7. SITE 269

The Shipboard Scientific Party[1]

SITE DATA

Date Occupied: 17 January 1973

Date Departed: 21 January 1973

Position: 61°40.57'S; 140°04.21'E

Water Depth: 4282 corrected meters (echo sounding)

Water Depth (adopted): 4285 meters (drill pipe from rig floor)

Total Penetration: 958 meters

Number of Cores: 24

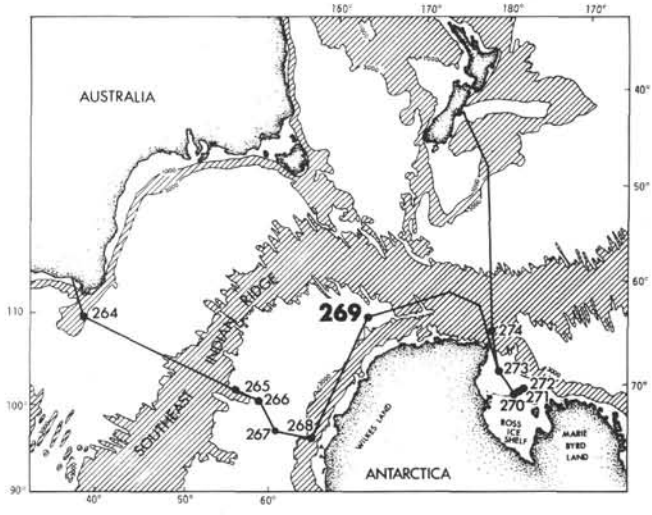
Total Section Cored: 226.5 meters

Total Section Recovered: 94.2 meters

Percentage Core Recovery: 42%

Oldest Sediment Cored:
Depth below sea floor: 958 meters
Lithology: Silty claystone
Age: Middle Oligocene or older

Principal Results: A 958-meter-thick sequence of largely Neogene turbidites and silts deposited by bottom currents were penetrated in two holes at Site 269. The deepest hole bottomed in similar sediments which are at least as old as late Oligocene. Infrequent limy bands provided the only material suitable for dating the sediments, and the lowest of these is located about 50 meters above the bottom of the hole. Ice-rafted sediments are much less obvious here than at Site 268, and pebbles and granules have been observed only in the upper 100 meters of the section. Chert occurs within a 100-meter-long sequence which is poorly dated as lower to middle Miocene, and which, like the remainder of the sediments, is detrital. The youngest chert units coincide roughly with the oldest diatom-rich claystones. Basement was not sampled and is judged to lie 200-300 meters below the deepest penetration here. The inferred average Paleogene sedimentation rates at Site 269 are extremely low.



BACKGROUND

Site 269 lies near the southeastern edge of the south Indian Abyssal Plain in a water depth of about 4170 meters (Figure 1). The total sediment thickness at this site is not known precisely, but is estimated from seismic data to be about 1.4 km. The upper 0.5 sec of sediment cover is characterized by two or three prominent, flat-lying reflectors (Figure 2). The disposition of the lower sediments is unknown.

By extrapolation of magnetic anomaly lineation data from the north, the age of the underlying crust is inferred to be about 50 m.y. (early Eocene). Magnetic lineations in this area are extremely subdued or absent altogether, thus giving rise to a "magnetic quiet zone" similar to that found along the margins of the North Atlantic. The cause of such "quiet zones" is entirely speculative.

The objectives at Site 269 were to investigate the history of sedimentation in an abyssal environment for comparison with Site 268 and to examine the biostratigraphy at a site assumed to be roughly fixed latitudinally throughout its entire history.

OPERATIONS

Site 269 was chosen entirely on the basis of previously acquired geophysical data. The approach to the site position was made on a heading of 080°. The beacon was dropped in 4282 meters of water (PDR corrected) at 1400 on 17 January. Geophysical gear was retrieved and the ship reversed course and returned to the beacon. Positioning in the automatic mode was acquired by 1600 hr.

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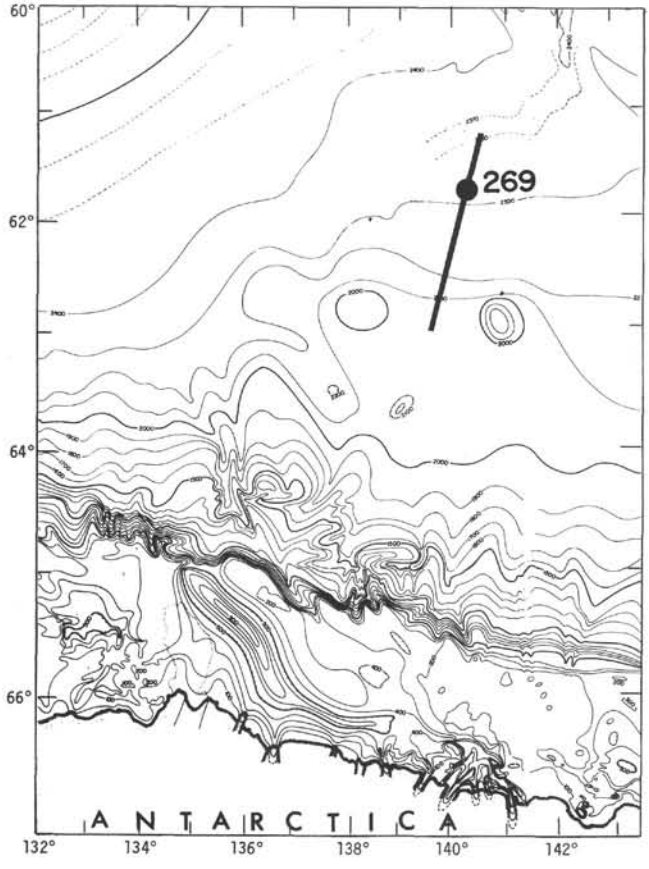


Figure 1. *Location of Site 269 and bathymetry. Contours in fathoms (corrected). Solid line is track line for* Eltanin *53 profile shown in Figure 2.*

While the bottom-hole assembly and drill string were being run, a sonobuoy record was obtained. Although penetration was somewhat greater than that observed in the underway profiling record, most of the energy was returned from numerous reflecting horizons in the first 0.7 sec subbottom. Two weak but discrete reflectors at about 0.95 and 1.25 sec were also observed. By comparison with previous *Eltanin* sonobuoy data, it is likely that the latter of these reflectors represents acoustic basement.

Hole 269 was spudded in at 2315 on 17 January. Drilling with intermittent coring was carried out to a depth of 416.5 meters subbottom by 2045 on 18 January when problems with the ship's roll and pitch compensation components in the dynamic positioning system required that the drill string be pulled out of the hole. Following repairs to the positioning system a second hole, 269A, was spudded in at 0045 on 19 January. This hole was drilled continuously to 416.5 meters subbottom where intermittent coring and drilling was initiated and continued to a subbottom depth at 958 meters. See Table 1. During this period, drilling and coring operations were delayed several hours due to a stripped gear in one of the main hydraulic pumps. Subsequently, the hydraulic motor on the Bowen power sub broke down because of brass filings in the hydraulic fluid, and several hours were lost in its replacement.

Drilling and coring were terminated at 2100 on 21 January when it seemed apparent that because of the slow drilling through hard formations with a presumably badly worn bit, basement would not be reached within the time available. The drill string and bottom-hole assembly were recovered, and the bit brought on deck by 0800 on 22 January. The ship got underway at 0810 hr.

LITHOLOGY

Introduction

The 1-km-thick section cored at Site 269 consists dominantly of silts and clays. Diatom-rich sediments are common in the upper half of the section. In the lower half, diatoms are absent, but calcareous fossils are found in trace amounts.

In this discontinuously cored and relatively uniform section, division into units is rather arbitrary. The abundance and type of microflora have been used to erect the units shown in Table 2. Unit boundaries have been placed halfway between cored intervals. The detrital

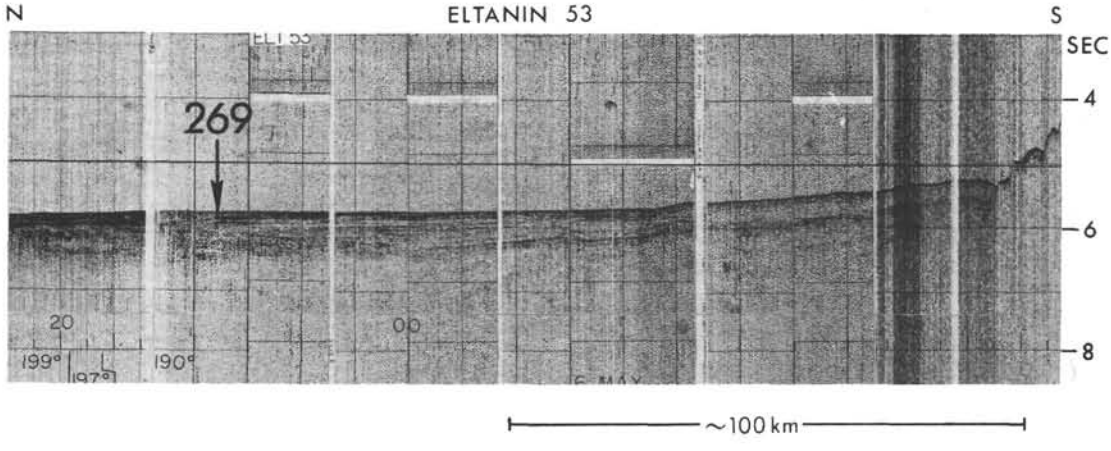


Figure 2. Eltanin *53 acoustic reflection profile across Site 269. Vertical scale is in seconds of two-way reflection time. Location of profile is shown in Figure 1.*

TABLE 1
Coring Summary, Site 269

Core	Date (Jan. 1973)	Time	Depth From Drill Floor (m)	Depth Below Sea Floor (m)	Length Cored (m)	Length Recovered (m)	Recovery (%)
Hole 269							
1	18	0110	4295.0-4293.0	0.0-8.0	8.0	8.0	100
2	18	0310	4341.0-4350.5	46.0-55.5	9.5	3.5	37
3	18	0442	4388.5-4398.0	93.5-103.0	9.5	4.2	44
4	18	0610	4436.0-4445.5	141.0-150.5	9.5	1.1	12
5	18	0737	4483.5-4493.0	188.5-198.0	9.5	0.3	3
6	18	0942	4493.0-4502.5	198.0-207.5	9.5	5.1	54
7	18	1140	4540.5-4550.0	245.5-255.0	9.5	4.0	42
8	18	1320	4588.0-4597.5	293.0-302.5	9.5	0.2	2
9	18	1617	4626.0-4635.5	331.0-340.5	9.5	7.5	79
10	18	1847	4654.5-4664.0	359.5-369.0	9.5	3.1	33
11	18	2329	4683.0-4692.5	388.0-397.5	9.5	1.8	19
Total					103.0	38.8	38
Hole 269A							
1	19	1015	4711.5-4721.0	416.5-426.0	9.5	2.2	23
2	19	1620	4721.0-4730.5	426.0-435.5	9.5	2.2	23
3	19	2115	4768.5-4778.0	473.5-483.0	9.5	2.6	27
4	20	0030	4816.0-4825.5	521.0-530.5	9.5	2.5	26
5	20	0315	4863.5-4873.0	568.5-578.0	9.5	2.3	24
6	20	1010	4901.5-4911.0	606.5-616.0	9.5	3.3	35
7	20	1336	4949.0-4958.5	654.0-663.5	9.5	4.8	51
8	20	1845	4996.5-5006.0	701.5-711.0	9.5	5.2	55
9	20	2143	5044.0-5053.5	749.0-758.5	9.5	3.3	35
10	21	0313	5101.0-5110.5	806.0-815.5	9.5	5.1	54
11	21	0700	5148.5-5158.0	853.5-863.0	9.5	5.1	54
12	21	1245	5196.0-5005.5	901.0-910.5	9.5	9.5	100
13	21	2036	5243.5-5253.0	948.5-958.0	9.5	7.3	77
Total					123.5	55.4	45

TABLE 2
Lithologic Units, Site 269

Unit	Lithology	Subbottom Depth (m)	Unit Thickness (m)	Age
1	Diatom ooze, silty clay diatom ooze, diatom-bearing silty clay, and very fine sand beds	0-~20	5-45	Quaternary (Brunhes and Matuyama)
2	Clay and silty clay, some diatom bearing; silt and very fine sand beds and laminae	~20-~220	~200	Late Miocene to Pliocene (Gauss)
3	Nanno clay, silty clay, clay and diatom clayey silt	~220-270	9-50	Late Miocene
4	Clay and silty clay, some diatom bearing; silt and very fine sand beds and laminae chert	~270-~430	~160	? Early to late Miocene
5	Clay and silty clay with silt laminae. Beds (some graded) of clayey silt, silt, and very fine sand. Some carbonate cementation	~430->958	>528	? Early Miocene and Oligocene

petrology of this site is in many ways intermediate between that at Site 268 and at Site 274. A high pyroxene content suggests some sediment is derived from the Jurassic basalts of Victoria Land. The detailed sedimentology of this site is discussed by Piper and Brisco (this volume). Turbidite sedimentation dominates the site.

Table 3 shows the distribution of several lithologic parameters through the hole.

Unit 1

Diatom oozes make up about half of Unit 1. They are interbedded with diatom-bearing silty clay, and occasional very fine sand beds 5-20 cm thick. The sand beds have sharp bases; some tops are sharp, others grade up into clayey silt. One granitic granule, presumably ice rafted, was found. There is some mottling, but some lithologic boundaries are sharp.

Unit 2

Unit 2 consists mainly of silty clay, usually with 2%-15% diatoms. Diatom ooze is absent. Silt beds and laminae are common. They are not disturbed by bioturbation. The following types of stratification are found in silts.

Simple sharp based graded beds, passing up into clayey silt; or passing up into alternating laminae of silt and clayey silt. These beds are sometimes of very fine sand size at the base. Beds and thick laminae with a sharp base and top, and no visible grading. Alternating laminae of silt and silty clay, with upward decrease in grain size, thickness and frequency of silt laminae.

A single granule, presumably ice rafted, was found in Core 2 (about 45 m subbottom).

Unit 3

Unit 3 consists of diatom-rich nanno clay, diatom silty clay, and diatom clayey silt. It is found in a single core (Core 7), which is badly fractured. Bedding structures are hard to distinguish, and distinct silt beds are absent.

Unit 4

Unit 4 is similar to Unit 2. Recovery of undisturbed core is very low throughout the unit. The dominant sediment is silty clay or clay, usually with 1%-5% diatoms. Silt beds, up to 20 cm thick, and laminae are common. The three types of stratification mentioned in Unit 2 are also found in Unit 4. In addition, a few thin single laminae (<2 mm) of silt are found. Cross-lamination is found in some silt and very fine sand beds.

A little bioturbational mottling (including *Zoophycos*) is recognizable in the lower part of the unit.

In Core 10 (360 m subbottom) and below, both the sandy silt and the silty clay-clay lithologies are in places lithified to form porcellaneous chert. All degrees of lithification, from unaltered sediment to cherts with conchoidal fracture, are found, sometimes in the same hand specimen.

Unit 5

Unit 5 consists of silty clay and clay, with beds and laminae of silt, silty clay, and very fine sand. The unit is almost barren of microfossils, but trace quantities of

TABLE 3
Distribution of Sediment Components at Site 269

Core	Diatoms	Nannos	Lithified Sediment Chert	Lithified Sediment Carbonate Cement	Sand and Coarse Silt Beds	Granules	Lithification
1	Ooze	–	–	–	P	P	Soft
2	P	–	–	–	P	P	Stiff
3	P	–	–	–	P	–	Stiff
4*	P	–	–	–	–	–	Stiff
5*	P	–	–	–	–	–	Stiff
6	P	–	–	–	P	–	Stiff
7	P	Ooze	–	–	–	–	sl/st
8*	P	–	–	–	–	–	sl/st
9	P	–	–	–	(P)	–	sl/st
10	P	–	P	–	P	–	sl
11	P	–	P	–	–	–	sl
1A	P	–	P	–	P	–	sl
2A	T	P	(P)	P	P	–	sl
3A	–	–	–	–	–	–	sl
4A	–	P	–	P	–	–	sl
5A	–	–	–	–	–	–	sl
6A	–	T	–	P	P	–	sl
7A	–	T	–	P	P	–	sl
8A	–	T	–	P	P	–	sl
9A	–	–	–	P	P	–	sl
10A	–	T	–	–	P	–	sl
11A	–	–	–	P	P	–	sl
12A	–	T	–	P	P	–	sl
13A	–	T	–	P	P	–	sl

Note: P = present, T = present in trace amounts, – = absent, st = stiff, sl = semilithified, * = less than 1.5 m recovered.

calcareous nannofossils are found throughout the unit, and two foram assemblages have been recovered. No siliceous microfossils have been found.

