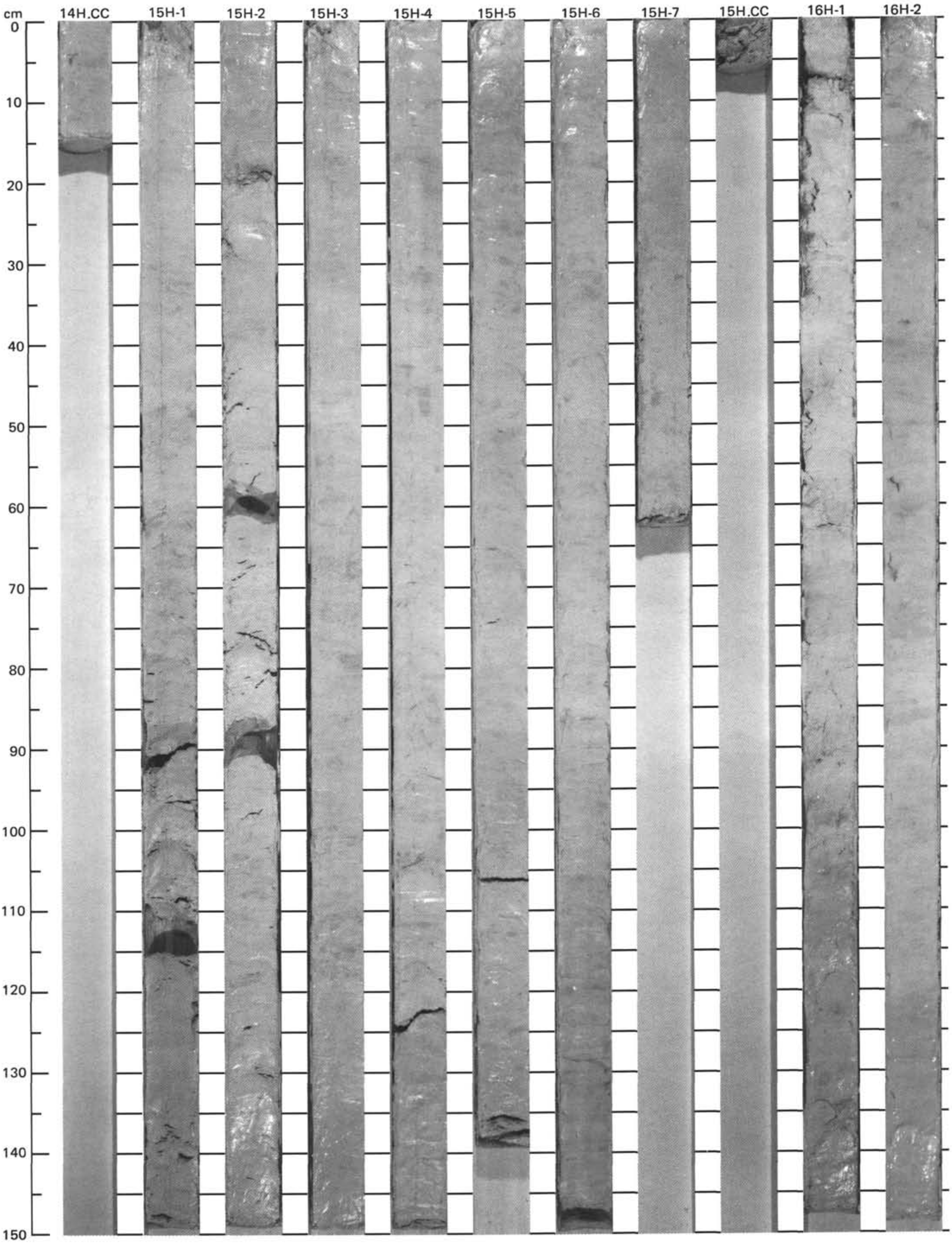
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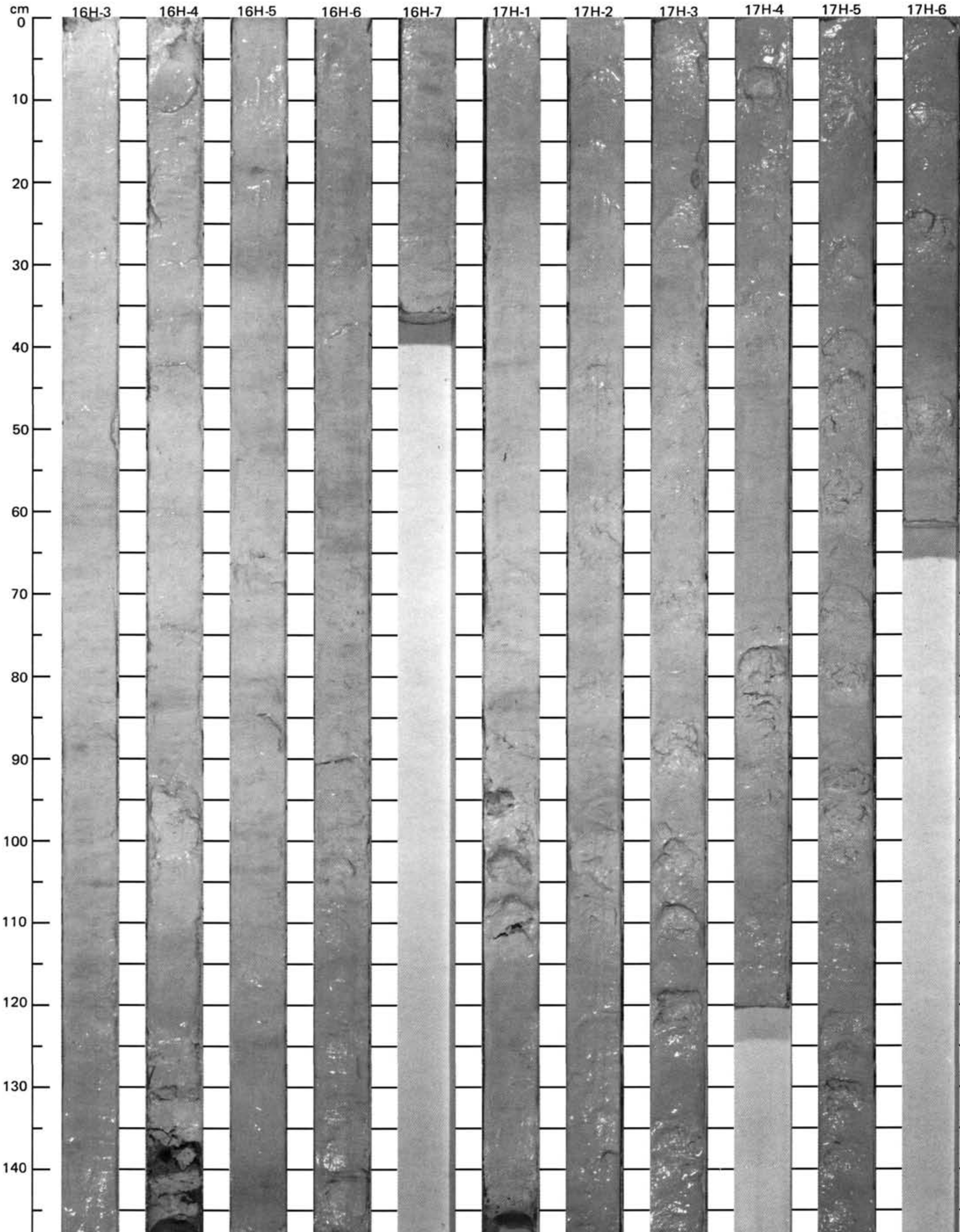
16H-2