3. SITE 265

The Shipboard Scientific Party[1]

SITE DATA

Date Occupied: 29 December 1972

Date Departed: 1 January 1973

Position: 53°32.45′S; 109°56.74′E

Water Depth: 3581 corrected meters (echo sounding)

Water Depth (adopted): 3582 meters (drill pipe from rig floor)

Total Penetration: 462 meters

Number of Cores: 18

Total Section Cored: 169 meters

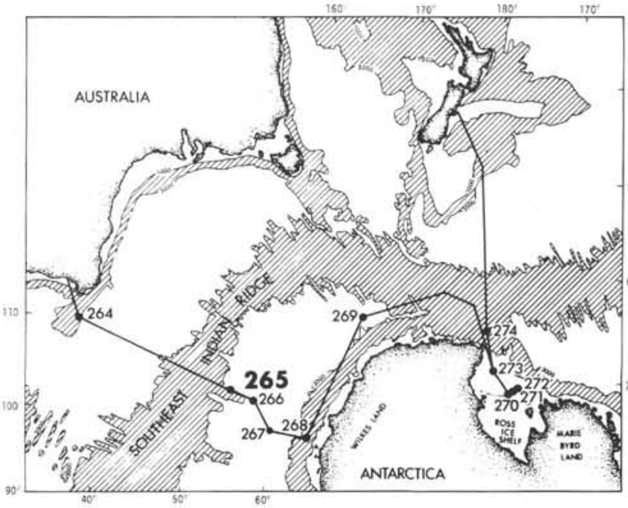
Total Section Recovered: 108 meters

Percentage Core Recovery: 64%

Oldest Sediment Cored:
Depth below sea floor: 444 meters
Lithology: Nanno ooze and chalk
Age: Lower middle Miocene

Basement:
Depth below sea floor: 0.5 sec (reflection time)
Depth below sea floor: 444.5 meters (drilled)
Average velocity to basement: 1.78 km/sec
Lithology: Basalt

Principal Results: About 370 meters of predominantly diatom oozes of Recent to early Pliocene age overlie about 75 meters of nannofossil ooze and chalk of late to mid Miocene age. The significance of the marked lithologic change and the precise time (somewhere in the interval 10 m.y. to 4 m.y.) at which the change occurred is not yet known. The lithologic change may relate to a major climatic event such as the initiation of the Antarctic Convergence in the middle Gilbert (~4 m.y.B.P.) as suggested by Hays (1965). Sedimentation rates are extremely high during the Quaternary, occasionally exceeding 130 m/m.y. Relatively fresh, coarse-grained tholeiitic basalt was recovered below the ooze. The age of the basal sediment resting on the basalt is middle Miocene, in excellent agreement with the age of the basement as predicted from magnetic lineations.



BACKGROUND AND OBJECTIVES

Site 265 is located on the south flank of the Southeast Indian Ridge (Figure 1) and about 500 km from the ridge crest in a water depth of about 3560 meters. Magnetic anomaly lineations are well defined in this region and indicate the age of the oceanic crust to be 12 to 15 m.y. old. An anomalously thick sequence of acoustically transparent sediment overlies oceanic layer 2 at the site (Figure 2). Seismic profiler records show a very weak return from the sea floor, with a much stronger return from the underlying basement. This indicates very "soft" sediments at the mud line and may present difficulties in determining the depth by tagging the bottom with the drill string. The sediments are about 400 to 500 meters thick (0.5-0.6 sec reflection time) as compared with about 100 to 200 meters at other localities where the age of the crust is the same. The areal extent of the "thick sediment patch" is not well defined, but probably exceeds 10^5 km^2. The inferred average sedimentation rate at this site is thus high, being about 4± cm/1000 yr.

Site 265 lies about 300 to 400 km south of the present position of a major oceanographic singularity, the Antarctic Convergence.

The position of the Antarctic Convergence is known to play an important role in determining the distribution of siliceous versus carbonate sediments on the underlying sea floor. The objective at this site was to investigate the nature of rapid sedimentation here and to contrast it with the more "normal" regimen anticipated at the third

[1]Dennis E. Hayes, Lamont-Doherty Geological Observatory, Palisades, New York (Co-chief scientist); Lawrence A. Frakes, Florida State University, Tallahassee, Florida (Present address: Monash University, Clayton, Victoria, Australia) (Co-chief scientist); Peter J. Barrett, Victoria University of Wellington, Wellington, New Zealand; Derek A. Burns, New Zealand Oceanographic Institute, Wellington, New Zealand; Pei-Hsin Chen, Lamont-Doherty Geological Observatory, Palisades, New York; Arthur B. Ford, U.S. Geological Survey, Menlo Park, California; Ansis G. Kaneps, Scripps Institution of Oceanography, La Jolla, California; Elizabeth M. Kemp, Florida State University, Tallahassee, Florida (Present address: Bureau of Mineral Resources, Canberra City, Australia); David W. McCollum, Florida State University, Tallahassee, Florida (University of South Carolina, Beufort, South Carolina); David J.W. Piper, Dalhousie University, Halifax, Nova Scotia; Robert E. Wall, National Science Foundation, Washington, D.C.; Peter N. Webb, New Zealand Geological Survey, Lower Hutt, New Zealand (Present address: Northern Illinois University, de Kalb, Illinois).

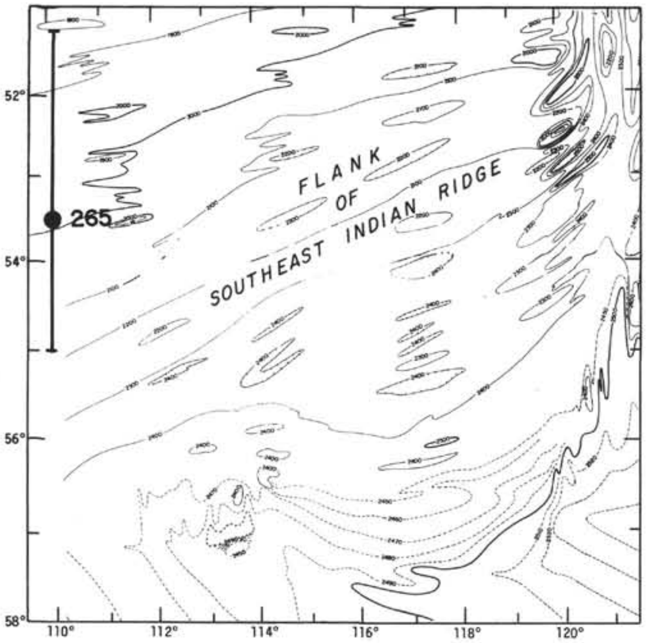


Figure 1. *Location of Site 265 and bathymetry. Contours in fathoms (corrected). Solid line shows location of* Eltanin *49 seismic profile shown in Figure 2.*

Leg 28 site (266), located about 300 km to the south. Another objective was to study the biostratigraphy at a site near the Antarctic Convergence in an area where mixed siliceous and carbonate fauna and flora are expected and to determine the historical stability of the convergence in this area. A third objective was to obtain a fresh sample of oceanic basement (layer 2).

OPERATIONS

The approach to Site 265 was made on a course of 222° at reduced speed of about 7 knots.

In an effort to improve the subbottom reflection record, the ship's speed was further reduced to about 5 knots. Even at this speed the profiler record was of marginal quality with only a suggestion of a bottom reflection and a very diffuse return from acoustic basement.

The final site selection was made, on the basis of the profiler and PDR records which showed the presence of about 0.50 sec (two-way travel time) of extremely transparent sediment overlying acoustic basement. The ship continued past the site at slow ahead while the towed gear was retrieved, then reversed course and returned to the selected site using the PDR trace as a guide for dropping the beacon. The beacon was dropped at 2350 on 29 December 1972 in 3571 meters of water (PDR corrected for sound velocity) and dynamic positioning in automatic mode was achieved by 0400 on 30 December.

While the bottom-hole assembly and drill pipe were being run, a sonobuoy record was obtained. The airgun was floated at about 2 ft subsurface. This eliminated much of the bubble pulse, but the decrease in energy output coupled with the very slow drift (ca 1/4 knot) of the sonobuoy and almost continuous screw and thruster noise produced a very poor record.

Hole 265 was spudded in at 1230 on 30 December. Drilling with intermittent coring was carried out to a depth of 462 meters subbottom (Table 1). A total of 18 cores was taken, 16 in sediment and 2 in basement. Of those in the sediment, total penetration was 151.5 meters, core recovered totaled 104.1 meters for an average recovery rate of 69%. Recovery was quite variable with eight cores better than 85% recovery and the remainder ranging down to "core catcher only." The last two cores penetrated about 17 meters into basement and recovered 3.6 meters of basalt.

Drilling and coring operations were suspended for a period of several hours because of problems with the hydraulic pumping system. No problems were encountered with the dynamic positioning system.

The drill string and bottom-hole assembly were recovered and secured and the ship got underway at 0800 on 1 January 1973.