A few silt, and less commonly, mottled silty clay, beds are cemented with carbonate. Some of the beds have up to 5% calcareous nannofossils. Cherts are absent. The whole unit is "semilithified," in that it must be cut on the band saw, but it approaches "lithified" in character. Water content of claystone at the base of the section is as low as 14%. Recovery and preservation of sedimentary structures are excellent in the lower part of the unit. These structures are discussed in detail in this volume and suggest the sediments are turbidites.

PHYSICAL PROPERTIES

Wet-bulk densities using the GRAPE technique were measured on one or more sections from most of the cores in Holes 269 and 269A. A couple of additional determinations of wet-bulk density and porosity were obtained from syringe samples. Sonic-velocity measurements were made on nearly all cores. Representative data are plotted in Figure 3. Most of the sonic-velocity measurements for Cores 1 through 10 were made on unsplit sections while those for Cores 11 and 1A through 13A were made on split sediment chunks.

From the sediment-water interface to the maximum depth of penetration (958 m subbottom), estimated means of the sonic velocity and wet-bulk density increase from about 1.50 to 2.25 km/sec and from about 1.30 to 1.95 g/cc, respectively. This represents a range of acoustic impedance from about 2.0 to 4.5 $\times$ 10^5 g/cm^2 sec. All of these parameters are also, however, extremely variable with individual cores and sections of cores. For example in Section 6 of Core 1 the ranges in ρ_B, V, and $A.I.$ are 1.45-2.10 g/cc, 1.49-1.78 km/sec, and 2.15-3.75 g/cm^2 sec. Most of the observed variations appear to correlate with compositional and lithification variations within the cored sediments.

Whenever possible, sonic-velocity measurements on split sediment chunks were made both normal and parallel to the bedding. Velocities parallel to the bedding were consistently higher usually by 5%-10%.

Interstitial water samples were taken only in the upper 340 meters of Site 269. Routine analyses show no correlation with lithology. Alkalinity and salinity decrease slightly down the hole; *p*H increases slightly. Alkalinity is unusually low, between 2.05 and 3.03 meq/kg.

BIOSTRATIGRAPHIC SUMMARY

The sediments cored in Holes 269 and 269A are typified by their generally low content of microfossils. The sediments contain virtually no calcareous microfossils. Occasional foraminifera and coccolith faunas are found in isolated horizons but assemblages are usually poorly preserved and contain only a few specimens and species. Silicoflagellates are present in the post-Miocene

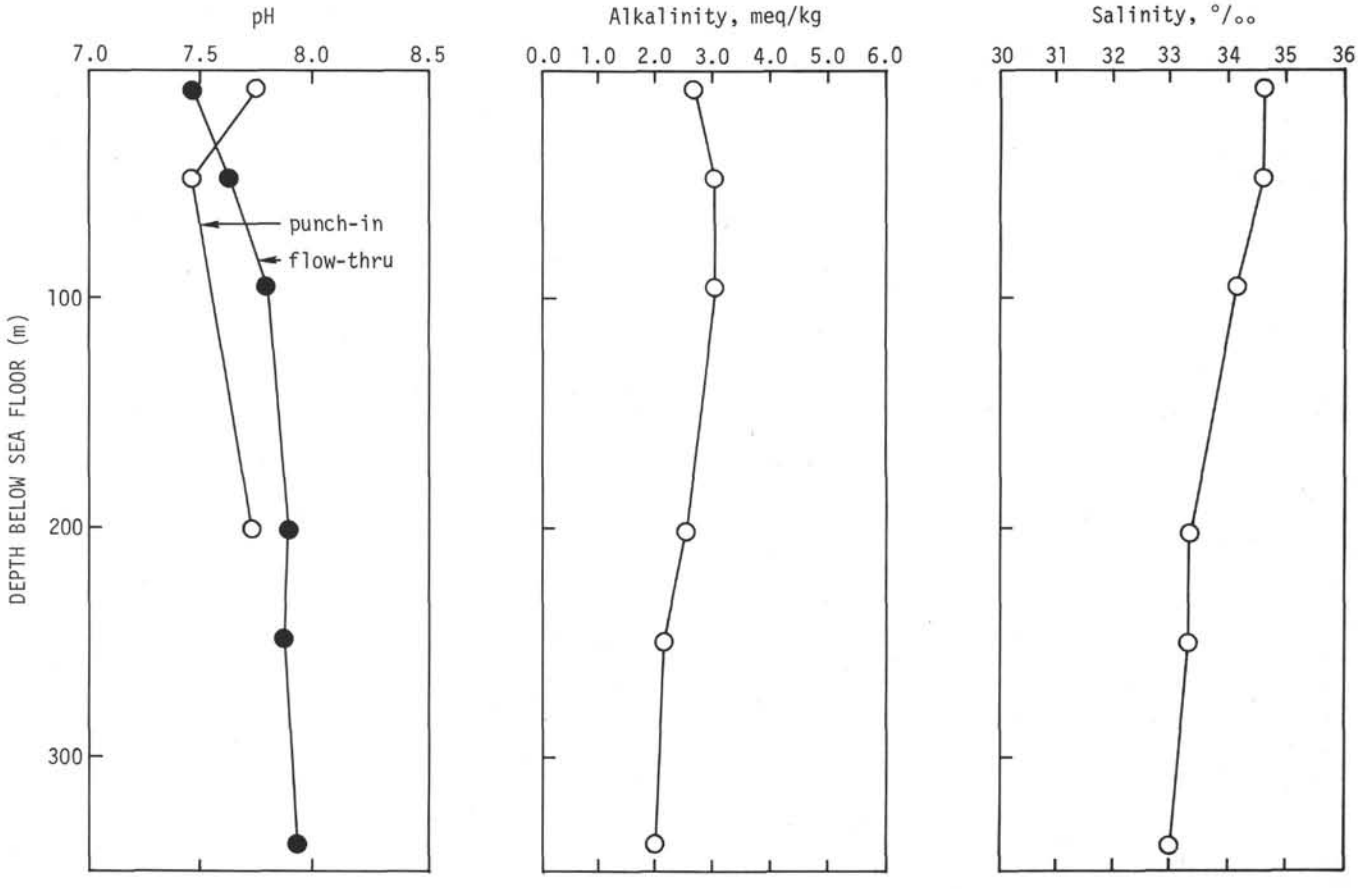


Figure 3. *Shipboard measurements of* pH, *alkalinity, and salinity in sediment pore waters at Site 269.*

sediments (Cores 1-3). Radiolaria and diatoms are present in the mid-Miocene to Pleistocene sediments (Cores 1-9) and are more abundant in the post-Miocene sediments. Below Core 9 siliceous microfossils are absent.

As at the previous Sites 265-268, the mid-Miocene to Pleistocene sediments which contain siliceous microfossils must have been formed beneath a water mass similar to that of the present Antarctic water. Their low abundance of siliceous fossils can be attributed to the admixtures of clastic debris from adjacent continents. However, unlike the previous sites, there is no downward change from siliceous to calcareous lithology beneath Core 9. The absence of siliceous and very rare occurrence of calcareous microfossils in the pre-mid-Miocene sediments can be explained by the effects of high input of terrigenous materials, diagenetic changes indicated by the presence of chert and carbonate cement in several horizons, effects of solution process, or a combination of them.

FORAMINIFERA

Foraminifera were obtained from two samples at Site 269; the remainder of the section is barren due to carbonate dissolution, probably accentuated by a large amount of dilution by terrigenous material.

Core 7A (Section 2, 54-56 cm) contains a fauna containing *Catapsydrax unicavus* of late(?) Oligocene to early Miocene age, including two specimens of *C. unicavus* and a badly corroded specimen of *C. dissimilis*.

Core 12A (Section 5, 71-75 cm) contains a *Globigerina ampliapertura* Zone fauna of Oligocene age identified on the basis of three specimens of *G. ampliapertura* and several specimens of *Catapsydrax* sp. All evidence, however, indicates that the foraminifera from this sample are reworked and thus provide only a lower age limit to the enclosing sediments.

The foram-bearing sediment of this sample is a light gray quartzose, sandy mud, distributed as blebs and discontinuous irregular patches (probably burrow fillings) through a thickness of about 2 cm in the enclosing dark gray claystones. The foraminifera are abraded and fragmented and the chamber filling of several specimens contains a bright reddish material (probably hematite) indicating oxidizing conditions in the source beds as opposed to the reduced state of the in situ sediments. Thus, it appears that this sample represents a bioturbated clastic bed from a shallow source on the continental shelf or slope.

Nannofossils

At Site 269 the occurrence of nannofossils in the sediments is rare and sporadic. Only three horizons contained sufficient nannofossils for analysis of the population and of these only two contained species which afforded an age. Those nannofossils present are rare and poorly preserved. Core 6, Section 2 (Site 269A) contains a few battered specimens of *Discoaster deflandrei*, suggesting a lower Miocene age and Core 12, Section 5 (Site 269A) contains *Sphenolithus moriformis* and *Reticulofenestra bisecta*, suggesting a mid Oligocene age. The rest of the cores were generally barren of nannofossils.

The rare occurrence and poor preservation of nannofossils in the cores suggest that the two dated assemblages may be reworked. The lowest (mid Oligocene) date may therefore represent only a maximum age for the containing sediment.

Radiolaria

Radiolaria are few to common and well preserved in post-Miocene sediments, and sparse, moderately preserved in upper Miocene sediments. Pre-upper Miocene sediments contain no Radiolaria.

The Miocene/Pliocene boundary is located in the coring gap between Cores 3 and 4. Two radiolarian zones are recognized at this site: the *Helotholus vema* Zone (Cores 2-3), and the *Theocalyptra bicornis spongothorax* Zone (Cores 3-7). Based on a few Radiolaria that occur at several horizons, Cores 8 to 1A are of Miocene age. Core 2A and below contain no Radiolaria. No reworked older Radiolaria are encountered in any of the samples studied.

Diatoms

Diatoms only occur in Cores 1 through 9 at Site 269. Cores 10 through 11 and all of Hole 269A are barren. The abundance of diatom frustules varies from common (Core 1) to poor (Cores 2-9). Preservation varies in a like manner.

Core 1 above 1-5, 130 cm contains the *Coscinodiscus lentigenosus* Zone, below this point in Core 1 is a portion of the *Coscinodiscus elliptipora/Actinocyclus ingens* Zone. Core 2 contains a portion of the *Nitzschia interfrigidaria* Zone. Core 3 contains a portion of the *Nitzschia praeinterfrigidaria* Zone and the *Denticula hustedtii* Zone. This assignment is based on meager evidence and is questionable. Cores 4, 5, and 6 through 6-4, 140 cm contains a portion of the *Denticula hustedtii/Denticula lauta* Zone. The remainder of Core 6 through Sample 8, CC contains a portion of the *Denticula lauta/Denticula antarctica* Zone. Below this point through Core 9 is a portion of the *Denticula antarctica/Coscinodiscus lewisianus* Zone.

Silicoflagellates

Silicoflagellates are abundant and well preserved throughout Core 1 at Site 269. Between Core 1 and Core 6 floral abundance and preservation decreases sharply. Cores 7 through 11 of Site 269 and all sediments from Hole 269A are barren of silicoflagellates.

Core 1 contains the *Distephanus speculum* Zone A which is within the Brunhes and Matuyama magnetic epochs. Low abundances of silicoflagellates in Core 2 makes a zonal assignment difficult; however, this assemblage in low abundance is usually present in sediments deposited during the upper Gauss magnetic epoch. Sample 3-1, 60 cm through 3-3, 82 cm is within the *Dictyocha pseudofibula* Zone which is confined to the interval between Gilbert event "A" (3.70 m.y.) and Gilbert event "B" (3.92 m.y.). The lowermost sample examined in Core 3, 3-3, 130-132 cm, is probably assignable to the upper *Mesocena diodon* Zone (Gilbert event "B" through epoch 5). The silicoflagellates rarely occurring in Cores 4, 5, and 6 do not allow an age assignment for this interval.

Palynology

Thirteen samples from this site were macerated and examined for acid-insoluble microfossils: i.e., Core 9 from Site 269, and Cores 1, 2 (2), 3, 6-13. It was hoped that recovery of palynomorphs might contribute to the solution of dating problems in Units 4 and 5. Spores, pollen, and microplankton, however, were very sparse, due possibly to excessive dilution of terrigenous material, and hence of no value in age determination. Most samples yielded leiospheres, of simple morphology; recycled Permian spores occur in unusual abundance, including forms such as *Verrucosisporites pseudoreticulatus*, which occurs in late Sakmarian-Artinskian strata in Australia. Tertiary pollen is extremely rare, represented only by a few Nothofagidites grains. Core 9 of Hole 269A yielded several specimens of the late Eocene-early Oligocene dinoflagellate *Deflandrea macmurdoensis*, which are probably recycled.

SUMMARY AND CONCLUSIONS

Site 269 lies near the southeastern margin of the south Indian Abyssal Plain in a water depth of 4285 meters. On-site sonobuoy data indicate that the sediments present are more than 1.3 km thick; total penetration of 958 meters reached sediments of Oligocene-early Miocene age, much younger than the estimated basement age of early Eocene.

The section at Site 269 consists dominantly of silts and clays deposited on an abyssal plain. Diatom-rich sediments are common in the upper half but lacking in the lower, where calcareous nannofossils are found in trace amounts. The modes of sedimentation include hemipelagic settling of fine debris, turbidity currents and probable contour currents (Piper and Brisco, this volume) and these processes appear to have been active since at least the early Miocene. Thus, the depositional environment has been characterized by influxes of material up to fine-sand size from the adjacent continent. However, there appears to have been little contribution from floating icebergs, except recently, as the only large granules and pebbles occur in the top of Core 2, probably of Gauss age. It is not certain that these clasts were in situ.

A rough transition from diatomaceous deposits above to nannofossil bearing strata below occurs in the middle Miocene (between Cores 6 and 7). Microfossil abundance is so low, however, so that the paleoclimatic significance of this lithologic transition is difficult to assess.

Cherts at Site 269 are restricted to the interval between about 360 and 430 meters. Their age, based on downward extrapolation of the sedimentation rate, is entirely middle Miocene, the same as the thin chert bed recovered at Site 267. Chert at Site 269 is associated with silty clays and clays which bear small quantities of diatoms, and chertification apparently represents a stage of lithification of these sediments, during which silica was derived from diatom frustules.

Sedimentation rates for middle Miocene and younger sediments range from ~14 to ~68 m/m.y., and based on an indicated low rate of less than 1 m/m.y. in Core 1, an unconformity is tentatively suggested there, within the Matuyama section.