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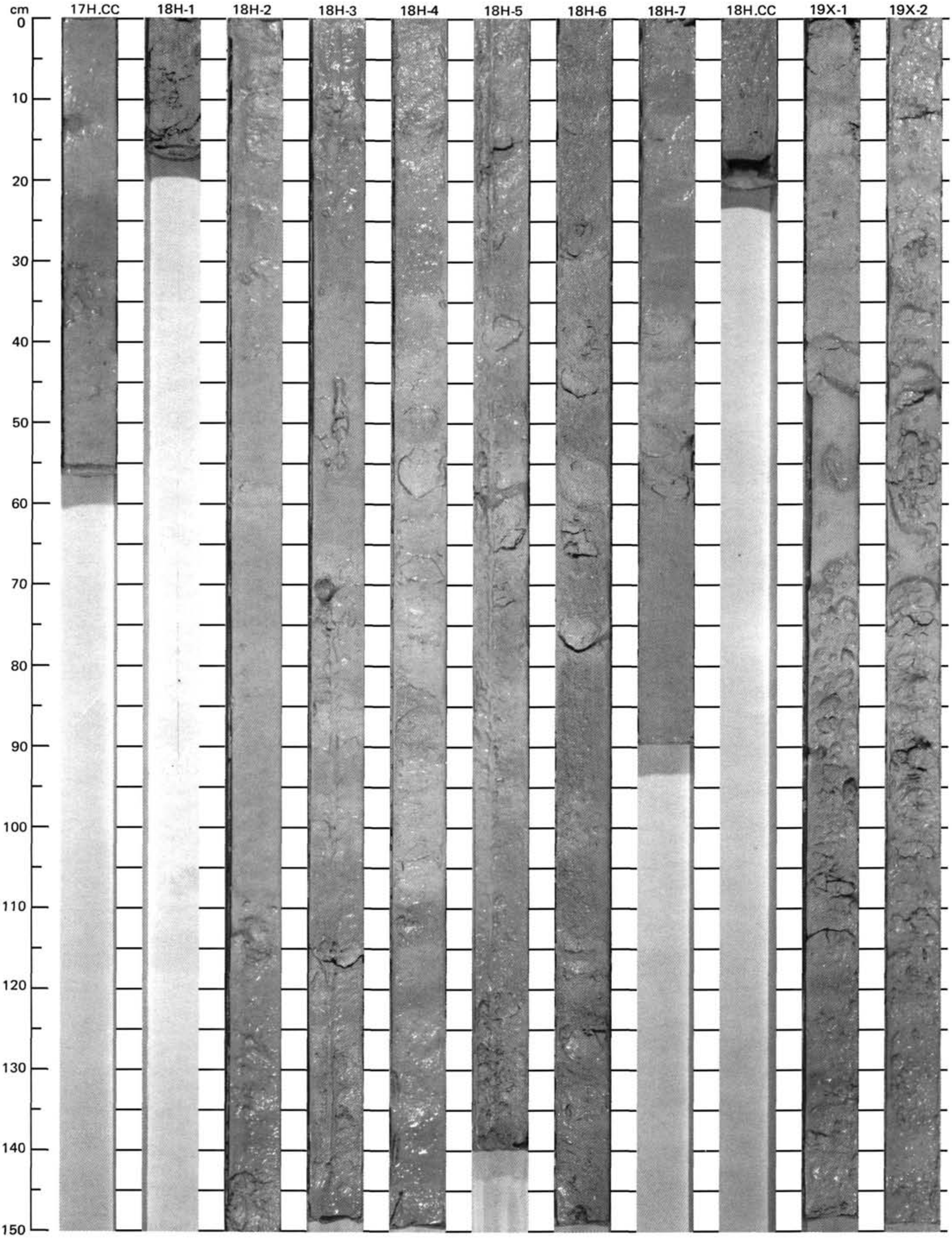
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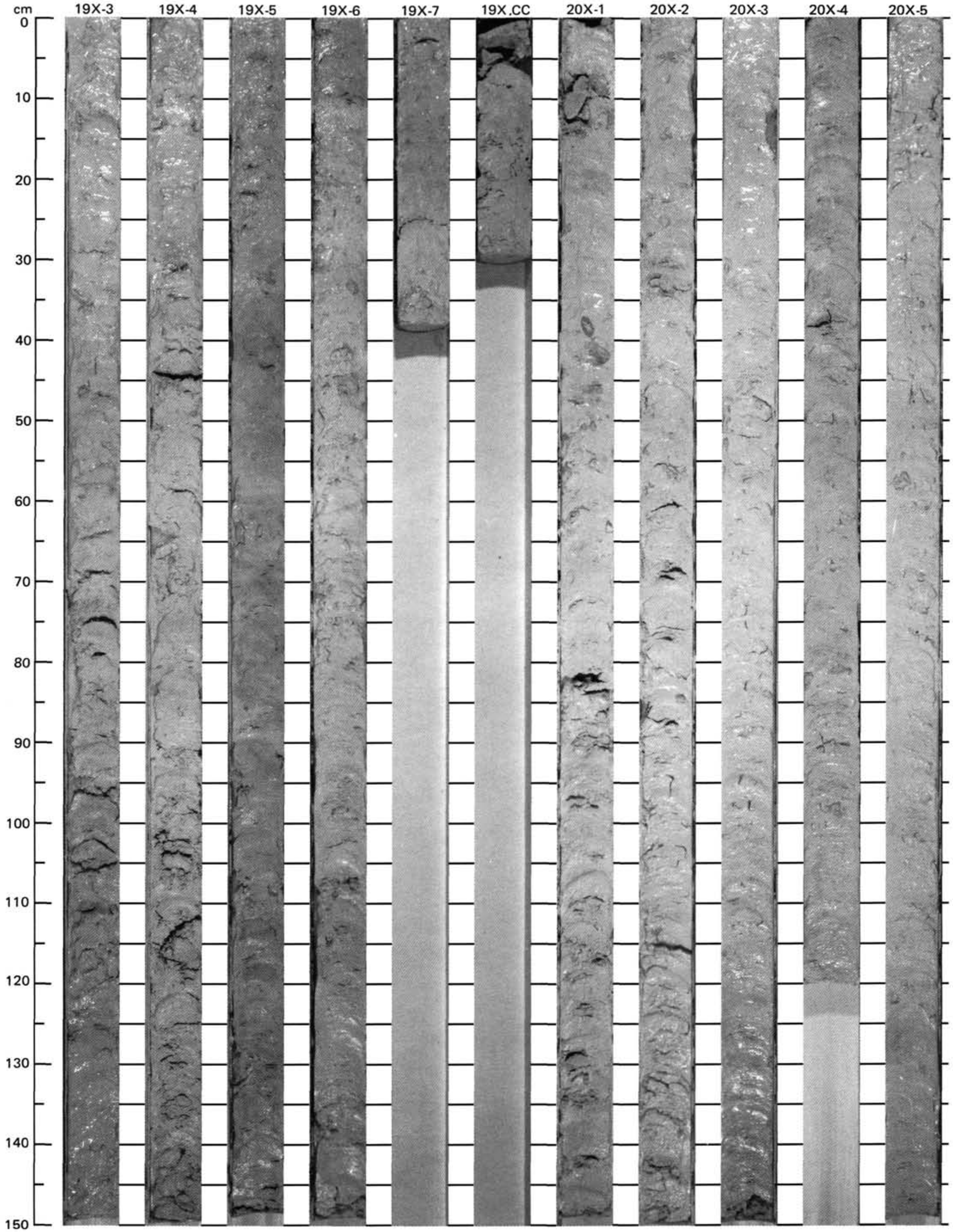