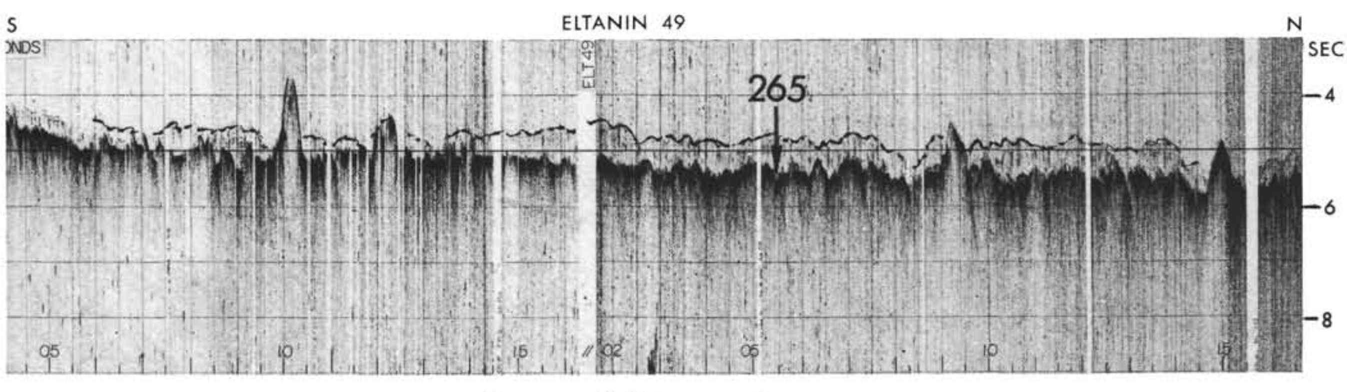


Figure 2. Eltanin *49 acoustic reflection profile in vicinity of Site 265. Vertical scale in seconds of two-way reflection time. Location of profile shown in Figure 1.*

TABLE 1
Coring Summary, Site 265

Core	Date (Dec. 1972)	Time	Depth From Drill Floor (m)	Depth Below Sea Floor (m)	Cored (m)	Recovered (m)	Recovery (%)
1	30	1358	3592.0-3601.0	0.0-9.0	9.0	9.0	100
2	30	1510	3610.5-3620.0	18.5-28.0	9.5	8.0	84
3	30	1616	3639.0-3648.5	47.0-56.5	9.5	5.0	52
4	30	1723	3667.5-3677.0	75.5-85.0	9.5	4.3	50
5	30	1842	3696.0-3705.5	104.0-113.5	9.5	9.3	98
6	30	1956	3724.5-3734.0	132.5-142.0	9.5	5.3	56
7	30	2113	3753.0-3762.5	161.0-170.5	9.5	8.3	87
8	30	2246	3781.5-3791.0	189.5-199.0	9.5	6.8	72
9	31	0010	3810.0-3819.5	218.0-227.5	9.5	9.5	100
10	31	0208	3838.5-3848.0	246.5-256.0	9.5	7.5	78
11	31	0435	3867.0-3876.5	275.0-284.5	9.5	0.4	4
12	31	0640	3895.5-3905.0	303.5-313.0	9.5	cc	–
13	31	0825	3924.0-3933.5	332.0-341.5	9.5	3.3	35
14	31	1210	3953.5-3962.0	360.5-370.0	9.5	9.4	99
15	31	1730	3990.5-4000.0	398.5-408.0	9.5	9.0	95
16	31	1900	4019.0-4028.5	428.0-436.5	9.5	9.0	95
17	31	2033	4036.5-4044.5	444.5-452.5	9.5	1.5	19
18	31	2300	4044.5-4054.0	452.5-462.0	9.5	2.1	22
Total					169.0	108.0	64

LITHOLOGY

General

Five principal lithostratigraphic units are recognized in cores from Site 265. As indicated in Table 2, four middle Miocene and younger sedimentary units are composed chiefly of siliceous and calcareous oozes totaling 445 meters in thickness. Drilling terminated in basalt at a total subbottom depth of 462 meters. Absence of metamorphic effects in barely lithified basal sediments suggests, along with other evidence, that the contact below the sedimentary sequence is depositional rather than intrusive. Because of locally poor core recovery and incomplete coring, the contacts between the four sedimentary units were not observed.

The intercalated siliceous and calcareous sediments at this site possibly record movements of the important oceanographic barrier, the Antarctic Convergence, now lying only 300 to 500 km to the north. Terrigenous components are here generally minor in the dominantly pelagic sediments, except for the occurrence at 2.3 meters below the sediment surface of a small, subangular pebble, which might be a dropped clast.

Unit 1: Clay-Bearing Diatom Ooze

Soft to soupy diatom ooze lies directly beneath the sea floor and makes up the youngest unit recognized. The ooze is between 57 and 75 meters thick, generally clay bearing, and contains variable but mostly minor or trace amounts of micarb, sponge spicules, foraminifera, radiolarians, calcareous nannofossils, and silicoflagellates. There is little evidence of bedding other than in slight variations of color. Preliminary microscopic examinations have not been able to relate the color differences to compositional variations. Colors are chiefly grayish-olive to light olive-gray, varying through shades of yellowish and light gray across color contacts that in most places are barely perceptible and in only three places sharp. The lithology appears uniform except for local concentrations of micarb of about 5% to 10% in the

TABLE 2
Lithologic Units, Site 265

Unit	Lithology	Subbottom Depth (m)	Unit Thickness (m)	Age
1	Clay-bearing diatom ooze	0-57	57	Pleistocene to Pliocene
2	Micarb-bearing diatom ooze, commonly nanno- and foram-bearing	57-342	285	
3	Clay-bearing diatom ooze	342-370	28	
4	Clay- and diatom-bearing nanno ooze: nanno chalk at base	370-445	75	Mid to late Miocene
5	Olivine-bearing pyroxene basalt	445-?	?	

highest part of Core 1 and near the base of Core 2, and a decrease in the amount of clay near the base of Core 3. X-ray data show the presence of barite in Section 2 of Core 2. Except for a single small lithic clast at a depth of 2.3 meters, clay and rare silt are the only probable terrigenous components. The clast, a subangular, grayish-black dense rock about 2 mm in size, is the only evidence for ice rafting encountered at this site.

Sedimentation rates for Unit 1 are in the vicinity of an extremely high 162 m/m.y.

Unit 2: Micarb-Bearing Diatom Ooze

Unit 2, comprising sediments of Cores 4-13, is conspicuously more varied in lithology and color than the clay-bearing diatom oozes of the overlying and underlying units. Unit 2 is characterized by its high degree of heterogeneity, comparative abundance of bedding, and general abundance of micarb and locally of forams and calcareous nannofossils mixed in the dominantly siliceous material. This unit is between 265 and 315 meters thick, between Cores 3 and 4 and between Cores 13 and 14.

Light olive to yellowish-gray and grayish-olive oozes predominate and are in sharp or gradational contacts with each other and with less common ooze having shades of very light to light gray and, rarely, pale yellowish-brown. Our studies suggest that lighter shades of gray and yellowish-gray are commonly associated with a relative abundance of forams and nannofossils in these sediments, whereas darker grays and olive-gray, as in a 0.6-meter thick bed near the top of Core 13, are commonly associated with sediments richer in clays. Bedding which reflects apparent grain-size change was observed only at the 4.2-meter level in Core 7. The sediments throughout the unit are soft and poorly consolidated.

Whereas the adjacent units above and below are nearly free of micarb, forams, and nannofossils, these calcareous materials are common throughout Unit 2 in amounts totaling about 15% or less. Forams and nannofossils constitute nearly 30% of the sediment in a 1-meter thick bed in the lower third of Core 5, in a 3.5-meter thick section in the lower half of Core 7, and in a 0.5-meter thick bed in the middle part of Core 8. The micarb consists of angular grains of carbonate ranging in size from 10μ down to the limit of resolution. Its origin is uncertain. In lithologies containing forams, it may in part be composed of comminuted foram tests; but in general, "micarb" appears more widely distributed than recognizable forams.

Shore-lab X-ray data show Units 1 and 2 to contain high montmorillonite/mica ratios; these are higher than in Unit 1 at Site 266. Sedimentation rates range from 11 to 162 m/m.y.

Unit 3: Clay-Bearing Diatom Ooze

Unit 3 is a light olive-gray, stiff, clay-bearing diatom ooze at least 9.5 meters and less than 58 meters thick which was encountered only in Core 14. Lithology is uniform, and the unit lacks any evidence of bedding such as changes in color. It appears very similar to Unit 1 except for its slightly greater degree of consolidation. Diatoms make up over 90% of the sediment, the remainder consisting chiefly of sponge spicules and clay with generally trace amounts of micarb and silicoflagellates. Mottling is locally developed near the base of Core 14. Sedimentation rates approximate 11 m/m.y.