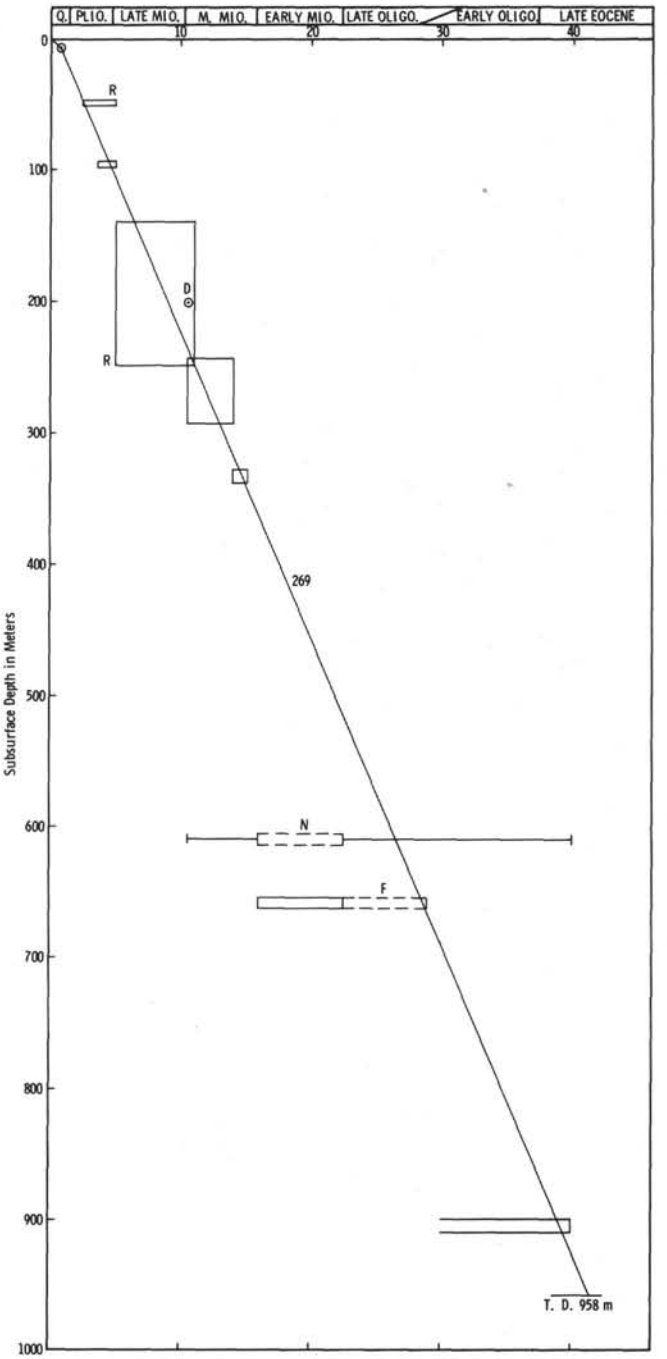


Figure 4. *Age vs. depth at Site 269.*

The average sedimentation rate for the approximately 400 meters or less of sediments lying below the deepest penetration can be estimated using the inferred crustal age from sea-floor spreading studies. This rate of 1-2 m/m.y. is very low considering the proximity of Site 269 to the continent and associated terrigenous sediments. The inference on Paleogene sedimentation rates is in marked contrast to that at Site 268. The thin unsampled portion of the Paleogene section at Site 269 probably reflects one or more major unconformities.

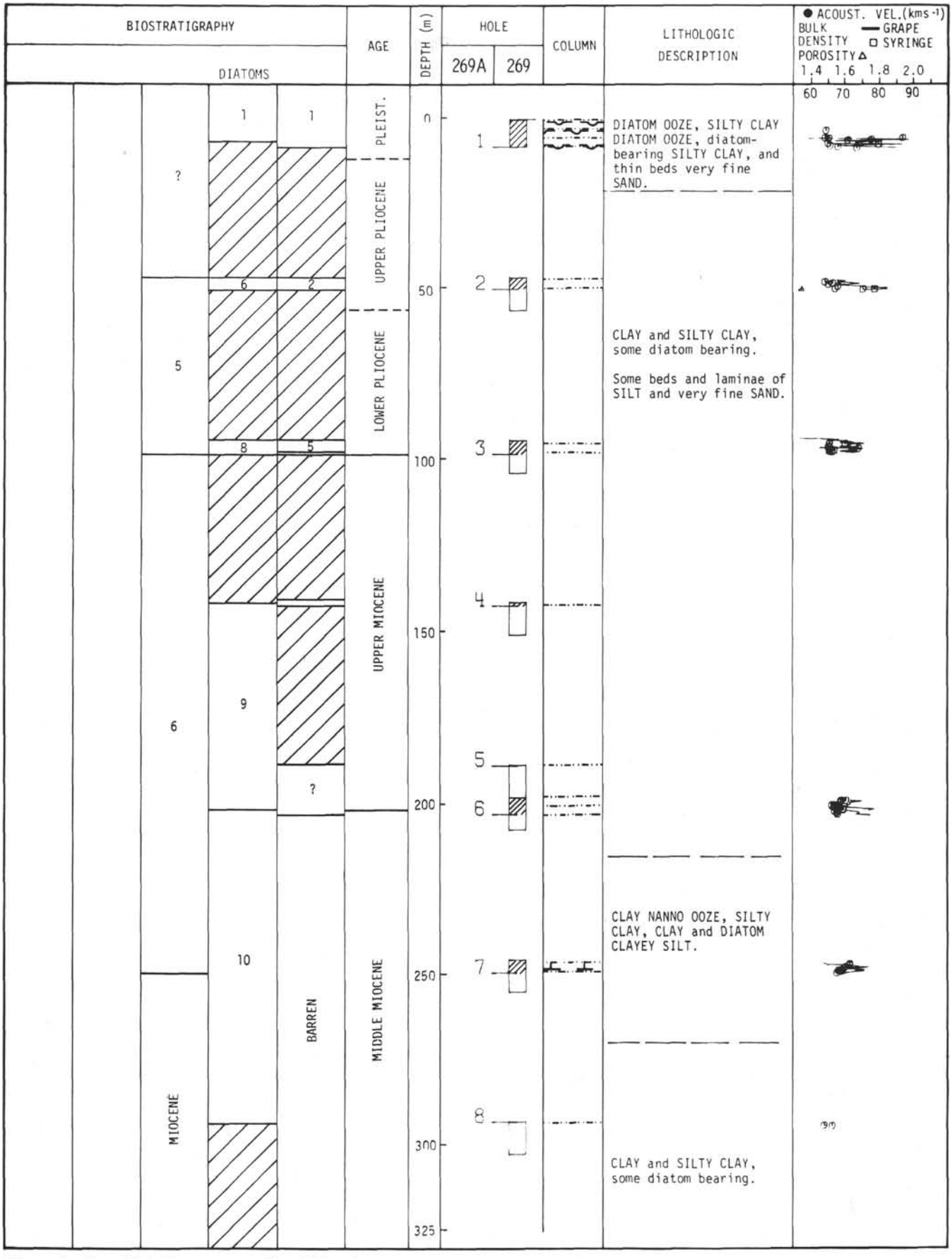


Figure 5. *Graphic hole summary, Site 269.*

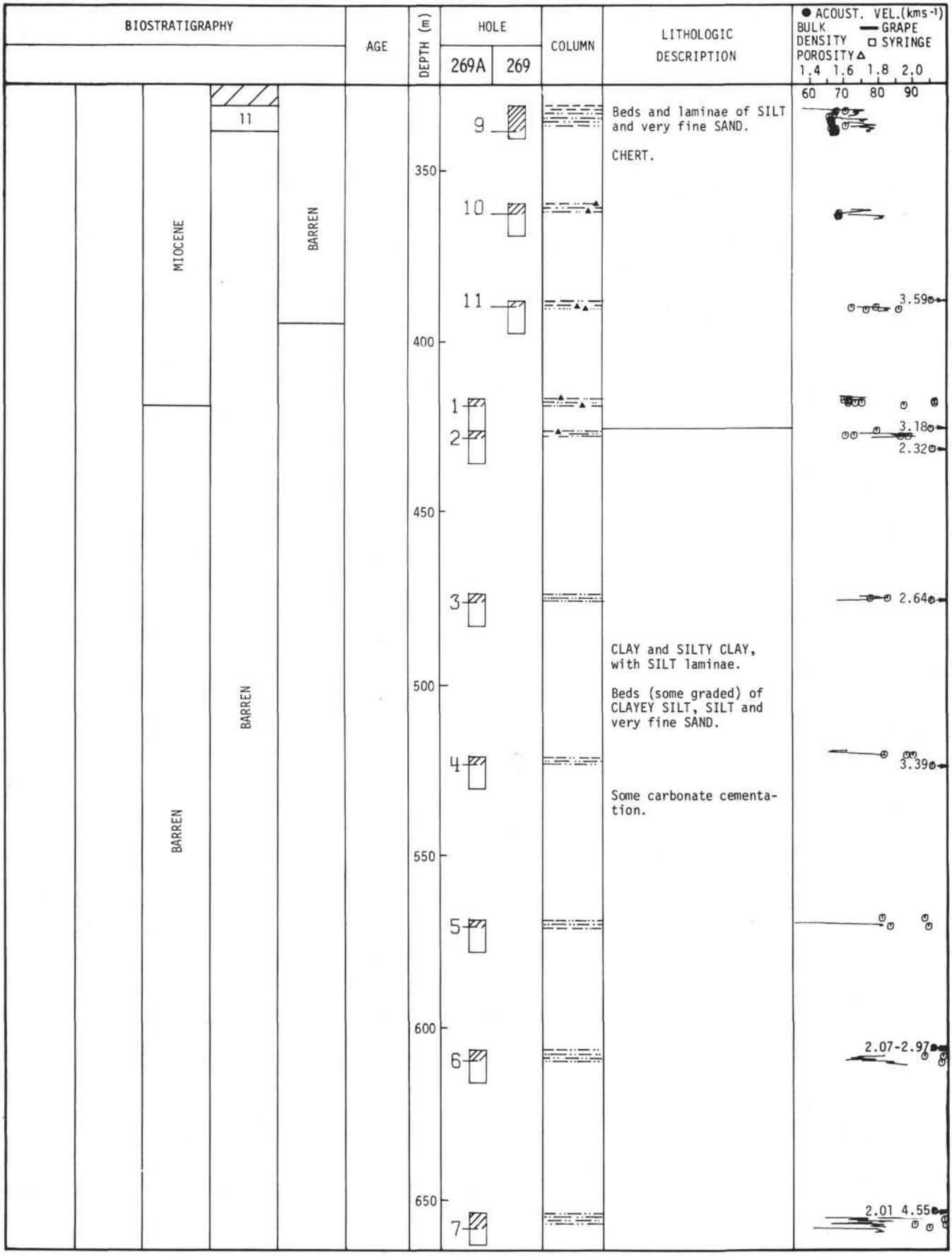


Figure 5. *(Continued).*

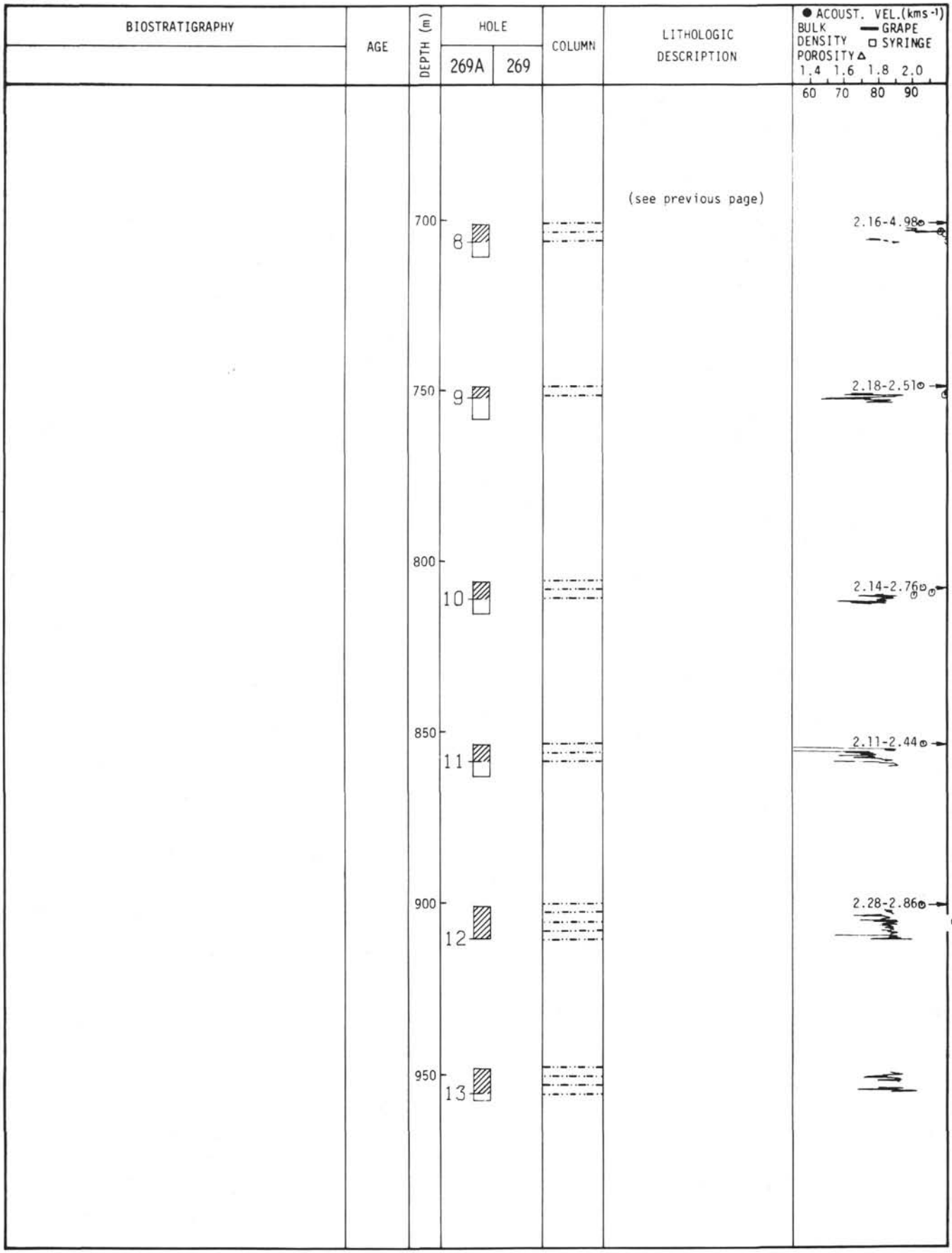
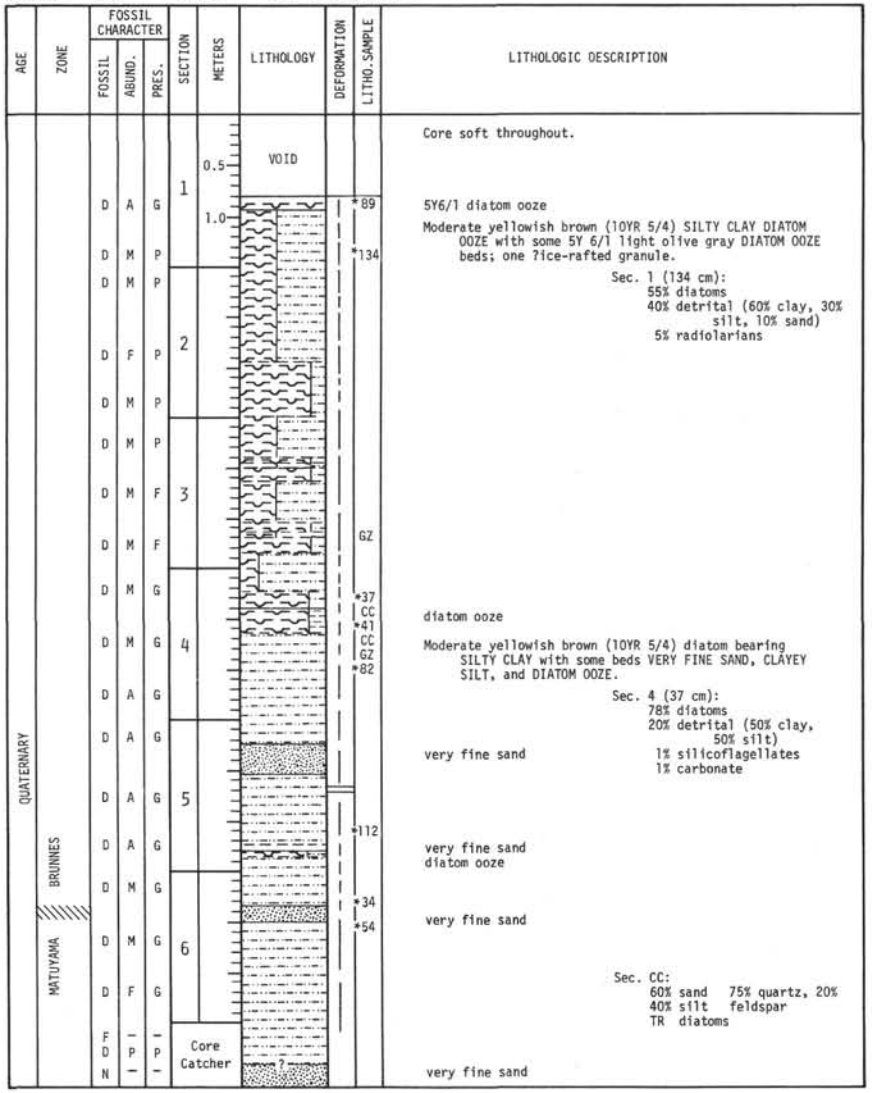


Figure 5. *(Continued).*

Site 269 Hole Core 1 Cored Interval: 0-8 m



Core soft throughout.