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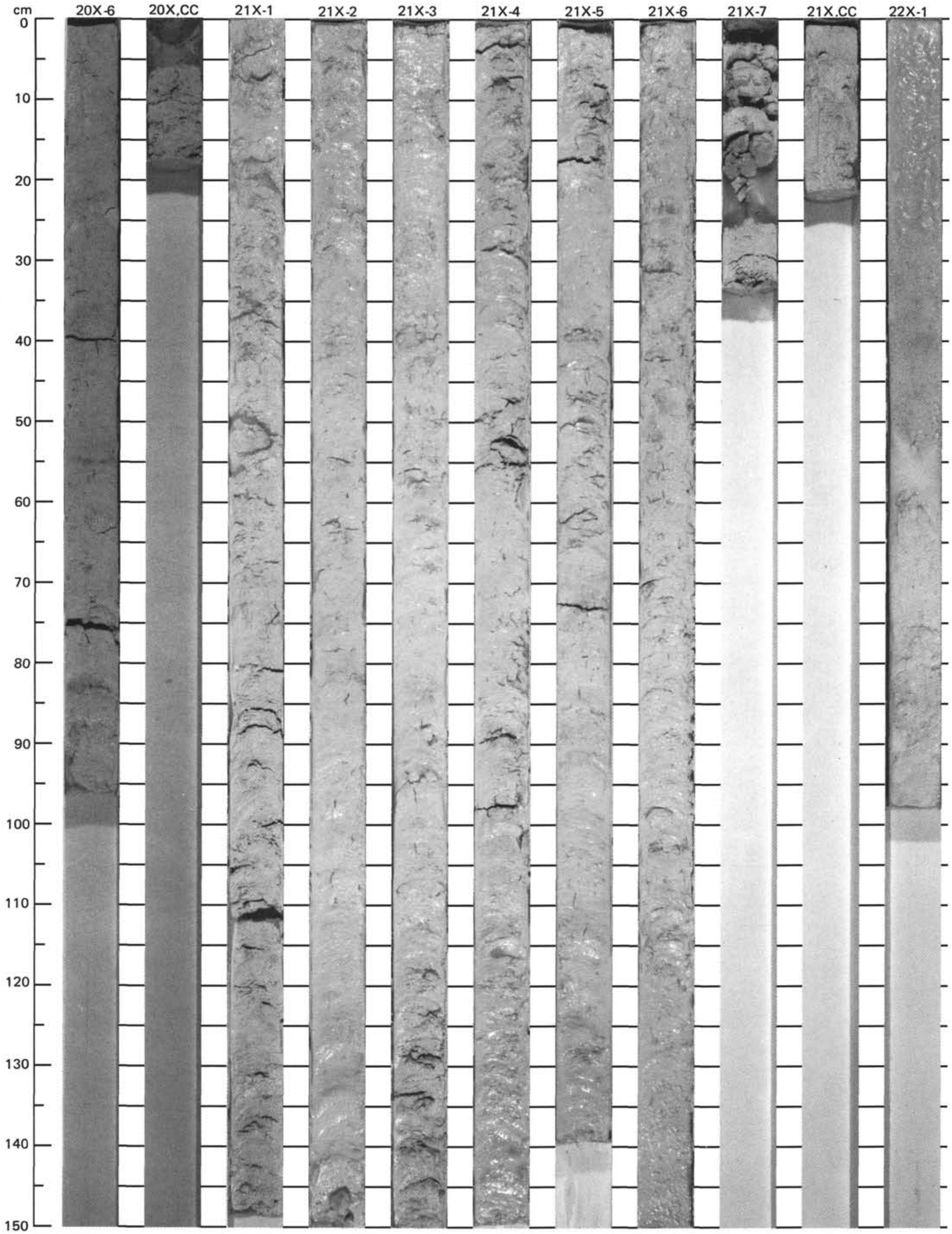
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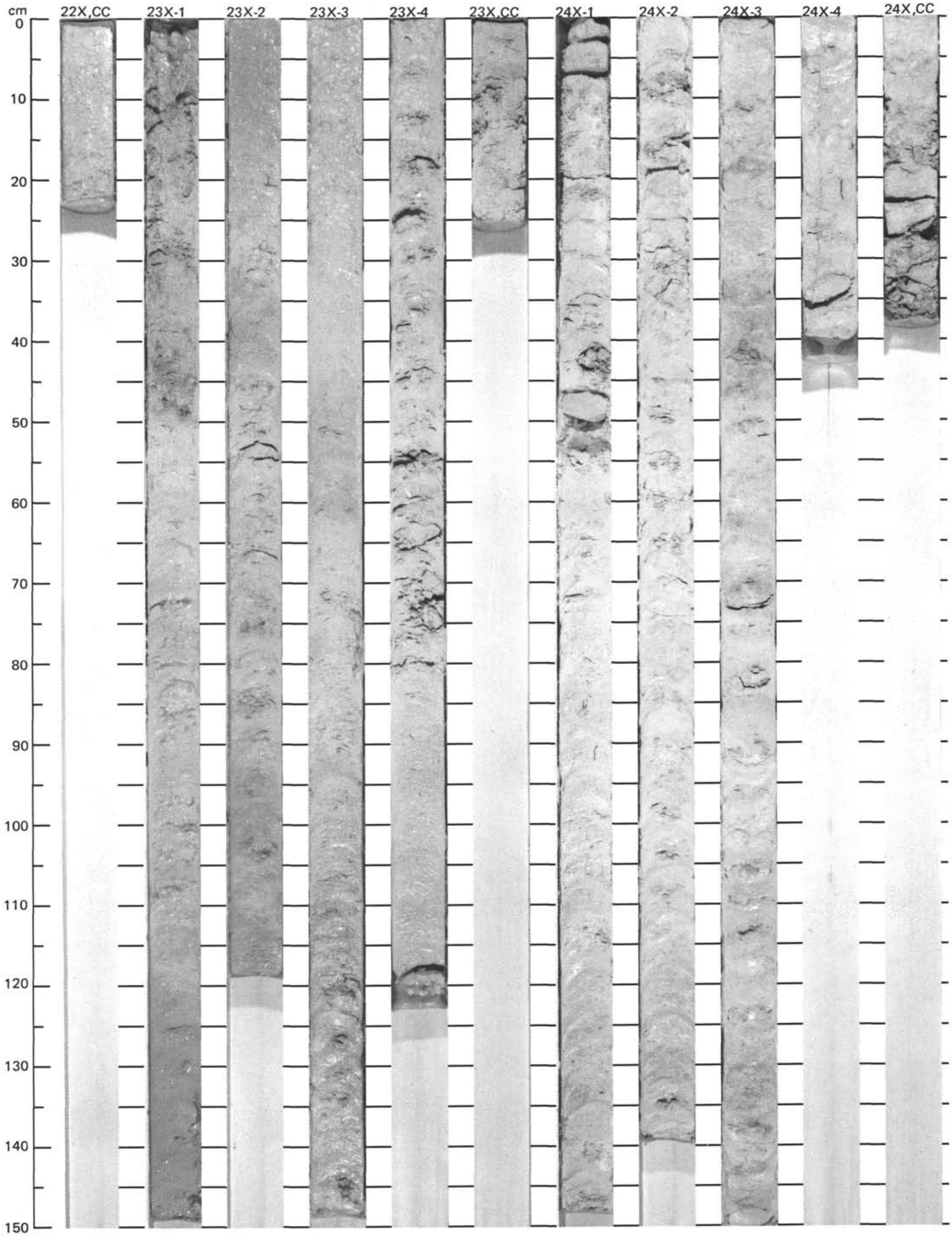