Unit 4: Clay- and Diatom-Bearing Nanno Ooze

The basal sedimentary unit consists almost exclusively of white, stiff, clay- and diatom-bearing nanno ooze having a thickness of more than 46 meters and less than 75 meters. The calcareous nanno ooze appears uniform in color, texture, and degree of consolidation throughout Cores 15 and 16 except for faint but sharp changes to pinkish-gray color at about 6 meters in Core 15 and 0.7 meter in Core 16. There is no other evidence of bedding in the sediments. The sediments are semilithified to a poorly consolidated nanno chalk at the base just above basalt in Core 17. Clay decreases in abundance downward, ranging from a maximum of about 18% at 2 meters in Core 15 to a minimum of about 1% in Core 15, as confirmed by shore-lab $CaCO_3$ analysis. Calcareous nannofossils predominate in amounts between 75% and 90% in Core 15, and even more in the lower half of Core 16. Diatom content ranges from trace amounts in the lower part of Core 16 to a maximum of from 5% to 10% in the upper part of Core 15. Generally trace amounts of sponge spicules, forams, and radiolarians make up the remainder of the sediment. Sedimentation rates are in the vicinity of 11 m/m.y.

Unit 5: Olivine-Bearing Basalt

Although the basalt appears megascopically nearly uniform throughout both cores, variants can be seen microscopically. The basalt consists predominantly of about equal amounts of lath-shaped plagioclase and clinopyroxene (up to about 5%) of fresh to partly altered olivine, and with lesser amounts of iron oxides and unidentified alteration products mostly in interstices. The plagioclase is calcic labradorite to chiefly sodic bytownite (An_{70-75}), indicated by extinction angles in the range 36°-40° measured in abnormal sections. Normal zoning to thin rims of andesine is common. Moderately large optic angles indicate that the nonpleochroic pyroxene is probably an augite or subcalcic augite. Neither pigeonite nor hypersthene have been identified. The plagioclase and pyroxene are generally fresh.

The basalt is nonporphyritic and generally holocrystalline except near the top. Textures are mostly intergranular but vary to diktytaxitic where angular voids occur between plagioclase laths. In places, interstices are filled with a groundmass of an unusually textured, finely plumose intergrowth of pyroxene and plagioclase. Very similar feathery intergrowths of these minerals occur in mid-Atlantic Ridge basalts recovered on Leg 11 of DSDP and also in dredge hauls and have been interpreted to be the result of rapid quenching by seawater. Indistinct fragmental or detrital structures are present at about 0.6 meters in Core 17, suggesting the occurrence of flow-top or interflow breccias or reworked volcanic pebbly conglomerate.

The original contact between sediments and basalt was probably destroyed by drilling due to their great contrast in hardness. The lowest sedimentary material obtained is a white, poorly consolidated nanno chalk. The amount of sediment lost by drilling is unknown, but could be as much as 7 or 8 meters. Metamorphic alterations might be expected in water-soaked calcareous sediments even at this distance if the contact is intrusive. None, however, are observed in the chalk, and delicate structures in fossils are perfectly preserved. The contact of Unit 4 with the basalt is believed to be sedimentary rather than intrusive. This conclusion is supported by the possible presence of flow breccias or reworked volcanic materials and of glass and quench textures in the basalts, as well as the absence of contact metamorphic effects and of evidence of contamination of the basalt by calcareous sediments.

PHYSICAL PROPERTIES

Bulk-density determinations using the GRAPE technique and sonic-velocity measurements were made on nearly all cores obtained. Several porosity and additional independent bulk-density measurements were obtained from syringe samples. Those data obtained from the less disturbed core sections have been plotted (Figure 5). The following general observations are apparent. From the surface of the sediment to the base of the diatom ooze at about 280 meters subbottom, porosity decreases very slightly from about 86% to 82%. Associated with this porosity decrease is an increase in wet bulk density from 1.13 to 1.26 g/cc (syringe) and 1.20 to 1.25 g/cc (GRAPE). Some local variations in GRAPE densities appear to correlate with the varying amounts of clay and calcite content of the diatom ooze. Sonic velocities in the same interval vary between 1.47 and 1.51 km/sec with no obvious systematic trend.

At about 280 meters the lithology changes from diatom ooze to nanno ooze. The porosity decreases across this boundary from 82% to about 62% and wet bulk density increases from 1.25 to more than 1.50 g/cc. No noticeable change in sonic velocity is observed, however.

Several velocity measurements were made on hard rock samples contained in Cores 17 and 18. Velocities in basalt fragments ranged from 4.69 to 5.85 km/sec. Measurements in different directions on the same fragment yield significantly different velocities. The few data obtained suggest that the minimum velocity axis is vertical. A velocity of 3.99 was obtained for a fragment of indurated volcanic breccia.

Alkalinity, *p*H, and salinity data are summarized in Figure 3. Alkalinity is rather high, and shows a correlation with lithology. The mean value is 4.43 meq/kg in the siliceous part of the section, with lower values (mean 3.32 meq/kg) in the lower, calcareous part of the section. The *p*H, both flow-through and punch-in, is relatively constant in the siliceous part of the section, and decreases slightly in the calcareous part. Salinity is almost constant throughout the hole at values of 34.6 to 34.9.

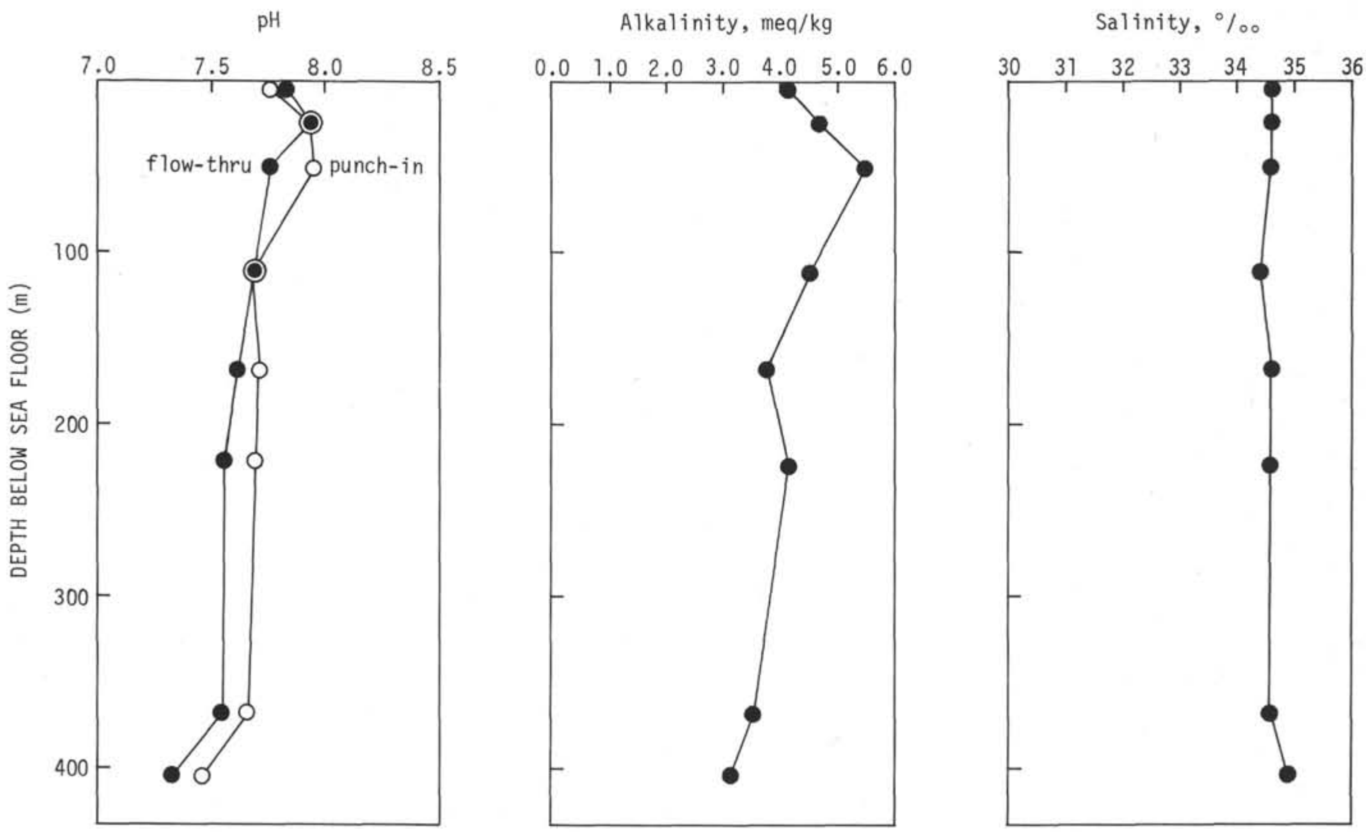


Figure 3. *Shipboard measurements of* pH, *alkalinity, salinity of sediment pore waters at Site 265.*

BIOSTRATIGRAPHIC SUMMARY

The ranges and occurrences of foraminifera, nannofossils, radiolarians, diatoms, and silicoflagellates overlap considerably in several areas of the section at Site 266. Foraminifera are generally sparse and occur only sporadically down the section. Considerable parts of the site (Cores 4 to 12, 15, 17 and 18) are barren of forams. Nannofossils are absent from Cores 1 to 9, but they are generally present below Core 9, becoming common to abundant in Cores 15 to 22. Radiolaria are common in Cores 1 to 9, but are rare and poorly preserved in the remainder of the section. Diatoms occur commonly throughout Cores 1 to 17; below this interval, however, preservation is poor and abundance is reduced to trace amounts.