5Y6/1 diatom ooze

Moderate yellowish brown (10YR 5/4) SILTY CLAY DIATOM OOZE with some 5Y 6/1 light olive gray DIATOM OOZE beds; one ?ice-rafted granule.

Sec. 1 (134 cm):
55% diatoms
40% detrital (60% clay, 30% silt, 10% sand)
5% radiolarians

diatom ooze

Moderate yellowish brown (10YR 5/4) diatom bearing SILTY CLAY with some beds VERY FINE SAND, CLAYEY SILT, and DIATOM OOZE.

Sec. 4 (37 cm):
78% diatoms
20% detrital (50% clay, 50% silt)
1% silicoflagellates
1% carbonate

very fine sand

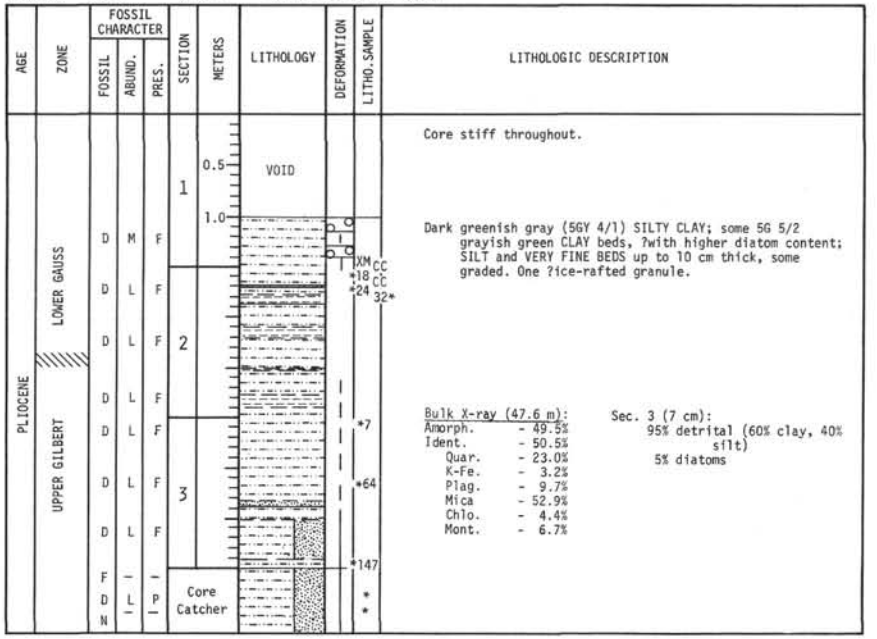
very fine sand
diatom ooze

very fine sand

Sec. CC:
60% sand 75% quartz, 20% feldspar
40% silt TR diatoms

very fine sand

Site 269 Hole Core 2 Cored Interval: 46-55.5 m



Core stiff throughout.

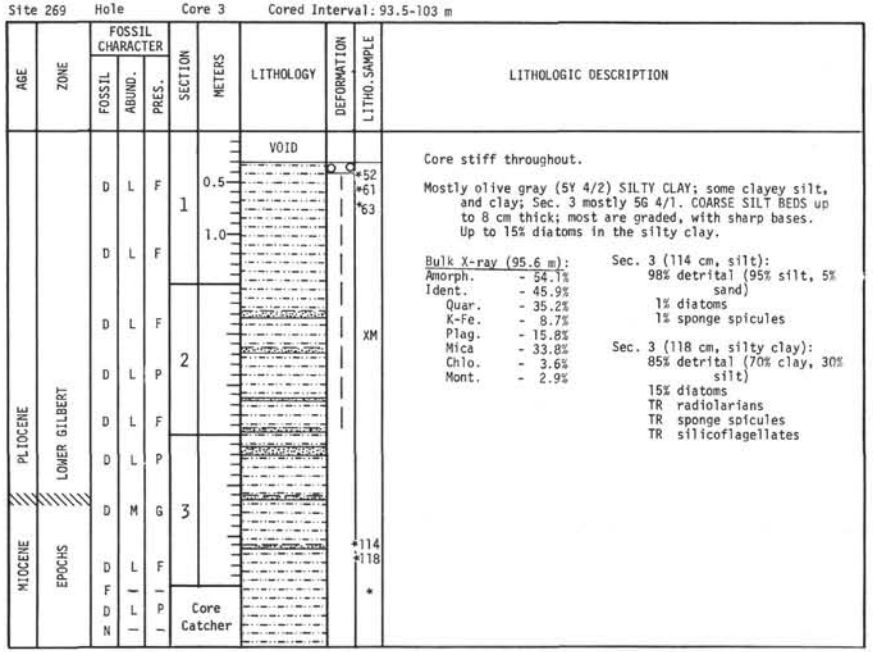
Dark greenish gray (5GY 4/1) SILTY CLAY; some 5G 5/2 grayish green CLAY beds, ?with higher diatom content; SILT and VERY FINE BEDS up to 10 cm thick, some graded. One ?ice-rafted granule.

Bulk X-ray (47.6 m):

Amorph.	- 49.5%
Ident.	- 50.5%
Quar.	- 23.0%
K-Fe.	- 3.2%
Plag.	- 9.7%
Mica	- 52.9%
Chlo.	- 4.4%
Mont.	- 6.7%

Sec. 3 (7 cm):
95% detrital (60% clay, 40% silt)
5% diatoms

Site 269 Hole Core 3 Cored Interval: 93.5-103 m



Core stiff throughout.

Mostly olive gray (5Y 4/2) SILTY CLAY; some clayey silt, and clay; Sec. 3 mostly 5G 4/1. COARSE SILT BEDS up to 8 cm thick; most are graded, with sharp bases. Up to 15% diatoms in the silty clay.

Bulk X-ray (95.6 m):

Amorph.	- 54.1%
Ident.	- 45.9%
Quar.	- 35.2%
K-Fe.	- 8.7%
Plag.	- 15.8%
Mica	- 33.8%
Chlo.	- 3.6%
Mont.	- 2.9%

Sec. 3 (114 cm, silt):
98% detrital (95% silt, 5% sand)
1% diatoms
1% sponge spicules

Sec. 3 (118 cm, silty clay):
85% detrital (70% clay, 30% silt)
15% diatoms
TR radiolarians
TR sponge spicules
TR silicoflagellates

Explanatory notes in Chapter 1

Site 269 Hole Core 4 Cored Interval: 141-150.5 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
UPPER MIOCENE		D	L	P	1	0.5	VOID			Core stiff throughout.
		D	L	P					*58	semilithified blocks of clay
						1.0				Dark greenish gray (5G 4/1) CLAYEY SILT and SILTY CLAY, in places, diatom-rich silt
		D	L	P					*132	Sec. 1 (132 cm): 92% detrital (60% silt, 40% clay): 45% quartz, 10% feldspar; 8% diatoms; TR radiolarians, carbonate
		F	–	–	Core Catcher					
		D	M	G					*	
		N	–	–						

Site 269 Hole Core 5 Cored Interval: 188.5-198 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
UPPER MIOCENE					1	0.5	VOID			Core stiff throughout.
										Dark greenish gray (5GY 4/1) CLAY; some silty clay.
						1.0				Sec. 1 (146 cm): 95% detrital (80% clay, 20% silt); 5% diatoms
		D	L	P					*146	
		F	–	–	Core Catcher					
		D	M	G					*	diatom bearing silty clay
		N	–	–						

Site 269 Hole Core 6 Cored Interval: 198-207.5 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
?LOWER UPPER MIOCENE?					1	0.5	VOID			Blocks of semi-lithified sediment separated by deformed stiff sediment.
		D	L	P		1.0				
		D	L	P						
		D	L	P	2				36	Dark greenish gray (5GY 4/1) CLAY; 2 or 3 COARSE SILT beds; up to 15% diatoms in lower part of core.
		D	L	P					GZ 103 CC	
		D	L	P						
		D	L	P	3					
		D	M	G					129	
		D	L	P						
		D	L	P	4				54	Bulk X-ray (203.3 m): Amorph. - 52.8%; Ident. - 47.2%; Quar. - 32.6%; K-Fe. - 11.9%; Plag. - 18.4%; Mica - 31.6%; Chlo. - 4.5%; Amph. - 1.0%
		D	M	P					CC 88	Sec. 4 (88 cm): 85% detrital (80% clay, 20% silt); 15% diatoms
		D	L	P						
		F	–	–	Core Catcher					
		D	L	P						
		N	–	–						

Explanatory notes in Chapter 1

Site 269 Hole Core 7 Cored Interval: 231-240.5 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
MIDDLE MIOCENE							VOID			Parts of core semi-lithified; other parts very stiff semi-lithified parts have much micro-fracturing.
						0.5				Olive gray (5Y 4/1) CLAY; in places, nanno bearing and diatom rich; in places, silty clay.
		D	L	P	1				79	Sec. 1 (79 cm): 72% detrital (80% clay, 20% silt); 20% diatoms; 8% calc. nannofossils
						1.0				
		D	M	F					117	
		D	M	P						Dark greenish gray (5GY 4/1) diatom rich CLAY NANNO OOZE.
										some clay beds
		D	L	F	2				56	silty clay
									57 1/2	Grayish olive (10Y 4/2) DIATOM CLAYEY SILT.
									120	
		D	L	P						silty clay; Sec. 3 (25 cm): 70% detrital (40% clay, 60% silt); 30% diatoms
		D	L	P	3				25	
		D	L	P					99	
		D	L	P					101	diatom silty clay
		D	M	F						Much disturbed blocks of: 10Y 4/2 diatom silty clay; 5Y 3/1 silty clay; 5Y 4/1 clay nanno ooze.
		F	I	I						
		D	A	G		Core Catcher				diatom silty clay
		N	—	—						

Site 269 Hole Core 8 Cored Interval: 293-302.5 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
MIDDLE MIOCENE										Core stiff throughout.
						0.5	VOID			Grayish olive (10Y 4/2) DIATOM RICH CLAYEY SILT.
		D	M	F	1					Sec. 1 (146 cm): 80% detrital (65% silt, 35% clay); 20% diatoms
		F				1.0				
		D	L	P					* 146	
		N				Core Catcher				diatom bearing silty clay

Site 269 Hole Core 9 Cored Interval: 331-340.5 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
?UPPER LOWER MIOCENE?							VOID			Core semi-lithified separated by deformed stiff intervals.
		D	L	F	1	0.5				silt
		D	L	P					* 83	
									* 93	
		D	L	P		1.0			* 101	1/2
										silt; Bulk X-ray (331.7 m): Amorph. - 45.1%; Ident. - 54.9%; Quar. - 45.5%; K-Fe. - 15.8%; Plag. - 23.3%; Mica - 10.6%; Chlo. - 1.9%; Mont. - 1.8%; Pyri. - 1.3%
		D	L	P						Bulk X-ray (333.2 m): Amorph. - 59.8%; Ident. - 40.2%; Quar. - 35.1%; K-Fe. - 13.5%; Plag. - 21.2%; Mica - 21.9%; Chlo. - 4.3%; Mont. - 4.1%
		D	L	P	2				* 63	silt
									* 68	
		D	L	P						silt
		D	L	P						Olive gray (5Y 4/1) CLAY; some SILTY CLAY; several SILT beds and laminae, up to 5 cm thick.
		D	L	P	3					
		D	M	P					* 71	silt
		D	M	P						very disturbed silt and clayey silt
		D	L	P	4					
		D	L	P					* 68	
		D	L	P					* 112	very disturbed silt and clayey silt
		D	L	P					* 139	
		D	L	P	5					Dark greenish gray (5G 4/1) CLAY; variable diatom content (TR to 20%); some silty clay.
		D	L	P					GZ * 123	Sec. 5 (123 cm): 80% detrital (70% clay, 30% silt); 20% diatoms
		F				Core Catcher				
		D	L	P					*	diatom clayey silt
		N								

Explanatory notes in Chapter 1

Site 269 Hole Core 10 Cored Interval: 359.5-369 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
					1	0.5 1.0	VOID			Drilling breccia with rare lithified and semi-lithified sediment; drilling breccia mainly claystone chips and fine sand.
					2				*14 *45	5G 4/1 CLAY partly chertified SILTY CLAY VERY FINE SAND CHERT. Silicified very fine sand and silicified laminated silty clay.
					3					silicified very fine sand
		F D N	— — —	— — —	Core Catcher					5G 4/1 chert

Site 269 Hole Core 11 Cored Interval: 388-397.5 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
?					1	0.5 1.0	VOID			Mostly drilling breccia (mainly clay). Some lithified and semi-lithified blocks. Bulk X-ray (389.6 m): Amorph. - 53.1% Ident. - 46.9% Quar. - 35.1% K-Fe. - 7.1% Plag. - 20.7% Mica - 27.8% Chlo. - 4.6% Mont. - 3.8% Amph. - 0.9%
					2				*13 *48	chertified claystone 5Y 2/1 clay 5GY 4/1 silty clay blocks of chert passing into partly chertified claystone and laminated silty claystone blocks of 5Y 2/1 clay laminated chert
		F D N	— — —	— — —	Core Catcher					chert

Site 269 Hole A Core 1 Cored Interval: 416.5-426 m

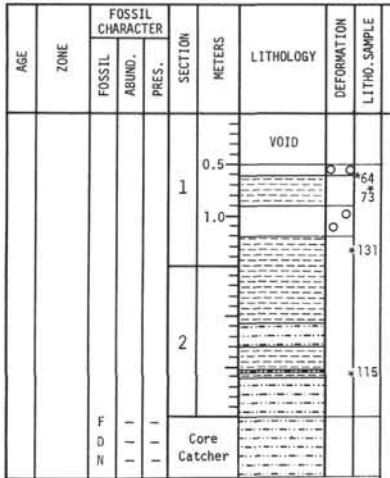
AGE	ZONE	FOSSIL CHARACTER: FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
					1	0.5 1.0	VOID			Throughout Hole 269A, sediments are semi-lithified, except for cherts and carbonate cemented lithologies, which are lithified. Grayish olive (10Y 4/2) CLAY and SILTY CLAY. Sec. 1 (128 cm): 90% detrital (95% clay, 5% silt) 8% diatoms 1% sponge spicules
									*128	5GY 2/1 chert
		D	M	P	2				*85 *95 *99	Dark greenish gray (5GY 4/1) diatom bearing SILTY CLAY and CLAY. Sec. 2 (85 cm): 85% detrital (65% clay, 35% silt) 15% diatoms poorly sorted SILT bed partly chertified X-λ fine SANDSTONE bed chertified claystone and chert
		F D N	— — —	— — —	Core Catcher					5G 2/1 chert

Site 269 Hole A Core 2 Cored Interval: 426-435.5 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
					1	0.5 1.0	VOID		*100	Dark olive gray (5Y 3/1) CLAY. Sec. 1 (100 cm): 100% detrital (90% clay, 10% silt)
					2				*142 *148	126-133 cm: partly chertified alternating silt and clayey silt laminae N7 carbonate cemented silty clay sand-silt-clay 10Y 4/2 carbonate cemented silty clay laminated silty clay and clayey silt
		F D N	— — —	— — —	Core Catcher				*	Grayish olive (10Y 4/2) clay. Dark olive gray (5Y 3/1) partly chertified claystone. Bulk X-ray (428.4 m): Amorph. - 52.7% Ident. - 47.3% Calc. - 10.4% Quar. - 35.7% K-Fe. - 13.7% Plag. - 19.4% Mica - 16.4% Chlo. - 2.2% Mont. - 1.2% Amph. - 1.1%

Explanatory notes in Chapter 1

Site 269 Hole A Core 3 Cored Interval: 473.5-483 m



Olive black (5Y 2/1) CLAY rare thin silt beds.