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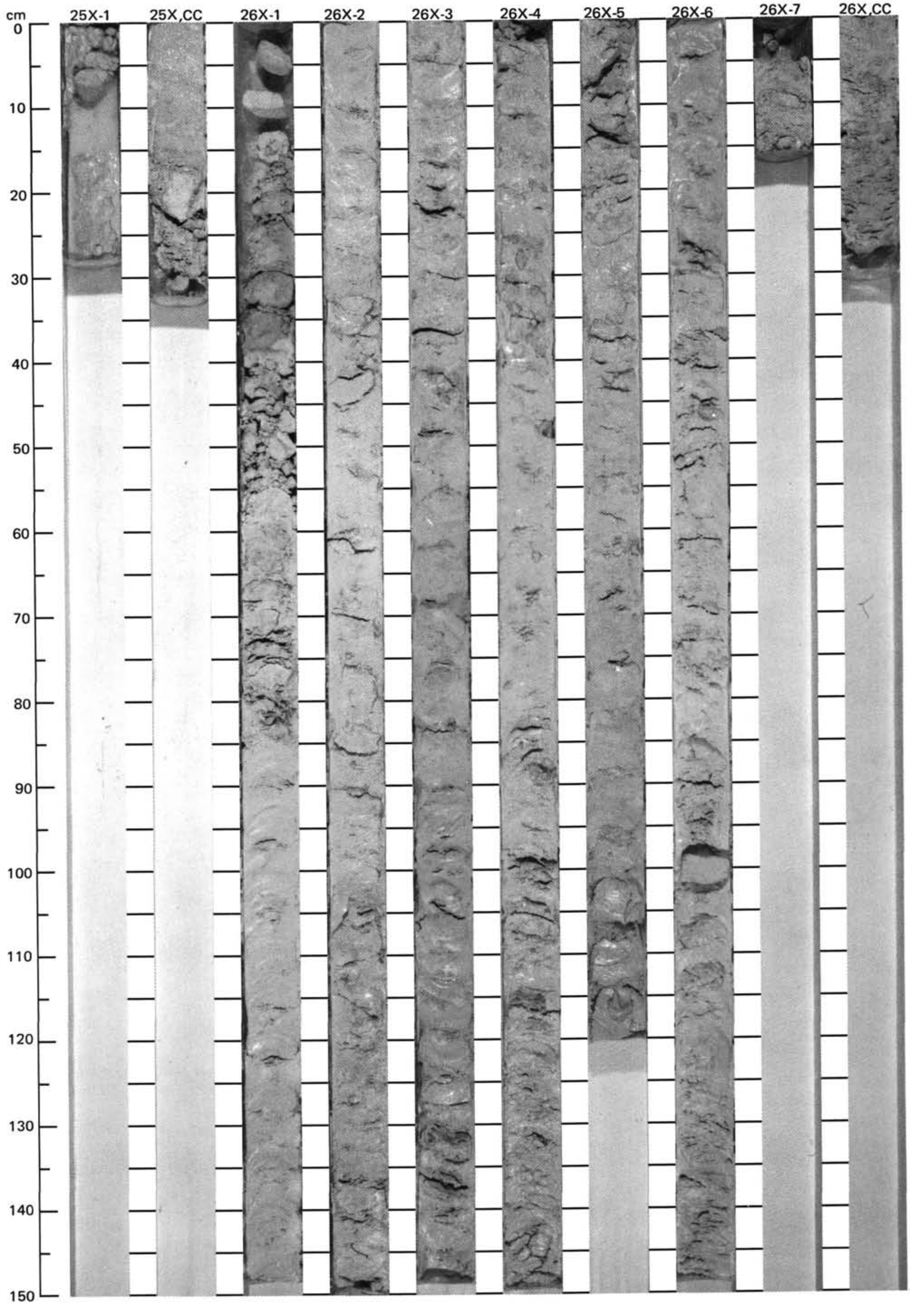
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