Because there is a good area of overlap of ranges of the siliceous and calcareous microfossils at this site, this section is extremely important for correlation of age assignments and zonal schemes between the different microfossil groups. For this reason the ranges of microfossils at this site have been used as the basis of the microfossil correlation chart produced earlier in this volume.

Distribution of the various microfossil groups allows the sediments of this site to be subdivided as follows: Pleistocene: Cores 1-3; Pliocene: Cores 5-9.

The positioning of the Plio/Pleistocene boundary is within the area between the bottom of Core 3 and the top of Core 5. The actual position of the boundary differs slightly between the different siliceous organisms, and as no significant information can be given from calcareous microfossils, a section of core (bottom of Core 4) has been designated for the Plio/Pleistocene boundary.

At this site there is only a very short upper Miocene section (Core 10) followed by relatively long mid Miocene (Cores 11 to 17) and lower Miocene (Cores 17 to 22) sections. The lower Miocene sediments (Core 22) rest on basement.

There is some difference between the positioning of the middle/lower Miocene boundary on the basis of siliceous and calcareous microfossil distribution. However, the boundary based on calcareous microfossils has been selected, thus tying the boundary to previously described type sections. However, this controversy is dealt with in more detail elsewhere in this volume.

FORAMINIFERA

Planktonic foraminifera are present, but generally scarce, throughout most of the section at Site 265. Some intervals are barren, probably as a result of solution. All assemblages found are of very low diversity, the maximum number of species recorded in any one sample being five (Sample 9, CC).

Assemblages from the diatom oozes are dominated by left-coiling *Globorotalia pachyderma,* and in most samples it is the only foram species present. Right-coiling populations were not seen. *Globigerina bulloides* and *Globorotalia inflata* are sporadically present and *Globigerina quinqueloba* was seen in Core 7 and *Globorotalia crassaformis* in Core 9. Cores 7 and 9 also contain a variety of *G. inflata* with an axial periphery which is more angled than in the typical mid-latitude form; this is probably a geographical subspecies adapted to colder water environments.

The presence of *G. pachyderma* throughout the diatom ooze interval indicates an age of late Miocene or younger; on the basis of planktonic foraminifera, neither more precise age assignments nor a zonation of this interval are now feasible.

The nanno-ooze interval of Cores 15, 16, and 17 also contains low-diversity assemblages, in this case dominated by *Globigerina woodi woodi.* A form tentatively identified as *Globorotalia conica* is also present, and is common in Sample 15, CC. Also present throughout, but scarce, is *G. continuosa.* The chalk fragment from above basalt (Core 17) contained a specimen of ?*G. siakensis,* and a small specimen of *Catapsydrax* sp.

If the identification of *Globorotalia conica* is correct, then the age of the nanno-ooze interval is middle Miocene (equivalent to *Globorotalia mayeri* Zone or Zone N.14).

Nannofossils

The brownish-gray diatomaceous oozes sampled in the upper part of the section at Site 265 (Cores 1 to 4) are devoid of nannofossils, except for a few scattered horizons which contain rare assemblages. In these sporadic horizons nannofossil preservation is generally poor, although a few well-preserved specimens can be found occasionally. The nannofossils in such horizons give only approximate age indications (Pleistocene), but this age is not reliable as it is based on only a few specimens of diagnostic species. Species found in the nannofossil horizons include: *Emiliania huxleyi, Gephyrocapsa oceanica,* another smaller *Gephyrocapsa* sp. Other species such as *Cyclococcolithus leptoporus, Umbilicosphaera mirabilis, Helicopontosphaera kamptneri,* and *Coccolithus pelagicus* are present in small numbers or as single isolated specimens, although there are a few horizons in which *C. pelagicus* forms a relatively high proportion of the assemblage. Only one horizon was found in this upper part of the hole which contained abundant nannofossils (Sample 4-1, 30 cm); this assemblage was dominated by a small *Gephyrocapsa* sp.

The diatomaceous oozes sampled in the middle part of the section at Site 265 (Cores 5 to 14) generally all contained a small background assemblage of nannofossils. Species present include: *Gephyrocapsa oceanica, Cyclococcolithus leptoporus, Helicopontosphaera kamptneri, Cyclococcolithina macintyrei, Reticulofenestra pseudoumbilica.* A few specimens of *Discoaster asymmetricus* and *Discoaster brouweri* were found in Sample 13-3, 143 cm.

In the lower part of this site there is a marked change from gray siliceous ooze (Core 14) to white, stiff calcareous ooze (Core 15). This lithological change is accompanied by a change in microfossil content. Cores 15 to 17 contain common to abundant well-preserved nannofossils, but the assemblages have low diversities. Species commonly present include: *Cyclococcolithus lep-*

toporus, Coccolithus pelagicus, Reticulofenestra pseudoumbilica, Discoaster hamatus, D. variabilis, Coccolithus miopelagicus, Catinaster coalitus, Discoaster stellulus, D. pentaradiatus, D. cf. *moorei, D. deflandrei, Cyclicargolithus floridanus, Reticulofenestra* sp.

The sediments of this site can be stratigraphically subdivided: Pleistocene: Sample 1-1, 50 cm to Sample 9-5, 55 cm; Upper Pliocene: Sample 10-1, 60 to Sample 13-1, 60 cm; Lower Pliocene: Sample 13-2, 139 to Sample 14-6, 125 cm; Upper Miocene: Sample 15-1, 46 cm; Middle Miocene: Sample 15-2, 30 cm to Sample 16-6, 115 cm.

Radiolaria

Common, well to moderately preserved Radiolaria were recovered from the post-Miocene sediments (Cores 1 to 14), whereas few to common, moderately preserved Radiolaria occurred in the upper/middle Miocene sediments (Cores 15 and 16).

The Miocene/Pliocene boundary is located in the coring gap between Cores 14 and 15. Radiolarian zones represented are: Cores 1 to 3, the *Antarctissa denticulata* Zone; Core 4, the *Stylatractus universus* Zone; Core 5 to Core 10, Section 3, the *Saturnalis circularis* Zone; Sample 10, CC to Core 14, the *Helotholus vema* Zone; and Cores 15 and 16, the *Theocalyptra bicornis spongothorax* Zone. The *Eucyrtidium calvertense* Zone was not located at present, and it may be present at Core 10 between Section 3 and the core catcher.

No hiatus nor reworked Radiolaria were observed at this site.

Diatoms

Core-catcher samples from Cores 1 through 17 were examined for diatoms. Diatom preservation is fairly good in Cores 1 through 14 and poor in Cores 15 through 17.

Although no zonal boundaries were detected, portions of zones were found throughout the site. The *Coscinodiscus lentigenosus* Zone is found in Cores 1 through 3. The *Coscinodiscus elliptopora/Actinocyclus ingens* Zone is found in Cores 4 through 10. Cores 11 and 12 are not zoned because of poor recovery. Cores 13 and 14 contain a portion of the *Nitzschia interfrigidaria* Zone. Cores 15 and 16 contain a portion of the *Denticula hustedtii/Denticula lauta* Zone.

SUMMARY AND CONCLUSIONS

Site 265 is located about midway down the south flank of the Southeast Indian Ridge in a water depth of 3582 meters. The site occurs in a region characterized by small-scale rough topography which tends to parallel relief in the basement as seen in seismic profiles. On profiles from *Eltanin* 45 in this region and in the corresponding position on the north flank, the sediments display mound-like or "haystack" configurations, the thickest accumulations being centered above small basement highs (Frakes, 1971). Within the mostly transparent sediments, minor primary structure is revealed by discontinuous reflectors which often are draped in anticlinal form over the basement highs. Judging from the few seismic traverses run parallel to the ridge in which the apparent basement roughness is reduced and haystack forms are rare, it is likely that both basement and sediment fabric are elongate parallel to the ridge flank. The origin of these haystack structures is problematic, but may be related to winnowing of sediments in the topographic lows by bottom currents moving eastward along the ridge flank. Correlation between the seismic profile and the section cored at Site 265 is shown in Figure 4.

The origin of the features may be closely related to the processes that gave rise to the extraordinarily high accumulation rates in diatomaceous sediments at Site 265. The site, in part selected to examine the sedimentation history of a large area of thick sediments (Houtz and Markl, 1972), is underlain by about 444 meters of sediment, of which at least the upper 370 meters are made up of diatomaceous sediments of Pliocene and Quaternary age. The minimum sedimentation rate for all diatomaceous deposits here is about 97 m/m.y. and is extremely high when compared with "normal" rates for this type in the Southern Ocean (20-40 m/m.y.). Segments of the siliceous sequence accumulated at rates exceeding 130 m/m.y.