Sec. 1 (131 cm):
100% detrital (97% clay, 3% silt)

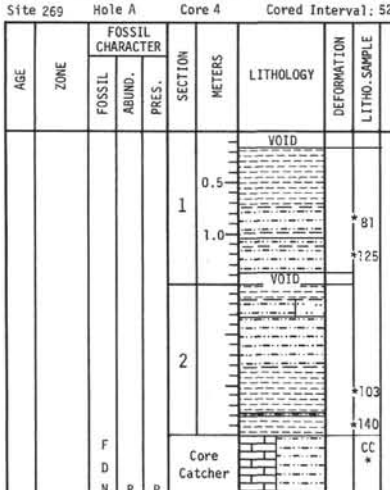
5GY 4/1 clay
with thin silt laminae

Two dark greenish gray
silty clay beds.

Dark greenish gray (5GY 4/1) SILTY CLAY.

Bulk X-ray (475.2 m):		Bulk X-ray (476.1 m):	
Amorph.	- 51.9%	Amorph.	- 51.5%
Ident.	- 48.1%	Ident.	- 48.5%
Quar.	- 28.1%	Quar.	- 32.2%
Cris.	- 29.3%	Cris.	- 11.9%
K-Fe.	- 7.0%	K-Fe.	- 10.6%
Plag.	- 13.5%	Plag.	- 15.8%
Mica	- 15.3%	Mica	- 19.6%
Chlo.	- 1.9%	Chlo.	- 2.6%
Mont.	- 4.9%	Mont.	- 5.2%
		Trid.	- 2.1%

Site 269 Hole A Core 4 Cored Interval: 521-530.5 m



Dark olive gray (5Y 3/1) CLAY.

Dark greenish gray (5GY 4/1) SILTY CLAY, with two graded (10Y 4/2) CLAYEY SILT beds.

dark olive gray (5Y 3/2) clay

graded bed of silty clay with silt laminae

Mottled grayish olive (10Y 4/2) SILTY CLAY.

Dark olive gray (5Y 3/2) CLAY.

carbonate cemented
nanno-rich silty clay

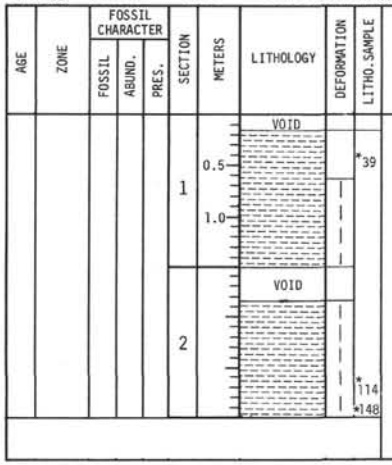
Sec. 1 (125 cm, clayey silt):
100% detrital (55% clay, 25% silt, 20% sand)

Sec. 2 (103 cm, clay):
100% detrital (65% clay, 35% silt)

Nanno-bearing carbonate cemented SILTY CLAY.

Bulk X-ray (523.0 m):		Bulk X-ray (523.5 m):	
Amorph.	- 33.8%	Amorph.	- 52.5%
Ident.	- 66.2%	Ident.	- 47.5%
Quar.	- 29.9%	Quar.	- 35.4%
Cris.	- 23.3%	Cris.	- 10.5%
K-Fe.	- 8.5%	K-Fe.	- 11.0%
Plag.	- 15.3%	Plag.	- 16.4%
Mica	- 15.3%	Mica	- 17.3%
Chlo.	- 2.1%	Chlo.	- 3.0%
Mont.	- 1.6%	Mont.	- 6.3%
Trid.	- 3.0%		
Amph.	- 0.9%		

Site 269 Hole A Core 5 Cored Interval: 568.5-578 m



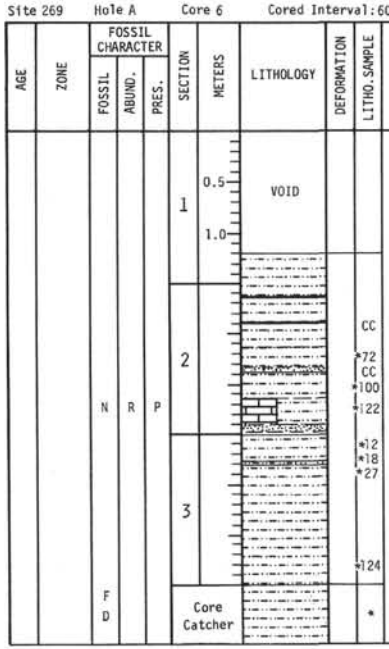
Olive black (5Y 2/1) CLAY; rare small burrows; a few laminae and thin beds of SILT.

Sec. 1 (39 cm, clay):
90% clay
10% silt

Sec. 1 (39 cm, silt):
90% silt
10% clay

no core catcher

Site 269 Hole A Core 6 Cored Interval: 606.5-616 m



Dark greenish gray (5GY 4/1) mottled SILTY CLAY and CLAY.

very fine sand
very fine sand
laminated clayey silt
very fine sand

Sec. 2 (100 cm):
98% detrital (55% clay, 44% silt, 1% sand)
2% carbonate
TR nannofossils

carbonate cemented silty clay
laminated clayey silt

many silt laminae

Explanatory notes in Chapter 1

Site 269 Hole A Core 7 Cored Interval: 654-663.5 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
	Catapsydrax unicavus	F	VR	P	1	0.5	VOID			Dark olive gray (5Y 3/1) SILTY CLAY, in places with silt laminae, mottling rare.
						1.0				Some dark greenish gray (5GY 4/1) SILTY CLAY, strongly mottled.
										Graded beds of very fine SAND to coarse SILT to clayey silt. In places, laminated or cross laminated; in places, mottled.
									CC	
					2				*8	Sec. 2 (8 cm): 70% clay, 30% silt, TR calc. nannofossils
									*32	
									*37	
									*65	
									*104	Sec. 2 (121 cm): 65% silt, 30% clay, 5% sand, TR calc. nannofossils
									CC	
									*121	
									CC	
					3				*138	
									CC	
					4					
		F	—	—	Core Catcher				*	carbonate-cemented laminated silt
		D	—	—						
		N	—	—						silty clay

Site 269 Hole A Core 8 Cored Interval: 701.5-711 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
					1	0.5	VOID			Dark olive gray (5Y 3/1) SILTY CLAY; mottling rare; some silt laminae; some dark greenish gray (5GY 3/1) mottled SILTY CLAY.
						1.0			*95	Sec. 1 (149 cm, silty clay): 80% clay, 20% silt
									CC	
									*145	
									*149	SILT beds as shown in lithology column.
									*5	
					2				*90	laminated silt overlying poorly sorted mottled silt
										carbonate cemented silty sand
										poorly sorted silt
									* 25	Sec. 3 (103 cm, poorly sorted silt): 55% silt, 30% clay, 15% sand, 4% carbonate, 1% calc. nannofossils
					3				*103	poorly sorted silt
									*123	many silt laminae
										graded well sorted clayey silt bed many silt laminae, some cross lamination
										carbonate cemented poorly sorted silty sand
					4				*92	intensely mottled poorly sorted clayey silt well sorted coarse silt, some cross lamination laminated silts and clayey silts
		F	—	—	Core Catcher					carbonate cmeented silty clay
		D	—	—						
		N	—	—						

Bulk X-ray (702.5 m):

Amorph.	- 32.9%
Ident.	- 67.1%
Quar.	- 38.6%
K-Fe.	- 7.9%
Plag.	- 13.1%
Mica	- 16.8%
Chlo.	- 3.2%
Mont.	- 20.3%

Bulk X-ray (703.5 m):

Amorph.	- 28.2%
Ident.	- 71.8%
Quar.	- 43.9%
K-Fe.	- 11.8%
Plag.	- 18.6%
Mica	- 18.1%
Chlo.	- 2.4%
Mont.	- 5.2%

Bulk X-ray (703.6 m):

Amorph.	- 23.5%
Ident.	- 76.5%
Quar.	- 38.8%
K-Fe.	- 8.7%
Plag.	- 16.4%
Mica	- 16.0%
Chlo.	- 2.2%
Mont.	- 18.0%

Explanatory notes in Chapter 1

Site 269 Hole A Core 9 Cored Interval: 749-758.5 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
					1	0.5 1.0	VOID			Olive gray (5Y 4/1) and medium dark gray (N4) SILTY CLAY and CLAY; rare (5GY 4/1) mottled SILTY CLAY; SILT beds as shown in lithology column.
									144 148 *73	carbonate cemented very fine sand poorly sorted silt Sec. 2 (13 cm, poorly sorted silt): 75% silt 20% clay 5% sand
					2					poorly sorted silt Sec. 3 (147 cm, clay): 90% clay 10% silt silt brownish gray (5YR 4/1) silty clay
					3				*5	poorly sorted silt laminated silt, lower part carbonate cemented brownish gray (5YR 4/1) silty clay
									*147 *149	brownish gray (5YR 4/1) silty clay
		F D N	— — —	— — —	Core Catcher				*	5GY 4/1 silty clay

Site 269 Hole A Core 10 Cored Interval: 806-815.5 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
					1	0.5 1.0	VOID			Dark olive gray (5Y 3/1) SILTY CLAY and CLAY. Sec. 1 (143 cm, clay): 98% clay 2% silt
									*94	graded silt bed Sec. 1 (94 cm, graded silt bed): 55% silt 45% clay
									*138 *143	graded silt bed
					2				XM 100 *120 *128 138	Brownish gray (5YR 4/1) SILTY CLAY. Rare silt laminae.
									*4 *7	Mostly brownish gray (5YR 4/1) SILTY CLAY with graded beds of SILT and very fine SAND; intense mottling in places; some beds appear reverse graded. Bulk X-ray (808.3 m): Amorph. - 33.0% Ident. - 67.0% Quar. - 45.7% K-Fe. - 12.0% Plag. - 18.6% Mica - 13.8% Chlo. - 2.3% Mont. - 7.6%
					3				*99	
									*144	
					4				*73 *77	Brownish gray (5YR 4/2) SILTY CLAY with many beds of SILT, and many SILT laminae; only a few silt beds appear graded.
		F D N	— — —	— — —	Core Catcher					

Explanatory notes in Chapter 1

Site 269 Hole A Core 11 Cored Interval: 853.5-863 m

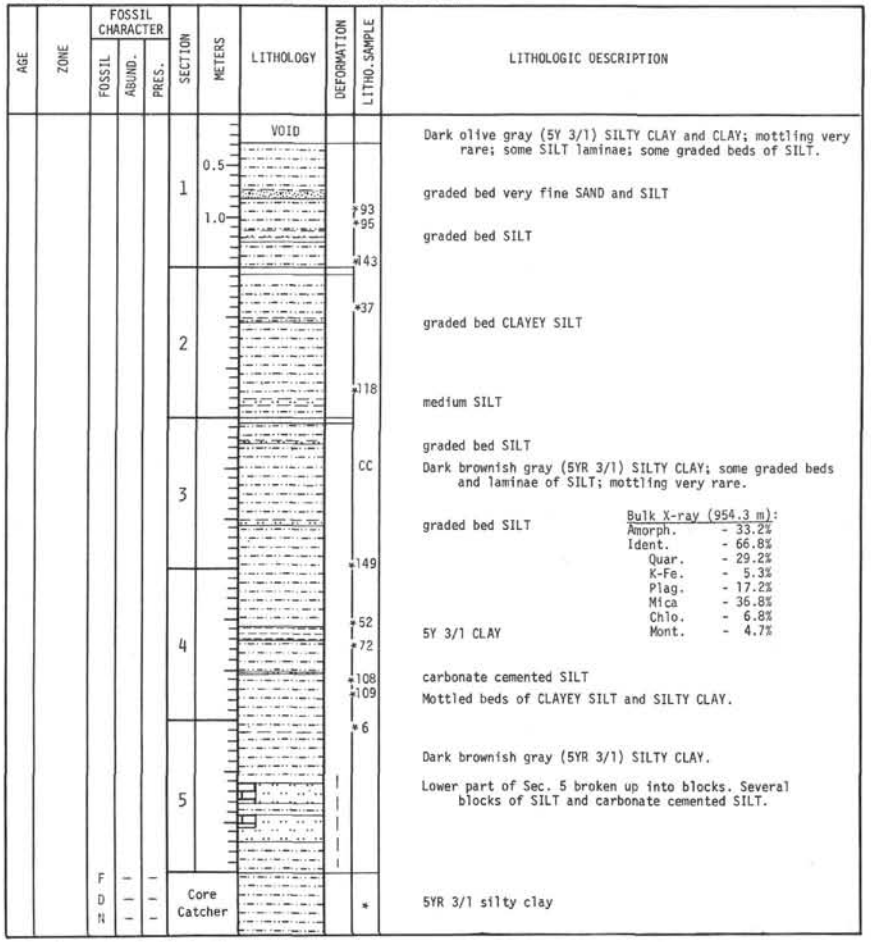
AGE	ZONE	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
					1	0.5	VOID		*79	Brownish gray (5YR 4/1) SILTY CLAY; silt laminae common; many beds of mottled poorly sorted coarse SILT and very fine SAND. Sharp tops, mottled bases. Mottling common in silty clay.
						1.0			81 *	
									*99	
									>147	
							VOID			
					2			I	*75	
								I		
								I		
					3				CC	Brownish gray (5YR 4/1) SILTY CLAY; many silt laminae, and some graded SILT and very fine SAND beds.
									*122	Sec. 3 (122 cm, silt lamina): 100% silt
									CC	
									CC	
					4					
		F	–	–	Core Catcher					
		D	–	–						
		N	–	–						