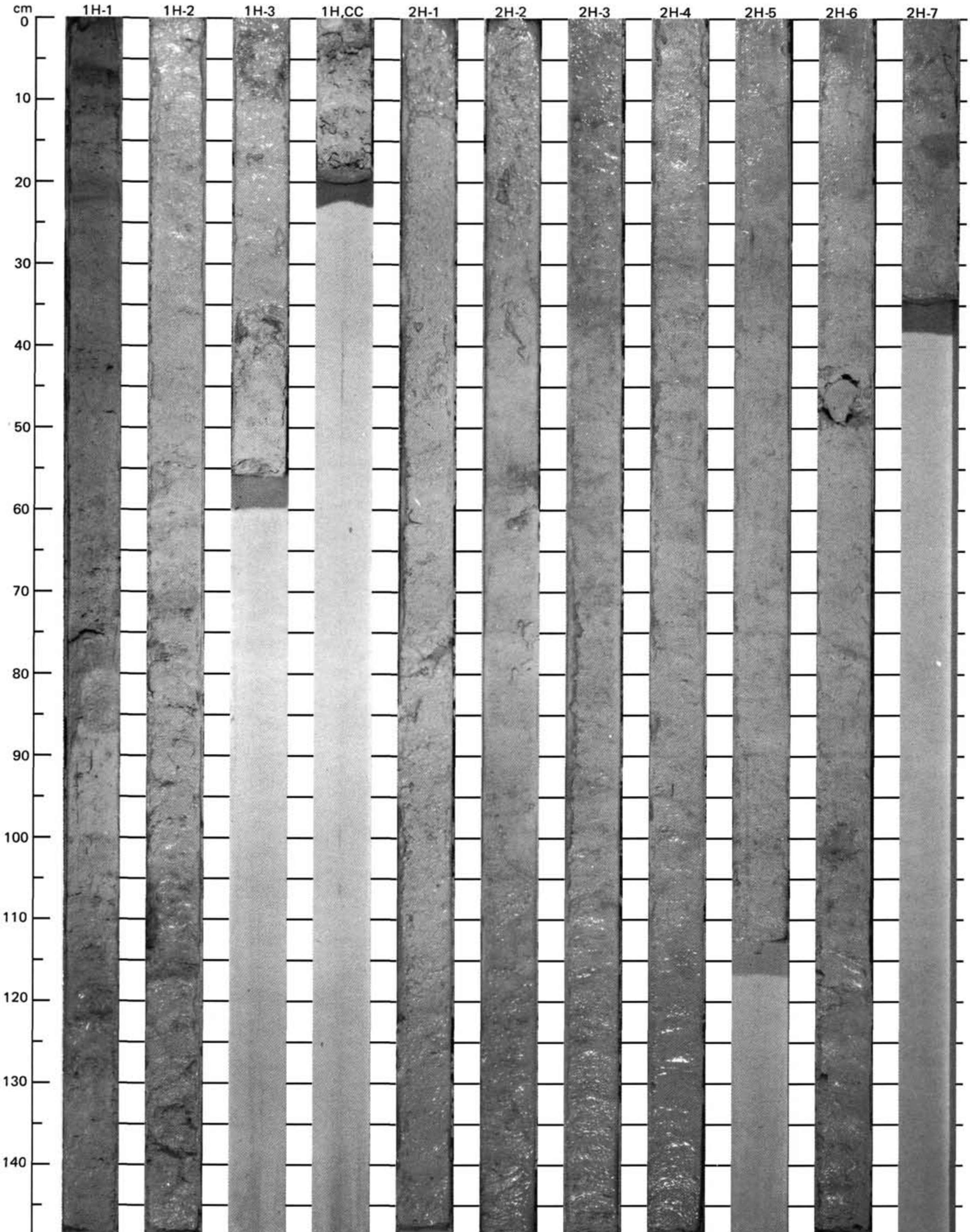
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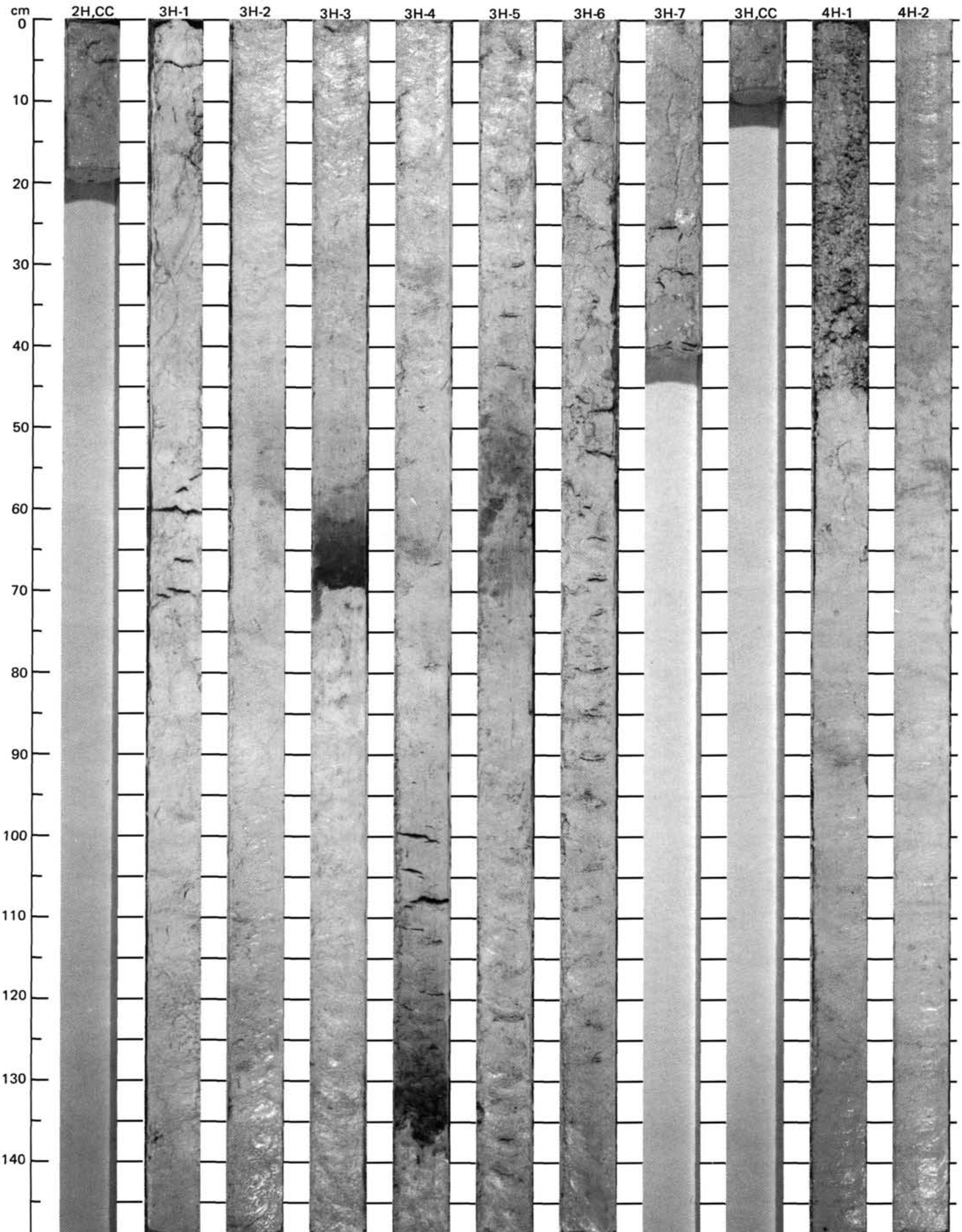
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