High accumulation rates for diatomaceous deposits may result from high productivity in the upper part of the water column, from a decrease in the rate of shallow dissolution of the microflora, or from concentrated deposition due to patterns of oceanic currents. There is no obvious independent evidence to support either a localized increase in productivity or a change in dissolution rates. However, a large area in which Pliocene and younger deposits are attenuated lies to the west of, and "upcurrent" from, Site 265; this includes the Kerguelen Plateau and a broad region lying to the east of it (Kaharoeddin, et al., 1973). Possibly, remains of microorganisms living in the upper water column have been swept eastward from this region (west of 95°E) by strong currents in the circumpolar system, eventually to reach the bottom in the region where the energy of the system is diminished as a portion turns northward along the Australian coast (east of 105°E). Thus thin sediment accumulation in the west may represent the effects of strong currents while thick sediments in the east may reflect less-active currents. In this tentative interpretation many of the siliceous microorganisms would have been transported over a latitudinal distance of 800-1000 km, during which time they would have settled through a water column of about 3500 meters. The areas exhibiting anomalously thick sediment are only about 200-500 km on a side, thus arguing against regional current patterns as the controlling factor.

Diatom-bearing nannofossil oozes and chalks at the bottom of the hole may be entirely of middle Miocene age, though biostratigraphic considerations allow the possibility of late Miocene in the top of Core 15. Assuming that the middle-late Miocene boundary occurs midway in Core 15 and also that the oldest sediment at the site is 13.5 m.y. old, a minimum sedimentation rate of 11 m/m.y. is calculated for the nannofossil-rich deposits, a moderately low rate compared to other Leg 28 sites. However, it is quite possible that an unconformity occurs between Pliocene strata in Core 14 and Miocene sediments in Core 15 (sedimentation rate, ~5

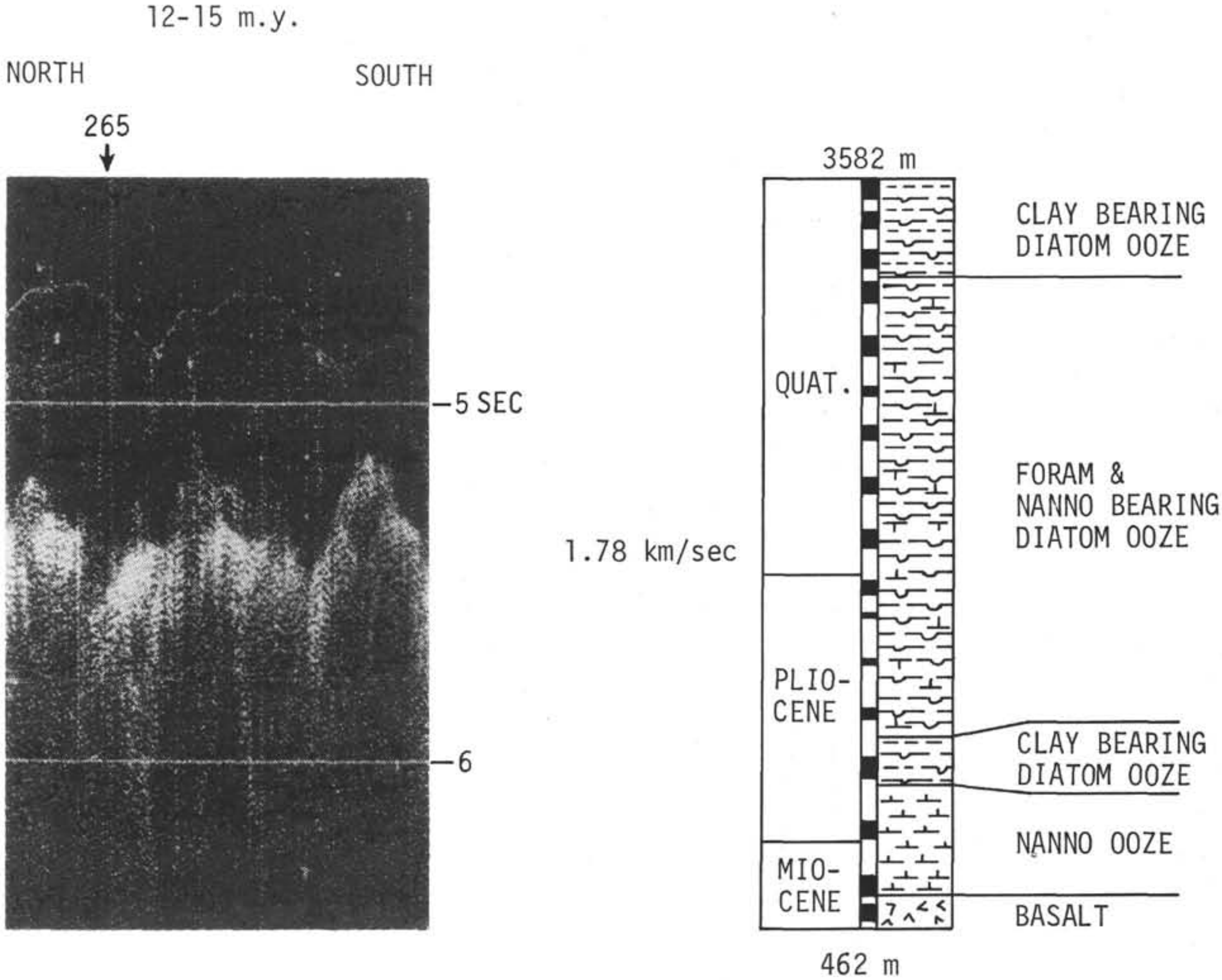


Figure 4. *Comparison of* Eltanin *49 seismic profile across Site 265 and the drilled section.*

m/m.y.), and may be an indication of a change in current regime near the beginning of the Pliocene.

The youngest nannofossil ooze at this site occurs in Core 15, Section 1 and the oldest diatom ooze in Core 14, Section 6. By extrapolated sedimentation rates these samples are dated at 10.3 m.y. and 4.1 m.y., respectively. The dramatic change from deposition of nannofossil sediments to diatomaceous ones may have taken place at any time within this interval.

Magnetic anomaly lineations are well defined in the region of Site 265 and the site appears to lie between anomalies 5 and 5B, indicating an age of 12-14 m.y. for oceanic basement. The age as determined by paleontology of the oldest sediment is middle Miocene (10.5-16 m.y.), in good agreement with the predicted age. That the basalt in Cores 17 and 18 is extrusive in origin is indicated by abundant vesicles and amygdules with devitrified glass at the top, by the presence of probable flow breccias, plumose intergrowths of pyroxene and plagioclase which fill interstices, and by well-preserved structures in microfossils within Core 17 sediments.

REFERENCES

Frakes, L. A., 1971. *Eltanin* cruise 45: Antarctic J. U.S., v. 6, p. 29-30.

Hays, J. D., 1965. Radiolaria and late Tertiary and Quaternary history of Antarctic seas. *In* Biology of the Antarctic Seas II: Antarctic Res. Ser., v. 5: Washington (Am. Geophys. Union), p. 125.

Houtz, R. E. and Markl, R. G., 1972. Seismic profiler data betwen Antarctica and Australia. *In* Hays, D. E. (Ed.), Antarctic Oceanology II, The Australian-New Zealand Sector, Antarctic Res. Ser., v. 19: Washington (Am. Geophys. Union), p. 147.

Kaharoeddin, F. A., Weaver, F. M., and Wise, S. W., Jr., 1973. Cretaceous and Paleogene cores from the Kerguelen Plateau, Southern Ocean: Antarctic J. U.S., v. 8, p. 297-298.