Site 269 Hole A Core 12 Cored Interval: 901-910.5 m

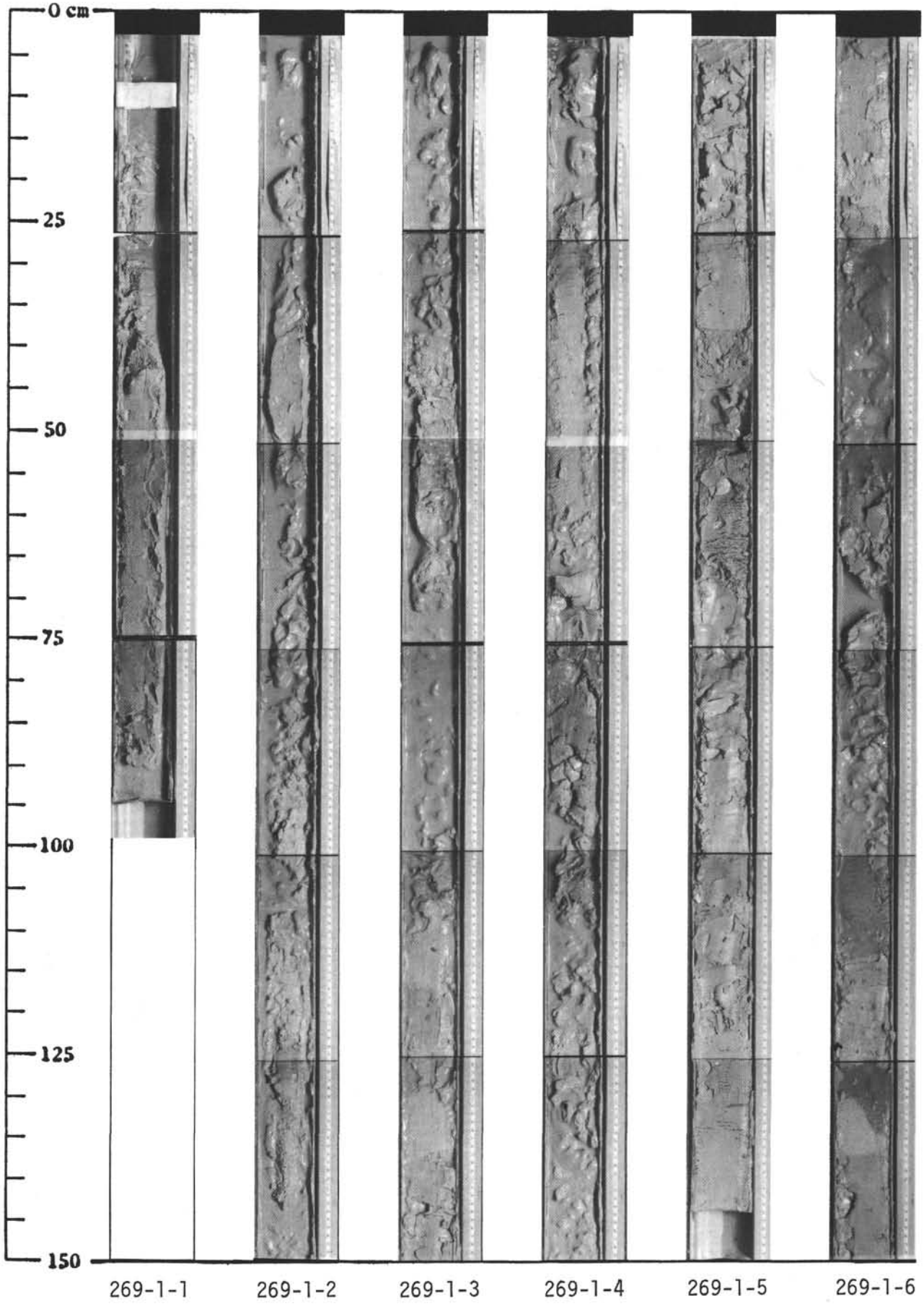
AGE	ZONE	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
						ZERO SECT.			*29	5Y 3/1, 5YR 3/1 and 5GY 4/1 beds of SILTY CLAY; some mottling; some SILT laminae; some CLAYEY SILT.
					1	0.5			*21	poorly sorted very fine sand
						1.0				Dark brownish gray (5YR 3/1) SILTY CLAY and CLAY; some thin graded beds laminated SILT; mottling rare.
									*74	Sec. 1 (74 cm, silt lamina): 90% silt 10% clay
									*78	
									CC	Sec. 1 (78 cm, clay): 90% clay 10% silt
					2					
									*121	Dark brownish gray (5YR 3/1) SILTY CLAY and mottled reverse graded beds of very fine SAND.
									*140	
									*147	
									*10	
					3				*51	many silt laminae
										Dark brownish gray (5YR 3/1) SILTY CLAY and CLAY; no mottling; some silt laminae.
									*120	
									*133	
									*141	carbonate cemented mottled very fine sand — Mottled 5YR 5/1, 5G 3/1 and 5YR 3/1 SILTY CLAY and CLAYEY SILT.
									*7	many silt laminae
					4					Dark olive gray (5Y 3/1) SILTY CLAY and CLAY; some mottling in places; some silt laminae and lenses.
									*93	many silt laminae
									*120	
									CC	
									XM	Sec. 5 (24 cm, clay): 80% clay 20% silt
									*24	
									*28	
		F	R	P	5				*72	intense mottling
		N	R	P					*91	
									*99	mottled poorly sorted silt
										mottled clayey silt
									*147	Bulk X-ray (907.0 m): Amorph. – 39.5%; Ident. – 60.5%; Quar. – 42.4%; K-Fe. – 5.8%; Plag. – 16.1%; Mica – 17.2%; Chlo. – 3.0%; Mont. – 15.5%
										many silt laminae
					6					many silt laminae
									*106	
		F	–	–	Core Catcher					
		D	–	–						
		N	–	–						