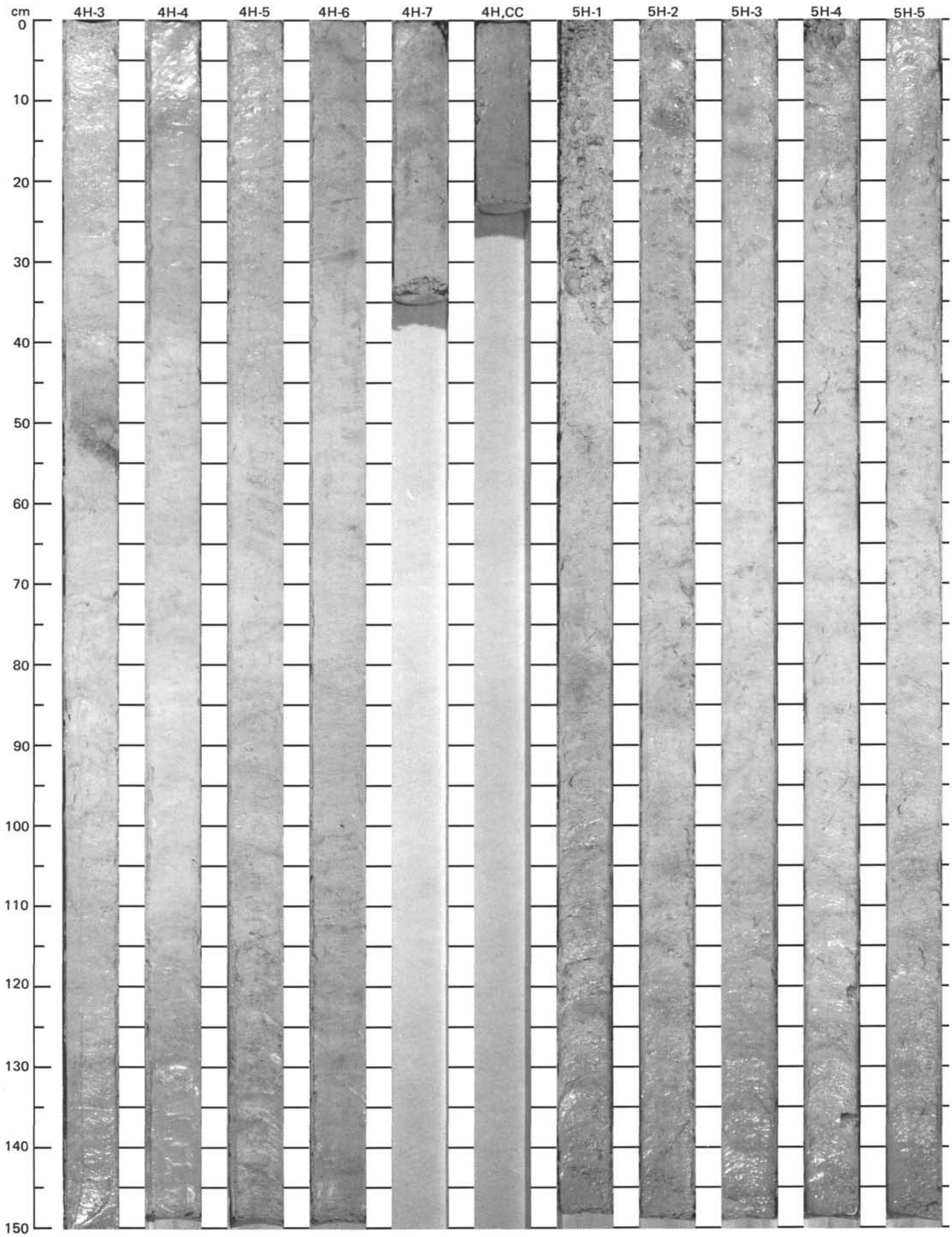
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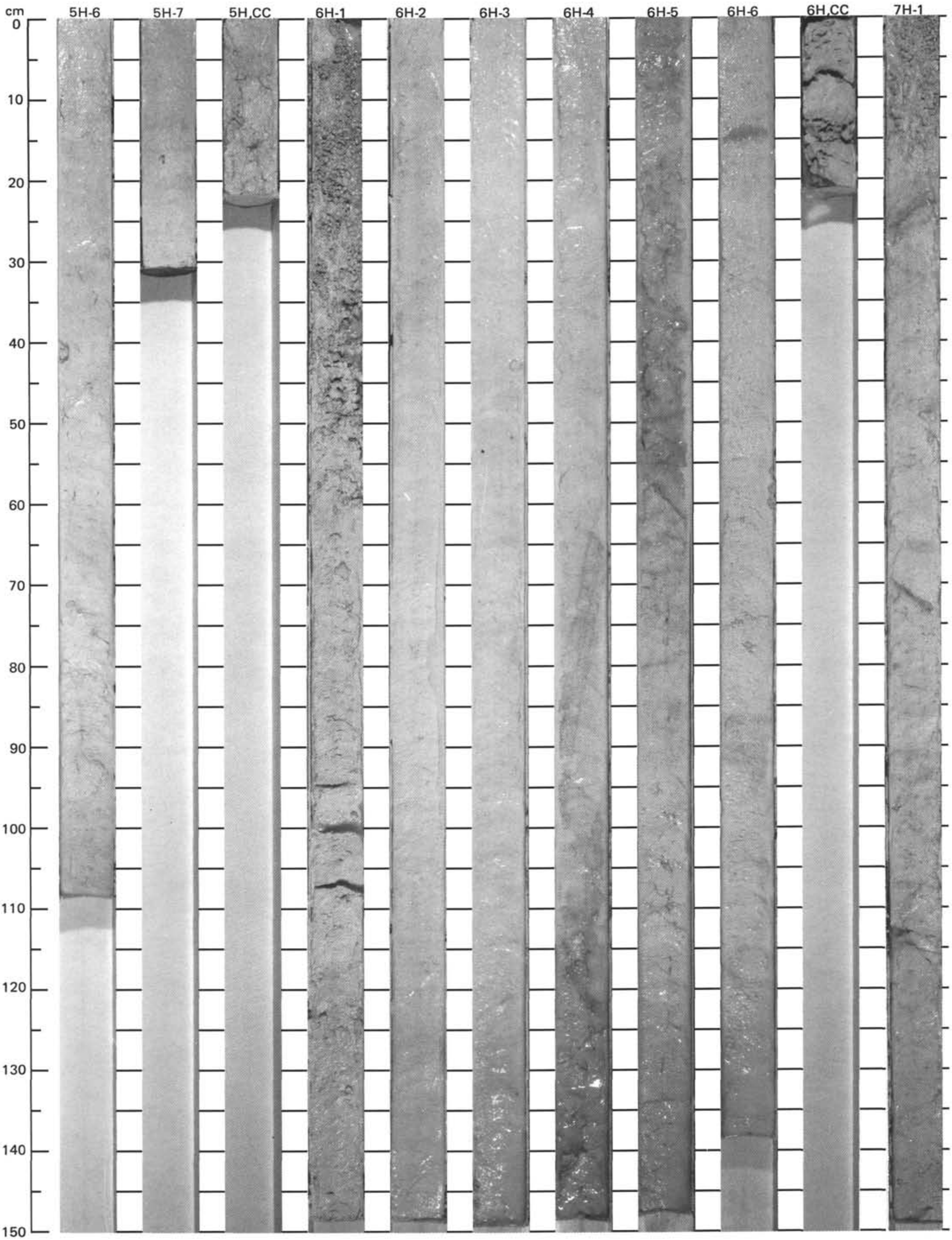