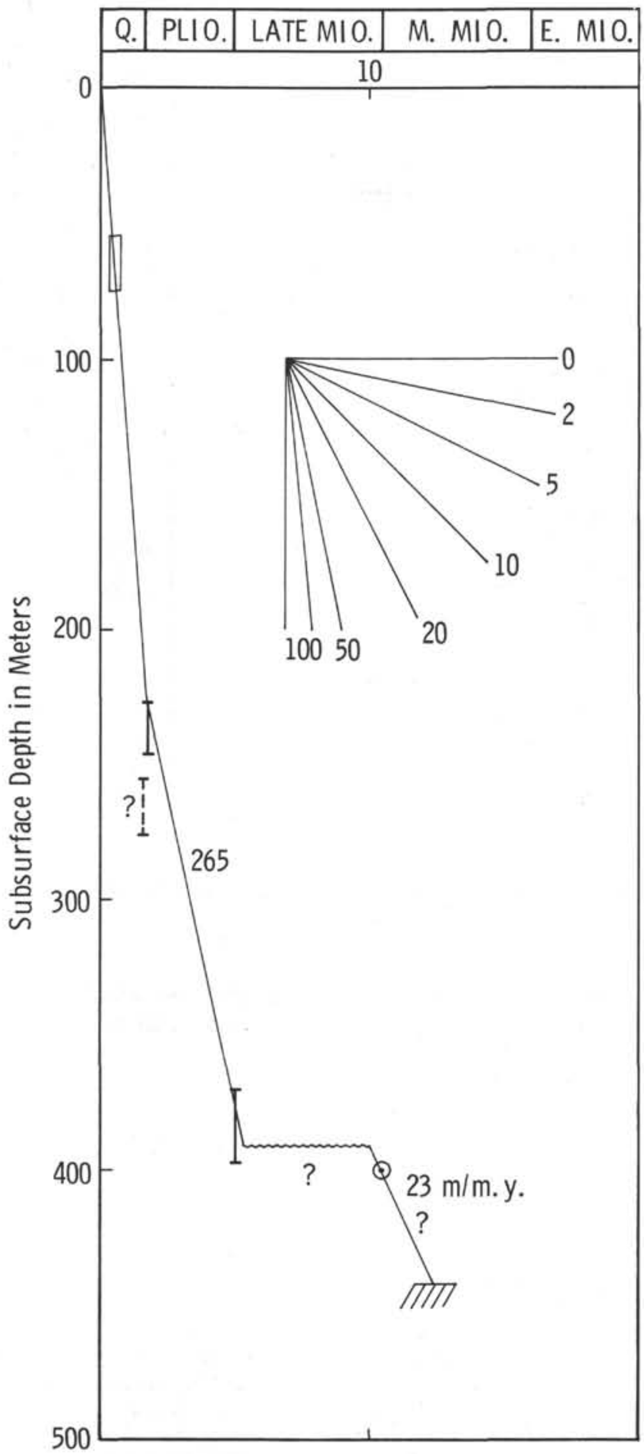


Figure 5. *Age vs. depth at Site 265.*

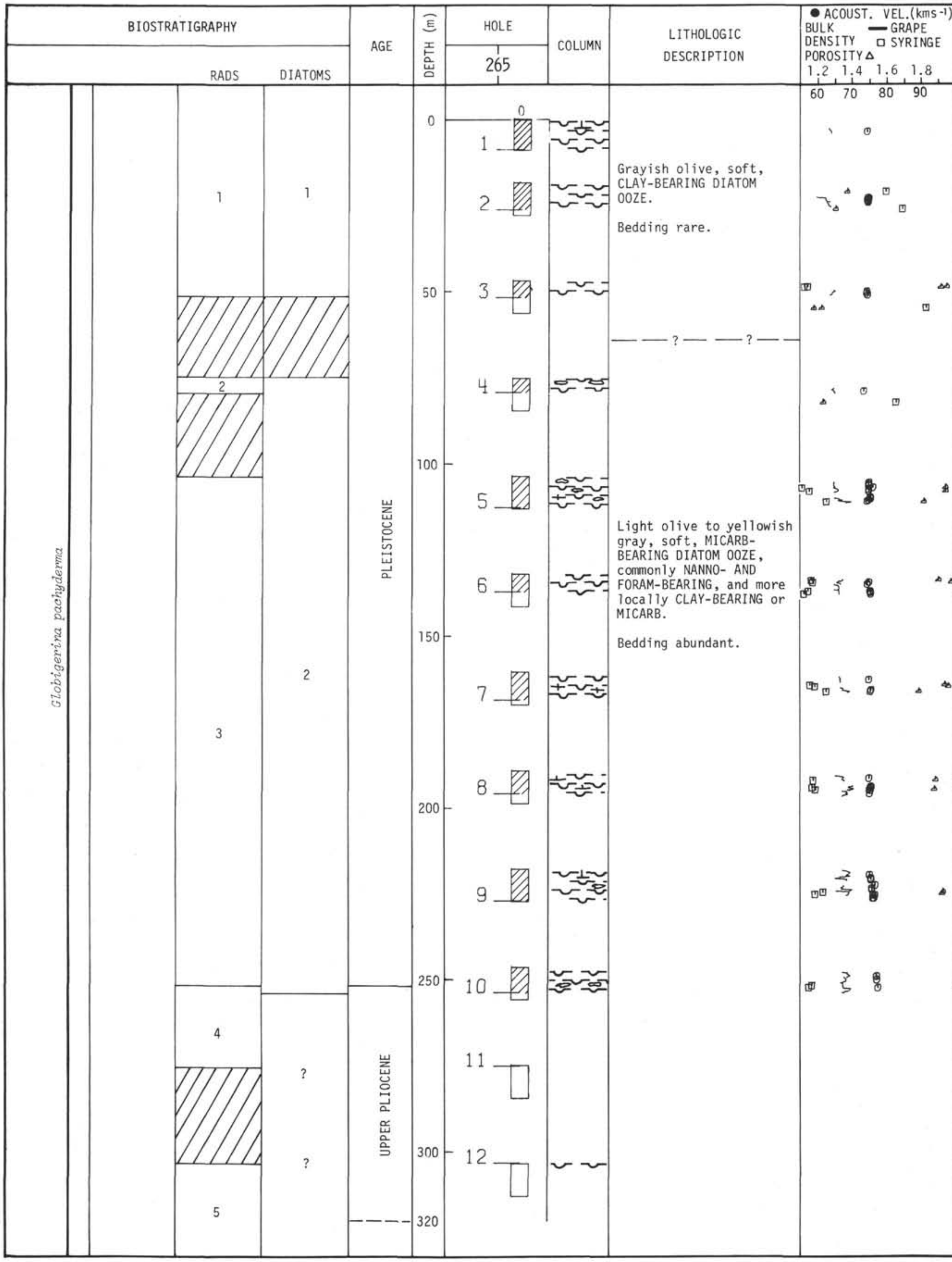


Figure 6. *Graphic hole summary, Site 265.*

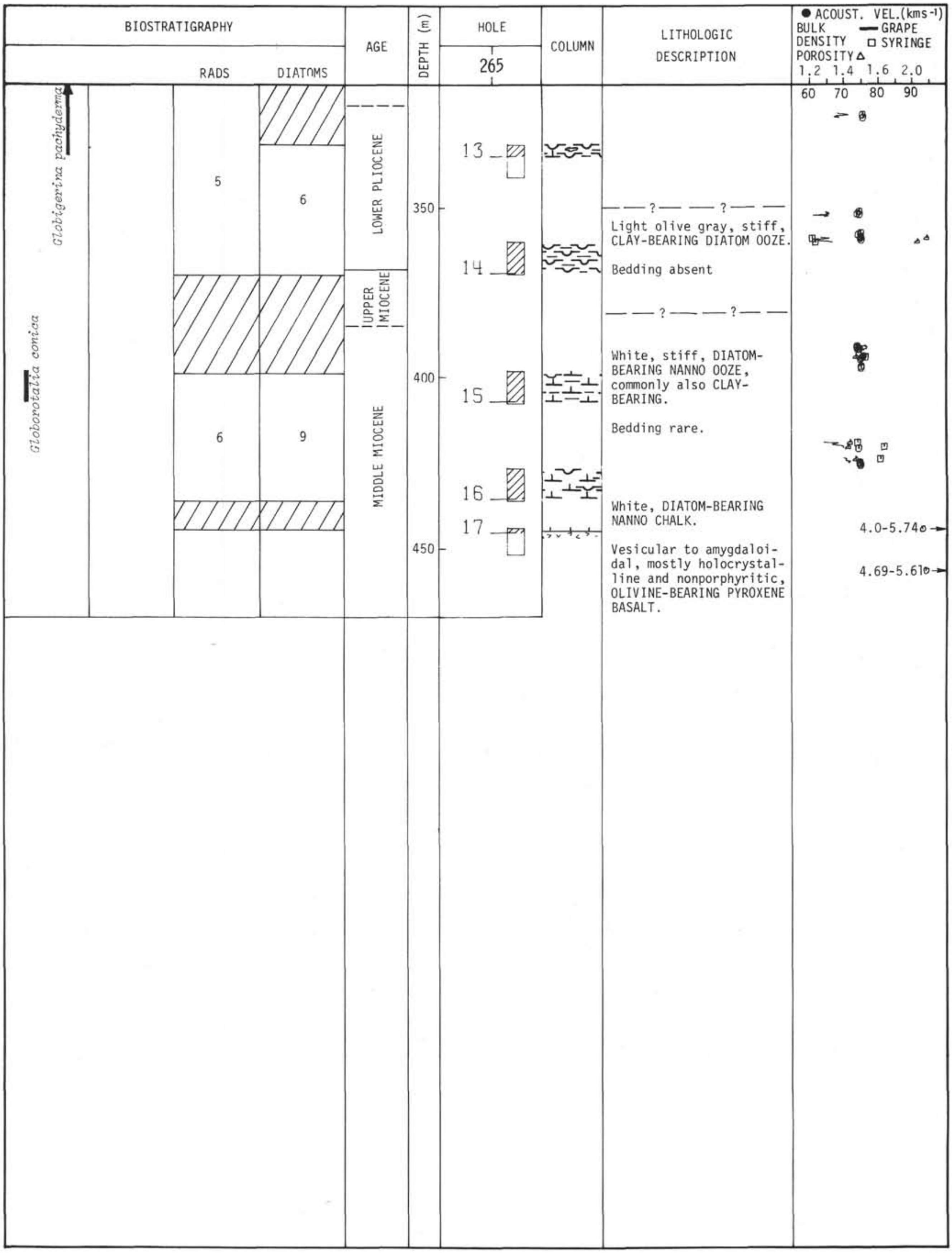


Figure 6. *(Continued)*.