Explanatory notes in Chapter 1

Site 269 Hole A Core 13 Cored Interval: 948.5-958 m



Explanatory notes in Chapter 1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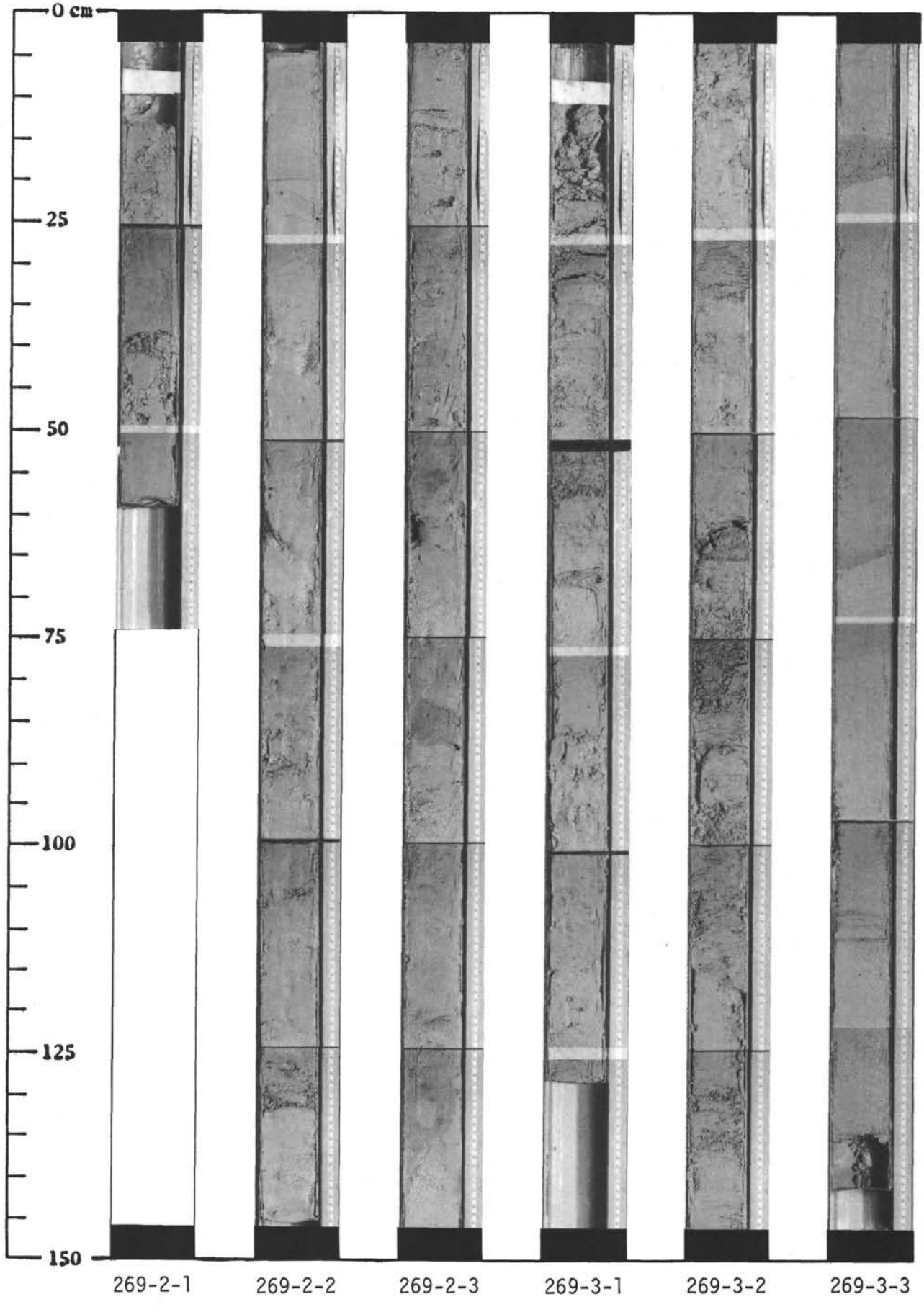
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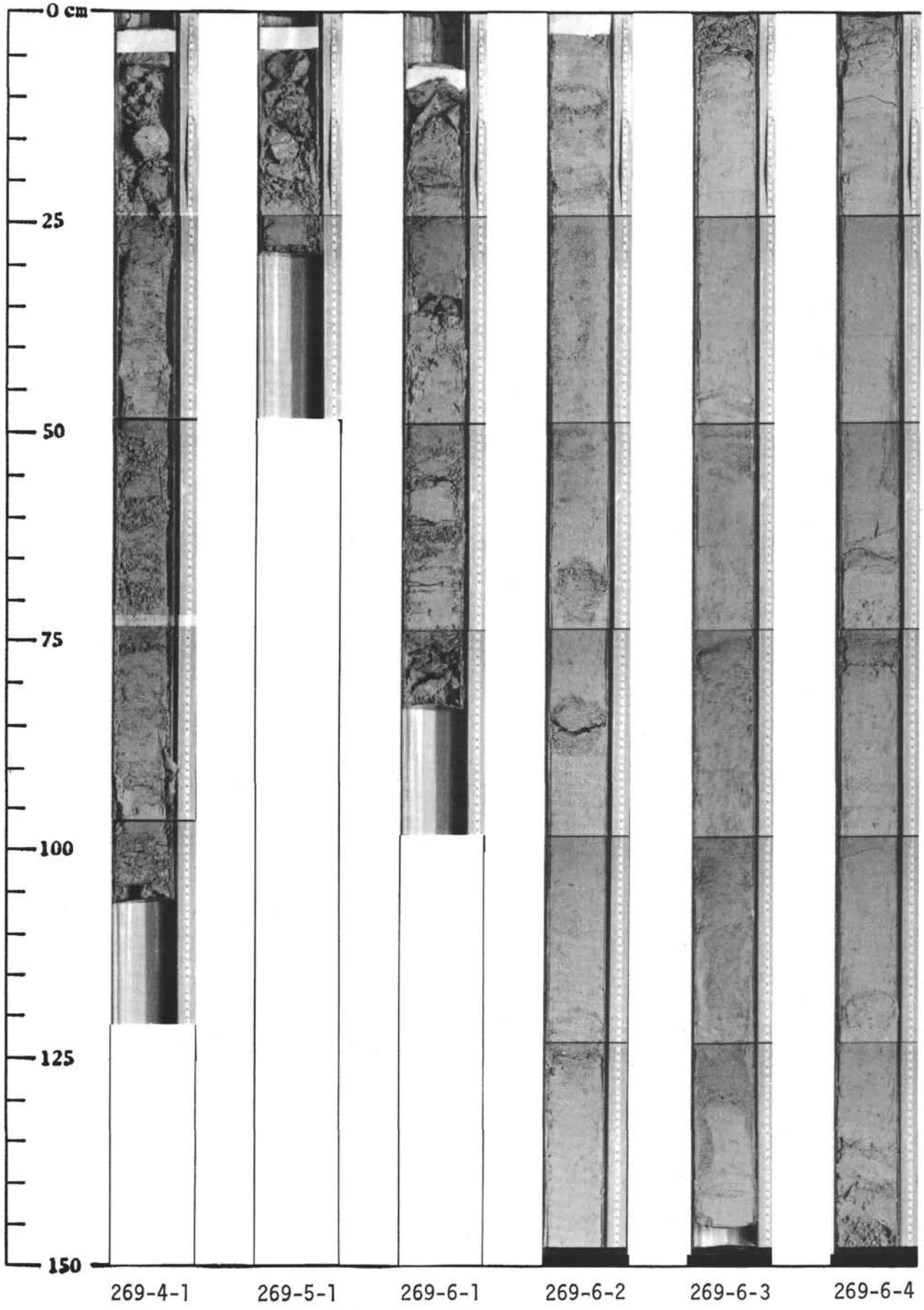
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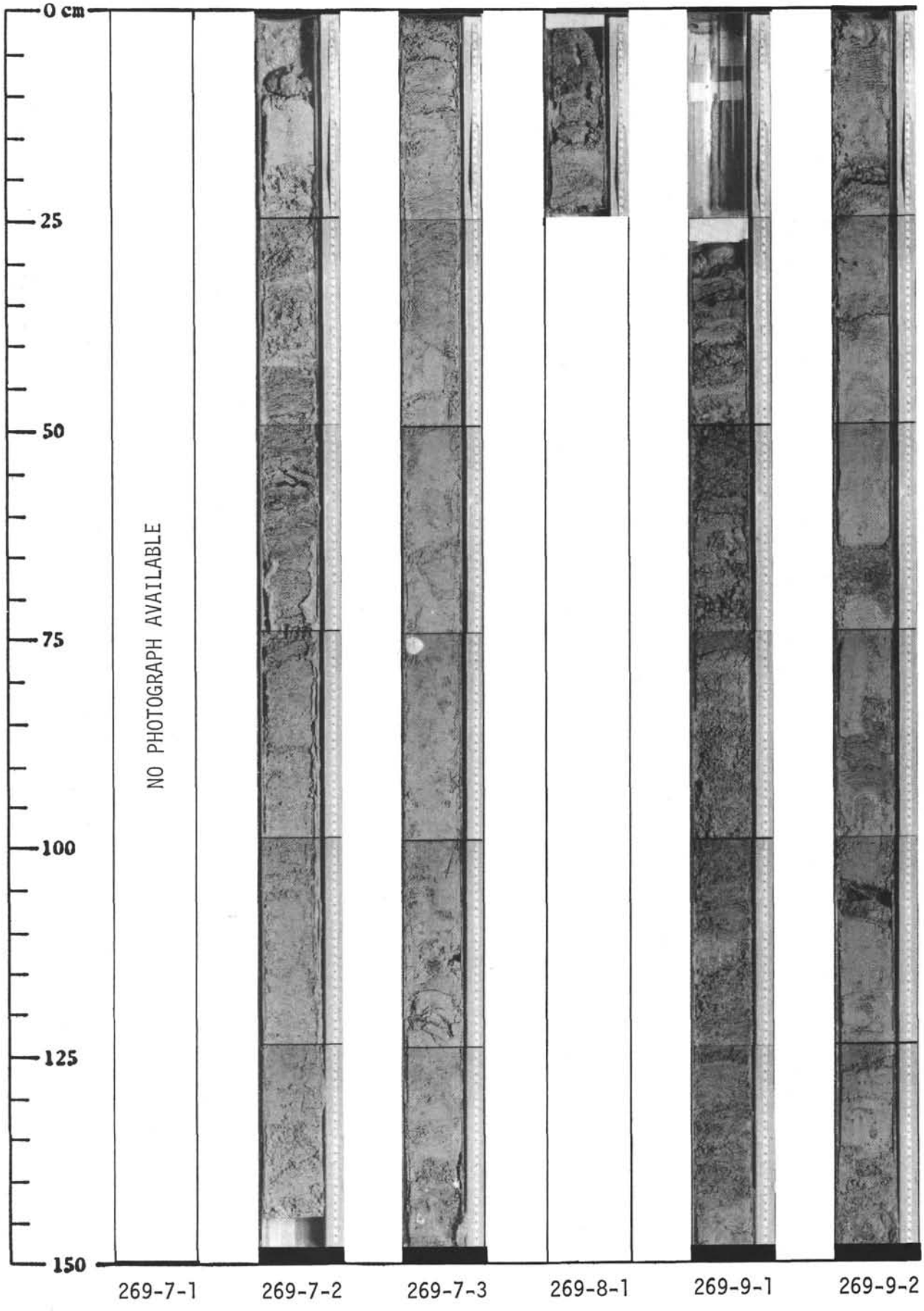
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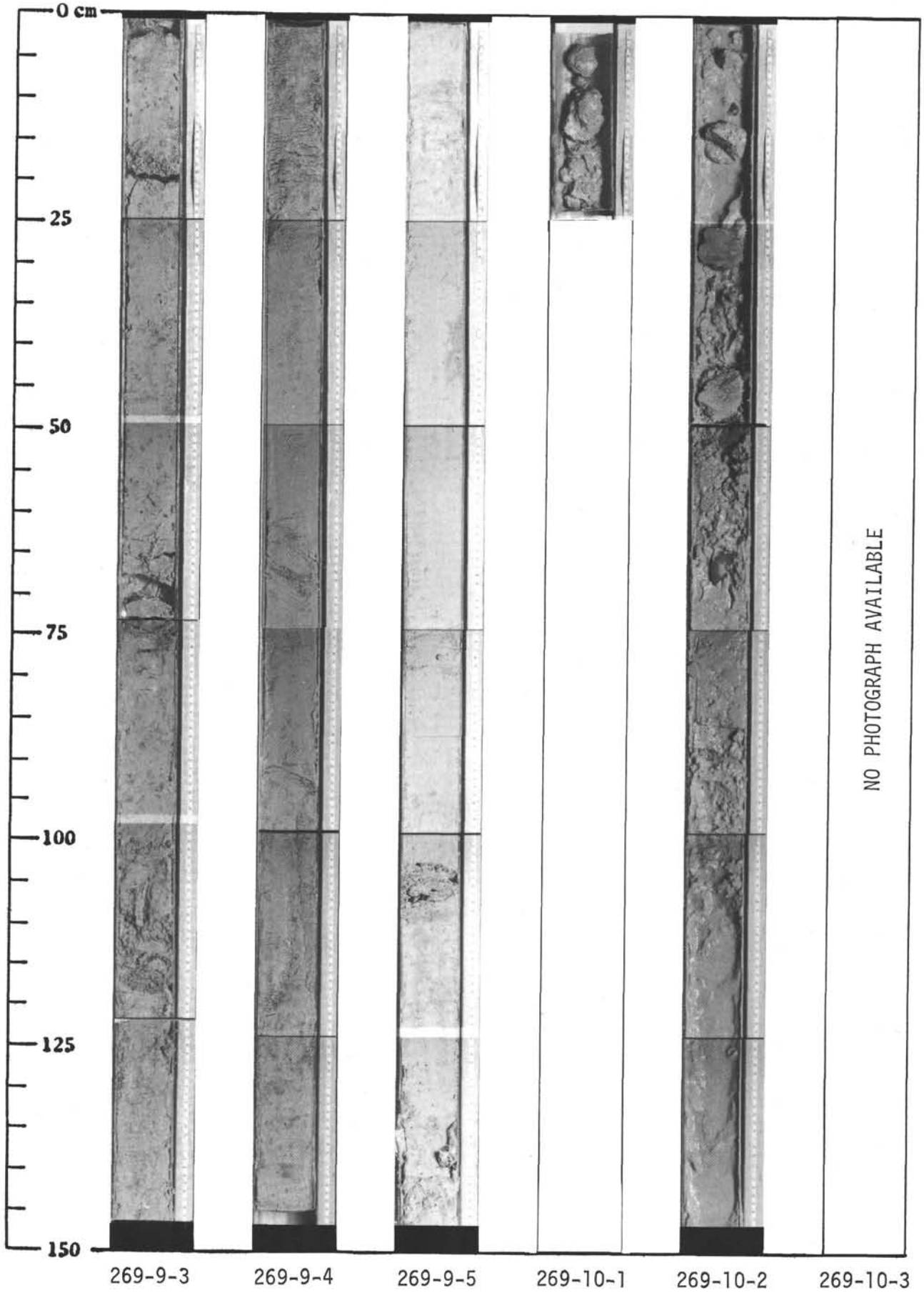
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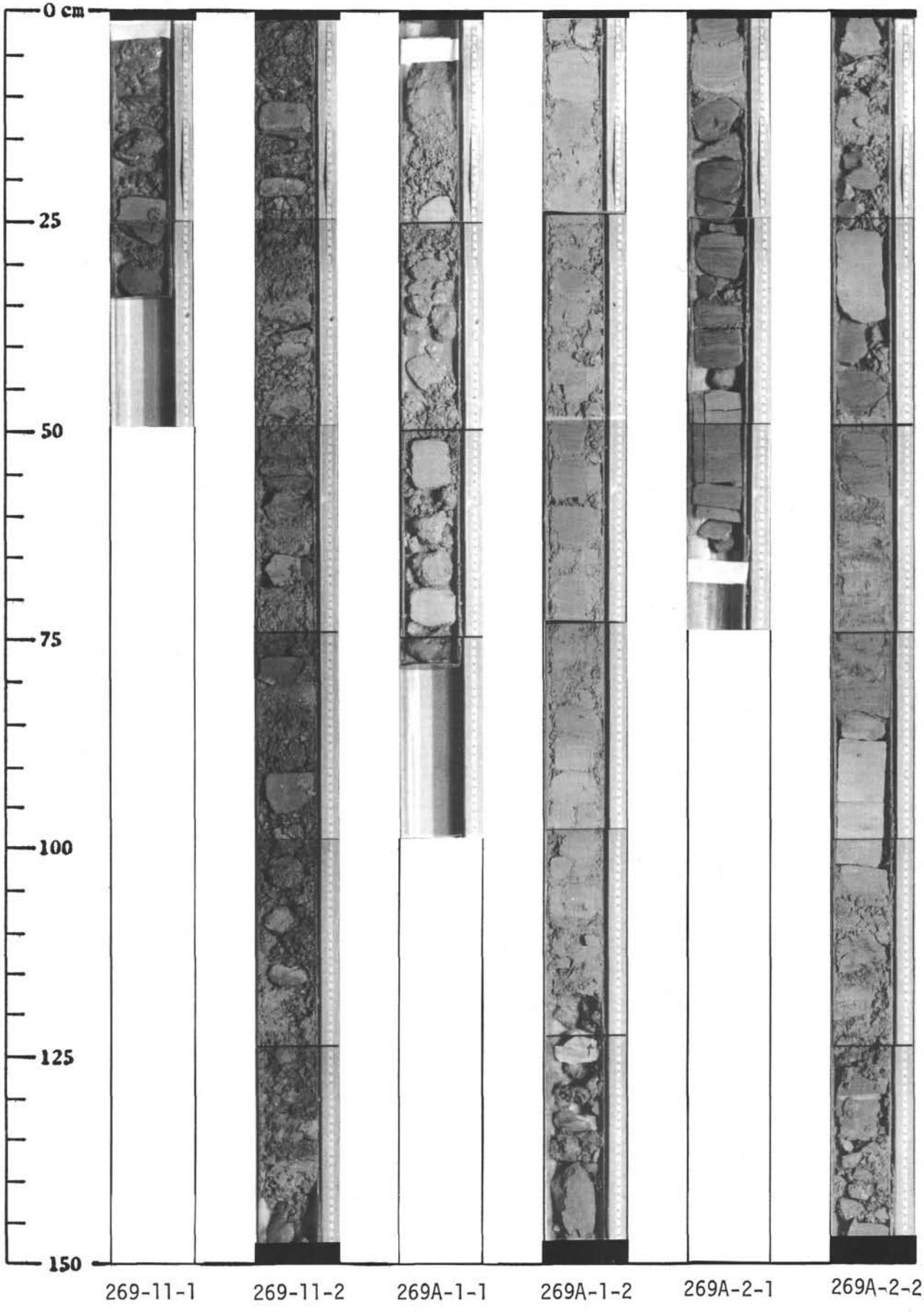
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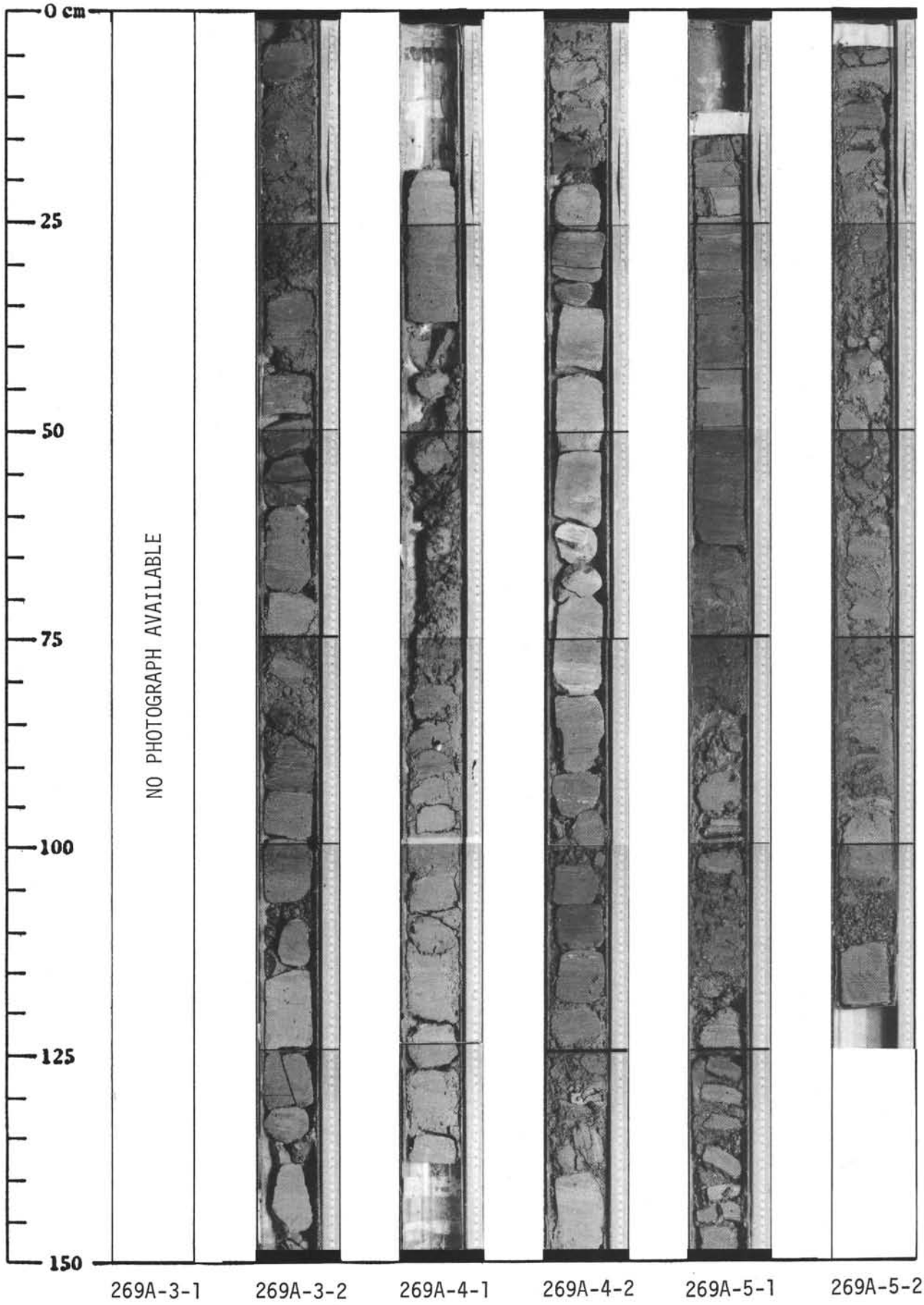