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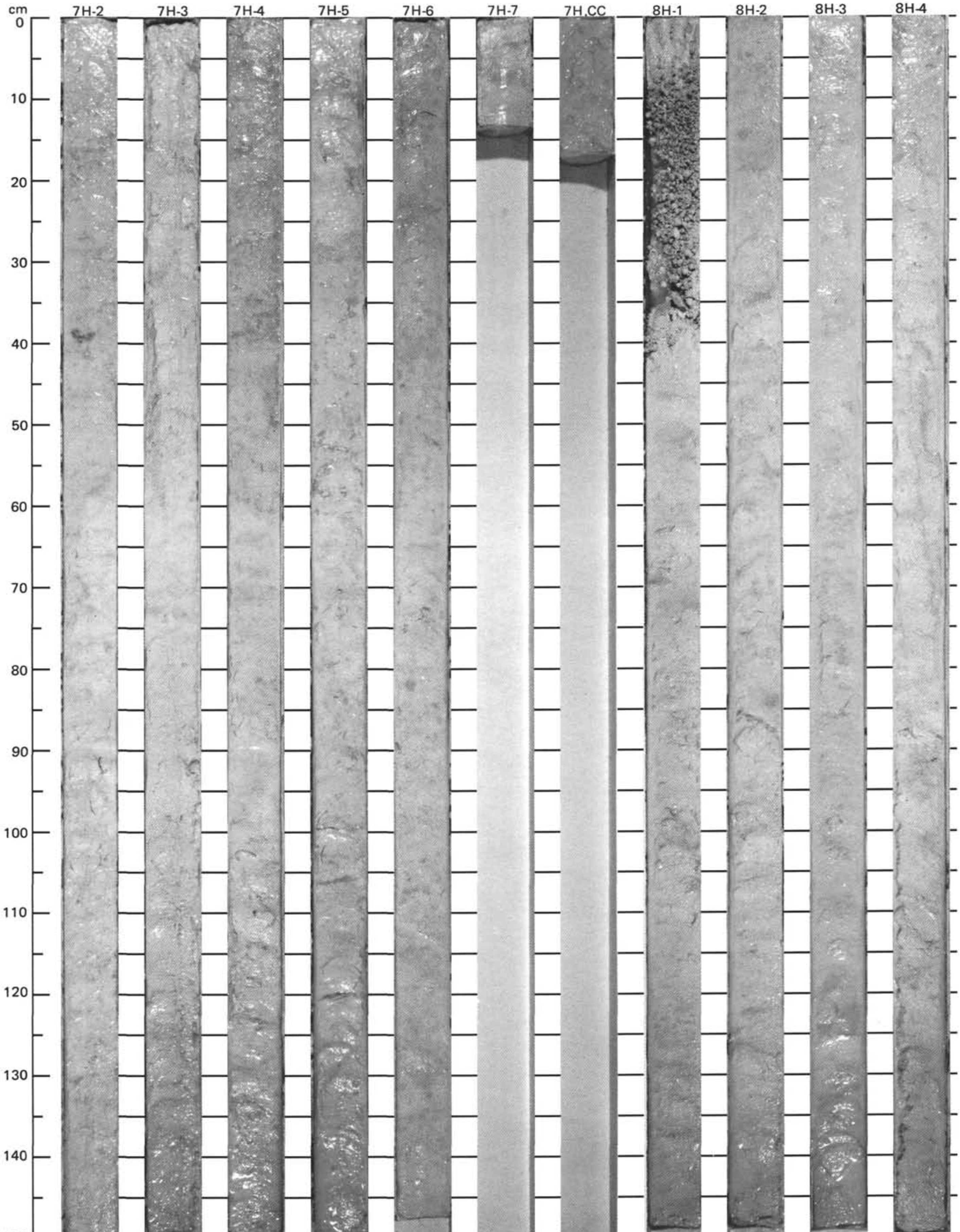
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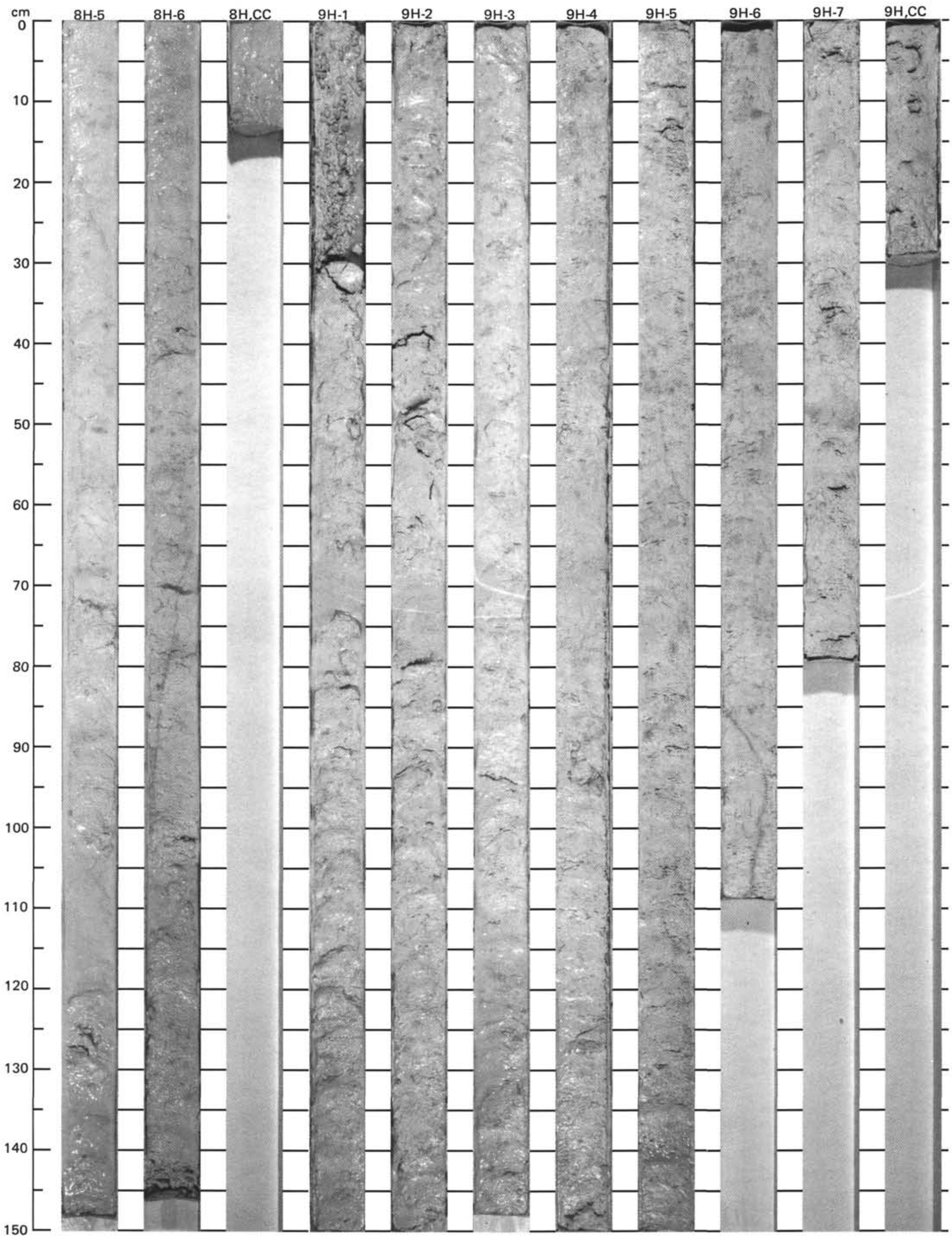