Site 265 Hole Core 1 Cored Interval: 0-9 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
PLEISTOCENE	Emiliania huxleyi NN21	F N	R R	M M	1	0.5 1.0	S-M-DE		* CC *GZ	Grayish yellow (5Y 8/4), soupy, micarb- and clay-bearing DIATOM OOZE, uniform; sharp color contact at 113 cm of Sec. 1. Sec. 1 (80 cm): 85% diatoms 5% sponge spicules 5% carbonate 5% clay 1% forams
					2			V	* *	Grayish olive (10Y 4/2), soft, clay-bearing DIATOM OOZE, thinly bedded in upper 40 cm. At 80 cm of Sec. 2 dark grayish black, subangular lithic clast about 2 mm in size (dropped clast?). Sec. 2 (80 cm): 88% diatoms 5% sponge spicules 5% clay TR radiolarians
					3		S-DE		* GZ CC	Sec. 3 (100 cm): 85% diatoms 10% sponge spicules 5% clay
					4				*	Uniform lithology. Sec. 4 (100 cm): 90% diatoms 5% sponge spicules 5% detrital TR calc. nannofossils TR radiolarians TR silicoflagellates
					5		S-DE			soupy
					6				* CC GZ	
		D F R N	A R F R	G M G G	Core Catcher				*	

Site 265 Hole Core 2 Cored Interval: 18.5-28.0 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
PLEISTOCENE	Gephyrocapsa oceanica NN20				1	0.5 1.0	VOID S-DE	V	*	Light olive gray (5Y 5/2), soft, clay-bearing DIATOM OOZE, uniform lithology. Sec. 1 (140 cm): 90% diatoms 7% clay 3% sponge spicules Bulk X-ray (27.0 m): Amorph. - 51.4% Ident. - 48.6% Calc. - 92.4% Quar. - 0.5% K-Fe. - 1.3% Plag. - 1.4% Kaol. - 1.3% Mica - 1.8% Bari. - 1.4%
					2		S-DE		GZ CC	
					3			V	* **	Sec. 3 (90 cm): 89% diatoms 5% clay 5% sponge spicules
					4		S-DE		* WC * CC GZ * *	Sec. 4, 20-50 cm - slight mottling. Sec. 4 (90 cm): 88% diatoms 6% clay 4% sponge spicules 2% carbonate unspecified Sec. 5, 0-120 cm - local slight mottling
					5				*	Sec. 5, 120 cm - gradational, slight color change. Sec. 6, 70 cm - gradational color change. Sec. 6, 105 cm - sharp color change.
		N D	R A	P G	6		S-DE-M S-DE		* * GZ * *XM * XM	Very light gray (N8), soft, clay- and micarb-bearing DIATOM OOZE. Sec. 6 (100 cm): 80% diatoms 10% carbonate unspecified 5% clay 4% sponge spicules Sec. 6 (110 cm): 90% diatoms 5% sponge spicules 3% clay 2% carb. unspecified
		F R N	F BARREN	G	Core Catcher				*	

Explanatory notes in Chapter 1

Site 265 Hole Core 3 Cored Interval: 47-56.5 m

AGE	ZONE	FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE
					1	0.5, 1.0	S DE		*
					2		S DE		WC, CC GZ, *
					3		S		*, *, *
					4		S		*GZ CC, *
		D F R N	A - C BARREN	G - G	Core Catcher				

LITHOLOGIC DESCRIPTION

Grayish olive (10Y 4/2), soft, clay-bearing DIATOM OOZE, uniform lithology.

Sec. 1 (130 cm):
90% diatoms
5% sponge spicules
5% clay
TR carbonate unspecified

Sec. 2, 60-80 cm: gradational color change to yellowish gray (5Y 7/2).

Sec. 2 (100 cm):
90% diatoms
5% clay
3% sponge spicules
1% carbonate unspecified

Sec. 3, 0-40 cm, grayish olive (10Y 4/2); 60-85 cm, gradational color change to light olive gray (5Y 5/2); 85 cm, sharp color change to yellowish gray (5Y 7/2), soft DIATOM OOZE.

Sec. 3 (140 cm):
94% diatoms
5% sponge spicules
1% clay

Sec. 3, 0-55 cm, thin, indistinct bedding; 55-90 cm, becomes grayish olive (10Y 4/2); 90-150 cm, becomes dusky yellow (5Y 6/4) and free of clay.

Sec. 4 (140 cm):
95% diatoms
5% sponge spicules
TR clay

Site 265 Hole Core 4 Cored Interval: 75.5-85.0 m

AGE	ZONE	FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE
PLEISTOCENE	Gephyrocapsa oceanica NN20	N	A	G	1	0.5, 1.0	S, S DE	V	*, *, *
					2		S, DE, S, S	? = ?	*GZ CC
					3		S M DE		*
		D F R N	A R C R	G M G G	Core Catcher				

LITHOLOGIC DESCRIPTION

Very light gray (N8), soft, micarb-bearing DIATOM OOZE. Sec. 1, 35 cm, sharp color contact.

Sec. 1 (30 cm):
80% diatoms
10% carbonate
5% clay
5% sponge spicules

Olive gray (5Y 3/2), soft, DIATOM OOZE.

Sec. 2 (20 cm):
90% diatoms
5% sponge spicules
3% clay
2% carbonate unspecified

Sec. 2, 80 cm, gradational color contact to light olive gray (5Y 5/2), indistinct bedding 0.5-10 cm thick.

Yellowish gray (5Y 7/2), soft, micarb-bearing DIATOM OOZE.

Sec. 3 (40 cm):
90% diatoms
5% sponge spicules
5% carbonate
3% clay?

Explanatory notes in Chapter 1

Site 265 Hole Core 5 Cored Interval: 104-113.5 m

AGE	ZONE	FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE
PLEISTOCENE	Pseudoemiliania lacunosa NN19	N	R	P	1	0.5 1.0	M S DE; M S DE; S		* * * CC CC GZ XM
					2		S		* * *
					3		? ?; S M; S		WC CC * * GZ CC * WC * *
		N	R	G	4		S DE; M S; ? ?		*
		N	R	M	5		S		* CC WC * WC * XM GZ
		F	C	M					
					6		S; S		* * *
		D	A	G	Core Catcher		S		*
		F	R	M					
		R	C	G					
		N	BARREN						

LITHOLOGIC DESCRIPTION

Light gray (N7), soft, micarb-bearing DIATOM OOZE.

Yellowish gray (5Y 7/2), soft, micarb-bearing DIATOM OOZE.

Sec. 1 (20 cm):
82% diatoms
7% carbonate
5% sponge spicules
3% clay
2% nannofossils
1% foraminifera

Light olive gray (5Y 5/2) DIATOM OOZE with few interbeds in highest part of dusky yellow green (5GY 5/2) ooze; beds approximately 1 cm thick, becomes micarb-bearing (no visible changes in core).

Sec. 2 (40 cm):
95% diatoms
5% sponge spicules
1% clay
TR carbonate unspecified

Sec. 2 (120 cm):
5% carbonate

No contact visible, above lithology grades(?) down to grayish olive (10Y 4/2), soft, micarb-bearing DIATOM OOZE.

Sec. 3 (40 cm):
85% diatoms
6% carbonate
5% sponge spicules
2% clay

Sec. 3 (140 cm):
90% diatoms
5% sponge spicules
3% clay
2% carbonate

Sec. 3 (65 cm): few opaque spheroids(?). Sec. 3 (120 cm): gradational color contact.

Light olive gray (5Y 5/2), soft DIATOM OOZE, becoming clay-bearing in Sec. 4. Sec. 4 (70 cm): gradational contact.

Yellowish gray (5Y 7/2), soft, micarb-rich DIATOM OOZE.

Bulk X-ray (111.3 m):

Amorph.	82.6%	Kaol.	3.8%
Ident.	17.4%	Mica	10.3%
Quar.	11.0%	Mont.	25.4%
K-Fe.	11.7%	Pyri.	1.9%
Plag.	24.5%	Augi.	11.4%

Sec. 4 (110 cm):
75% diatoms
15% carbonate
5% sponge spicules
3% clay?
2% foraminifera

Yellowish gray (5Y 7/2), soft, nannofossil-bearing foram-rich DIATOM OOZE, becomes micarb-bearing DIATOM OOZE at base.