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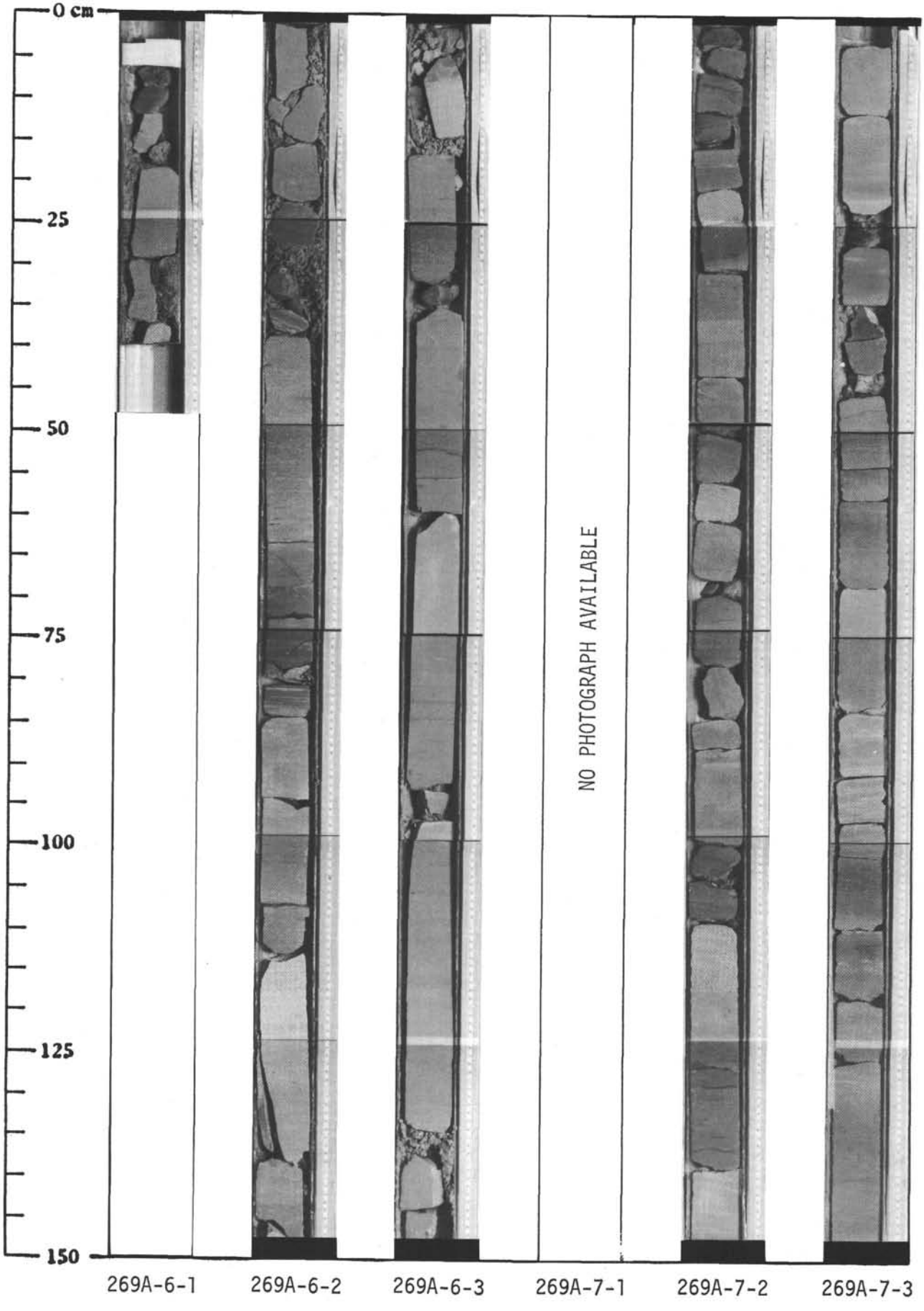
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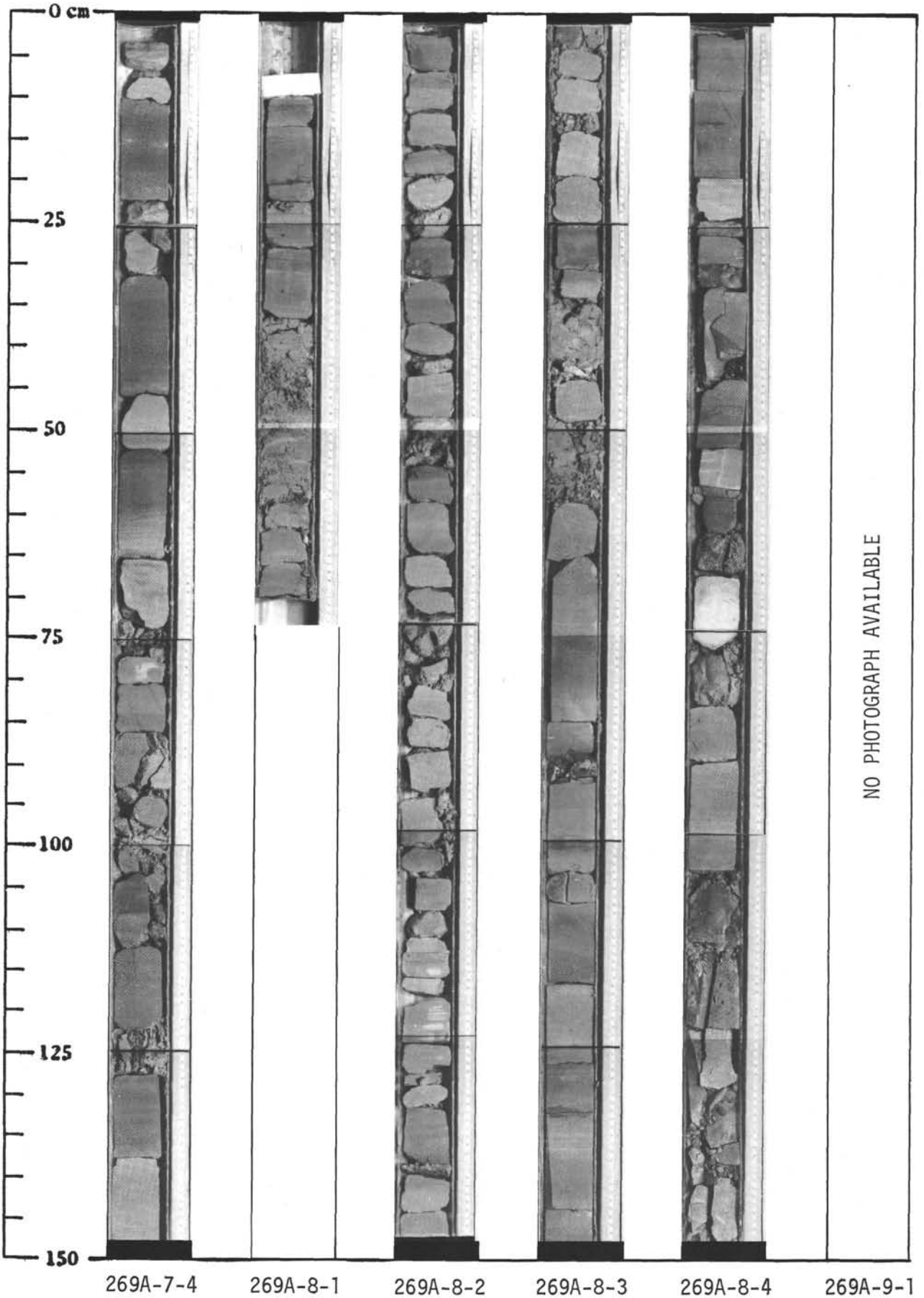
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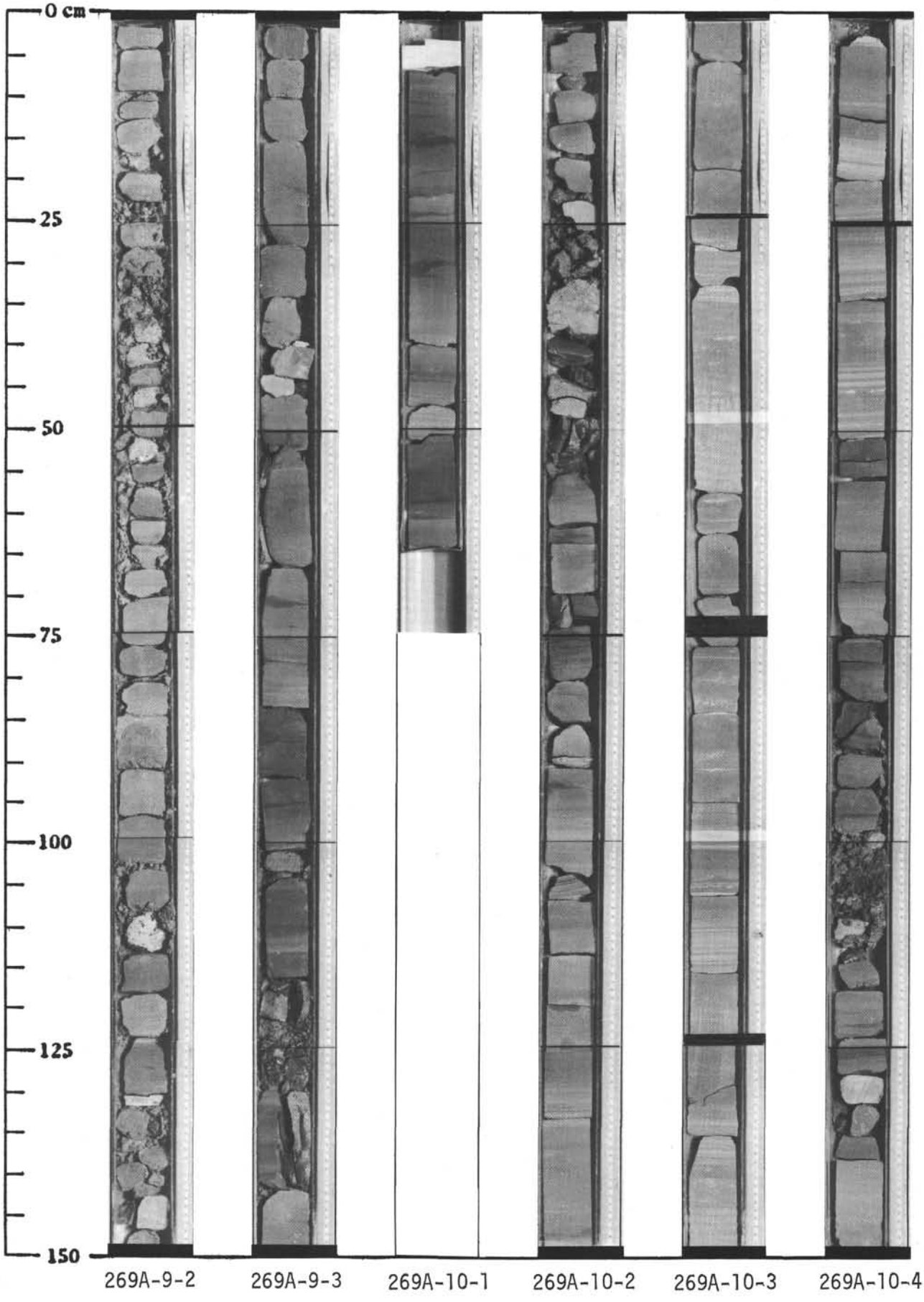
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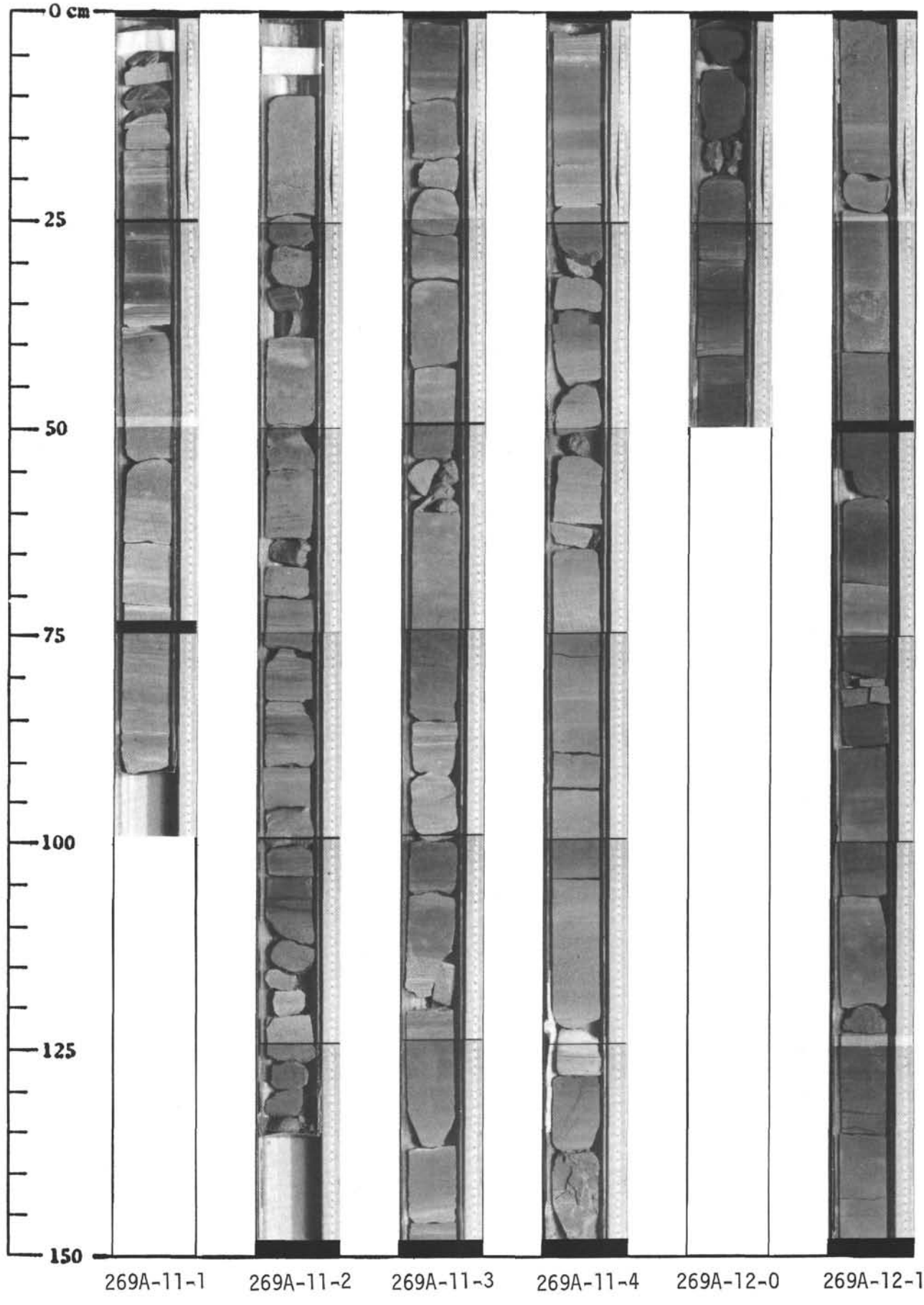
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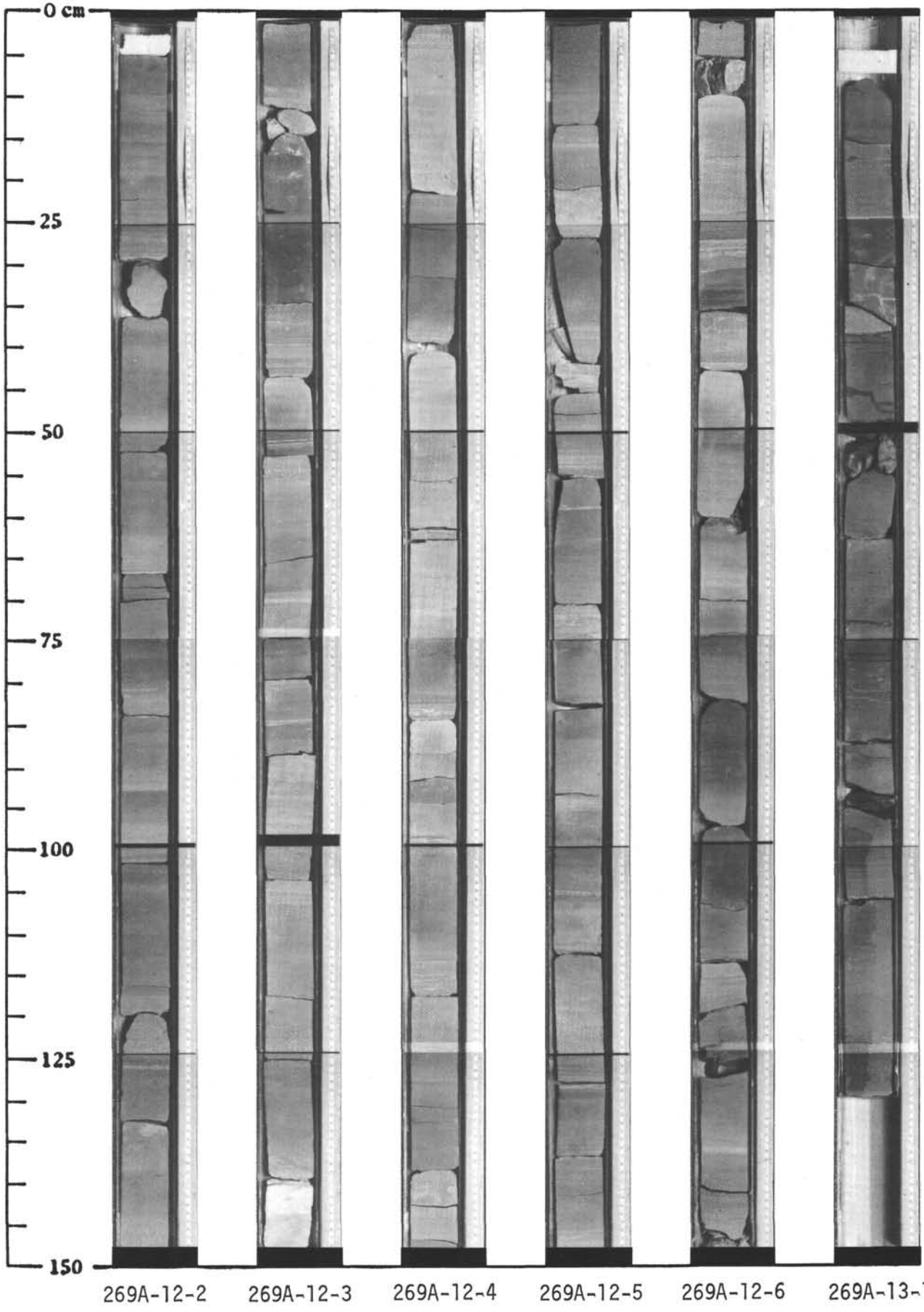
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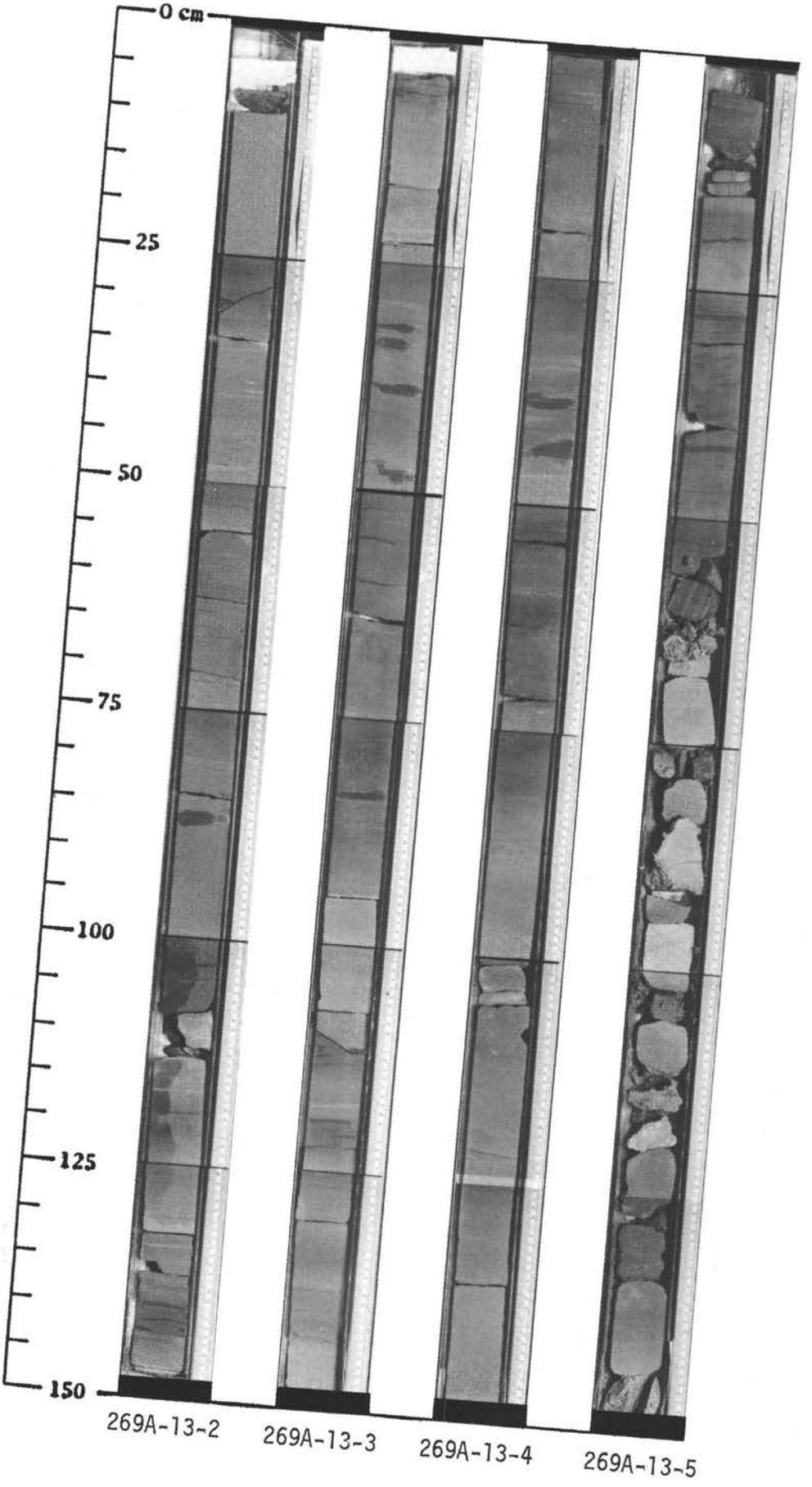
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