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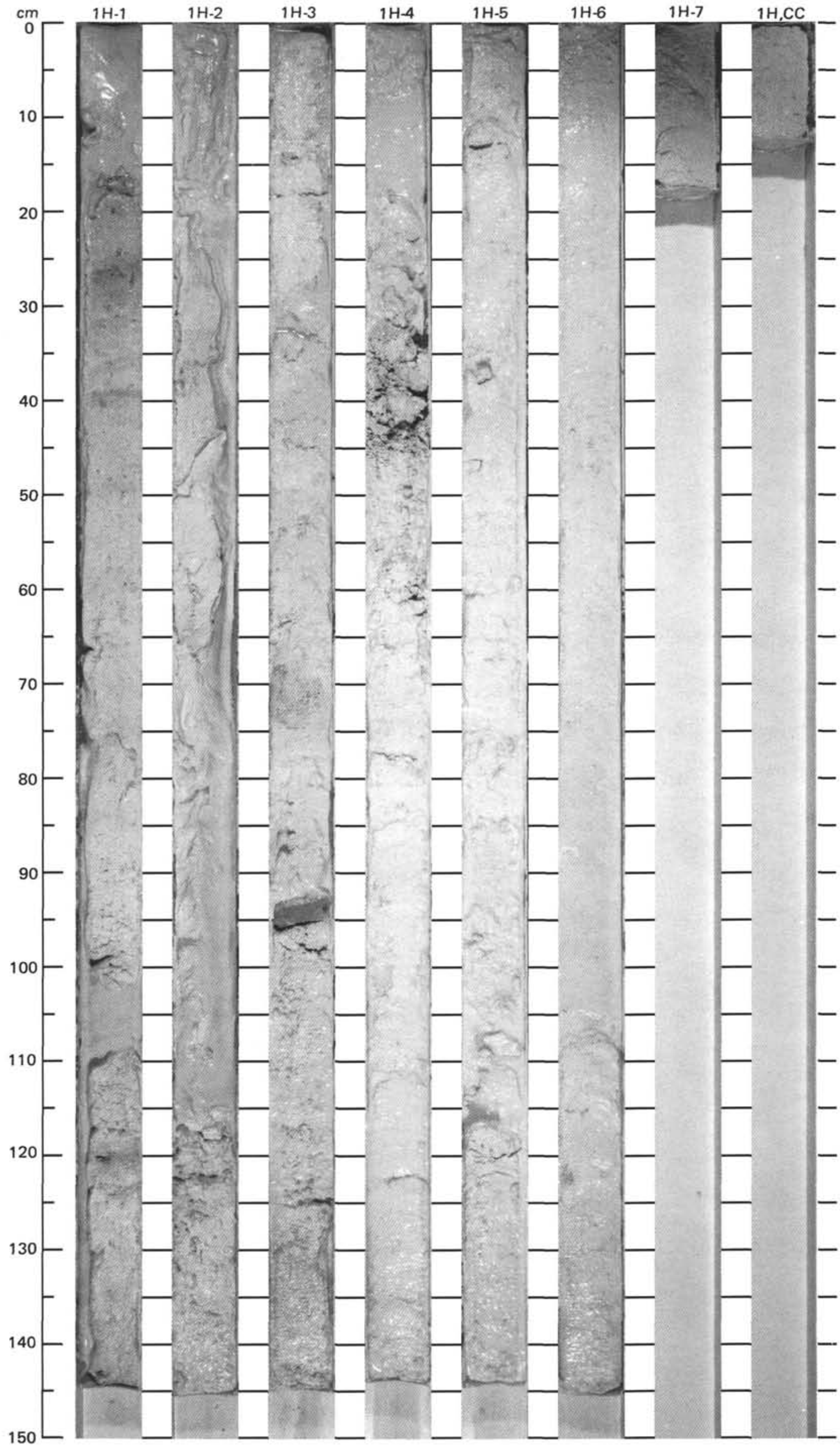
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