Sec. 5 (108 cm): sharp color contact.

Sec. 5 (60 cm):
65% diatoms
15% forams
10% nannofossils
5% sponge spicules
2% clay
1% radiolarians

Grayish olive (10Y 4/2), soft, DIATOM OOZE olive gray (5Y 3/2) and CLAY BEARING in upper 40 cm; indistinct beds approximately 2 cm thick, yellowish gray in color, in lower 20 cm of unit.

Sec. 6 (100 cm):
93% diatoms
5% sponge spicules
1% clay
1% carbonate unspecified

Approximately 4% clay in DIATOM OOZE.

Site 265 Hole Core 6 Cored Interval: 132.5-142.0 m

AGE	ZONE	FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE
					1	0.5 1.0	VOID; S DE	V	*
					2		S		WC * CC GZ * WC *
					3		S		* * XM *
		R	F	G	4				* WC
		R	F	G					CC * GZ WC
		F	—	—	Core Catcher		S		*
		D	A	G					
		N	BARREN						

LITHOLOGIC DESCRIPTION

Light olive gray (5Y 5/2), soft DIATOM OOZE.

Olive gray (5Y 3/2), soft, clay-bearing DIATOM OOZE.
Sec. 1 (106 cm): sharp color contact.

Sec. 1 (135 cm):
90% diatoms
5% sponge spicules
4% clay
1% carbonate

Sec. 2 (80 cm): sharp color contact.

Light olive gray (5Y 5/2), soft, DIATOM OOZE.

Sec. 2 (110 cm): gradational color contact.

Grayish olive (10Y 4/2), soft, DIATOM OOZE.

Several thin beds, about 1 cm thick at a number of levels.

Sec. 3 (80 cm):
90% diatoms
5% sponge spicules
2% clay
1% carbonate

Sec. 4 (90 cm): slight, gradational color contact.
Light olive gray (5Y 6/1), soft DIATOM OOZE.

Yellowish gray (5Y 7/2), soft, DIATOM OOZE.

Sec. CC
90% diatoms
5% silicoflagellates
2% clay
1% carbonate

Explanatory notes in Chapter 1

Site 265 Hole Core 7 Cored Interval: 161-170.5 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE
PLEISTOCENE	Pseudoemiliania lacunosa NN19	N	R	P	1–6	0.5, 1.0	VOID; S M; S M; S M N; F S; F S; N M S; N F	V	* CC GZ WC HC XM
		D F R N	P C F R	G M G M	Core Catcher				*

LITHOLOGIC DESCRIPTION

Dark greenish gray (5GY 4/1), soft, micarb-bearing DIATOM OOZE; varies to olive gray (5Y 4/1) in Sec. 2, lightening faintly to base of Sec.; thin, few mm thick, streaked-out beds through Sec. 2.

Sec. 1 (110 cm):
85% diatoms
7% carbonate
5% sponge spicules
3% clay

Sec. 2 (120 cm):
88% diatoms
5% sponge spicules
4% carbonate
2% clay
1% calc. nannofossils

Sec. 3 (30-50 cm): gradational color contact.

Light olive gray (5Y 6/1), soft, micarb- and nanno-bearing DIATOM OOZE (grain size increase near base (?)).

Sec. 3 (110 cm):
80% diatoms
8% calc. nannofossils
5% sponge spicules
4% carbonate
2% clay

Sec. 3 (123 cm): sharp color contact.
Olive gray (5Y 4/1), soft, DIATOM OOZE.

Sec. 3 (135 cm): sharp color contact.
Light olive gray (5Y 6/1), soft, foram-bearing NANNO-DIATOM OOZE.

Bulk X-ray (166.7 m):

Amorph.	- 65.3%
Ident.	- 34.7%
Calc.	- 99.0%
Quar.	- 1.0%

Sec. 4 (40 cm):
65% diatoms
25% calc. nannofossils
5% sponge spicules
3% foraminifera

Sec. 3 (45-53 cm): bed of yellowish gray (5Y 7/2) ooze.
Sec. 5 (102 cm): sharp but faint color contact, yellowish gray (5Y 7/2) foram-bearing NANNO-DIATOM OOZE.

Sec. 5 (30 cm):
60% diatoms
30% calc. nannofossils
5% sponge spicules
3% foraminifera
2% clay

Sec. 5 (110 cm):
60% diatoms
25% calc. nannofossils
5% sponge spicules
3% foraminifera
2% carbonate
3% clay?

Sec. 6 (60 cm): sharp color contact. Light olive gray (5Y 5/2), soft, nanno-rich DIATOM OOZE.
Sec. 6 (110 cm): sharp color contact. Olive gray (5Y 3/2), soft DIATOM OOZE.
Sec. 6 (132 cm): sharp color contact. Yellowish gray (5Y 7/2), soft nanno-and foram-bearing DIATOM OOZE.

Sec. 6 (85 cm):
70% diatoms
12% calc. nannofossils
8% carbonate
5% sponge spicules

Sec. 6 (140 cm):
80% diatoms
9% calc. nannofossils
5% foraminifera
5% sponge spicules

Site 265 Hole Core 8 Cored Interval: 189.5-199 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE
PLEISTOCENE	Pseudoemiliania lacunosa NN19				1–5	0.5, 1.0	VOID; M N S; M N S; N; N; M S; S; N M S; M S	V	* CC WC GZ XM
		D F R N	P C F R	G M G P	Core Catcher				

LITHOLOGIC DESCRIPTION

Sec. 1 (70-88 cm): Olive gray (5Y 3/2), soft, DIATOM OOZE - 88 cm - sharp color contact.

Yellowish gray (5Y 7/2), soft, micarb- and nanno-bearing DIATOM OOZE light olive gray near top.

Sec. 2 (80 cm):
80% diatoms
7% carbonate
5% sponge spicules
4% calc. nannofossils

Grades into NANNO-DIATOM OOZE locally, no visible contacts.

Sec. 3 (135 cm):
65% diatoms
25% calc. nannofossils
5% sponge spicules
3% foraminifera

Sec. 4 (32 cm): sharp color contact. Light olive gray (5Y 5/2), soft, micarb-bearing DIATOM OOZE.

Sec. 4 (70 cm): sharp color contact. Olive gray (5Y 3/2), soft, DIATOM OOZE.

Sec. 4 (80 cm):
93% diatoms
5% sponge spicules
3% clay
1% carbonate
1% calc. nannofossils

Sec. 4 (140 cm): sharp, faint color contact. Light olive gray (5Y 5/2), soft, nanno-micarb-bearing DIATOM OOZE.

Sec. 5 (20 cm): sharp color contact. Grayish olive (10Y 4/2), soft, micarb-bearing DIATOM OOZE.

Sec. 5 (80 cm):
90% diatoms
4% carbonate
4% sponge spicules
2% clay

Sec. 5 (130 cm): trace nannofossils.

Explanatory notes in Chapter 1

Site 265 Hole Core 9 Cored Interval: 218-227.5 m

AGE: PLEISTOCENE

ZONE: Pseudoemiliania lacunosa NN19

Core Catcher — FOSSIL: D, F, R, N; ABUND.: P, C, C, F; PRES.: G, M, G, M

LITHOLOGIC DESCRIPTION

Light olive gray (5Y 6/1), soft, micarb-nanno-bearing DIATOM OOZE.

Sec. 1 (40 cm): gradational color contact.

Olive gray (5Y 4/1), soft, micarb-bearing DIATOM OOZE, becomes grayish olive (10Y 4/2).

Sec. 1 (120 cm):
85% diatoms
6% carbonate
5% sponge spicules
3% calc. nannofossils

Sec. 2 (80-90 cm): indistinct, gradational bedding.

Sec. 2 (95 cm):
85% diatoms
6% carbonate
5% sponge spicules
2% calc. nannofossils

Sec. 3 (40 cm): gradation color contact.

Light olive gray (5Y 5/2), soft, micarb-bearing DIATOM OOZE.

Sec. 3 (140 cm):
90% diatoms
5% sponge spicules
4% carbonate unspecified
1% calc. nannofossils

Sec. 4 (105-108 cm): layer of light gray (N7), soft NANNO-DIATOM OOZE with 30% calc. nannofossils.

Sec. 4 (135 cm): sharp color contact.

Olive gray (5Y 3/2) DIATOM OOZE.

Sec. 5 (50 cm):
95% diatoms
5% sponge spicules
1% clay
TR carbonate
TR calc. nannofossils

Pale yellowish brown (10YR 6/2), soft, DIATOM OOZE.

Sec. 6 (75 cm): gradational color contact.

Light olive gray (5Y 6/1), soft, micarb-rich, DIATOM OOZE.

Sec. 6 (135 cm):
70% diatoms
20% carbonate
5% sponge spicules
3% calc. nannofossils
1% foraminifera

Site 265 Hole Core 10 Cored Interval: 246.5-256 m

Section 5 — FOSSIL: R; ABUND.: C; PRES.: G

Core Catcher — FOSSIL: D, F, N; ABUND.: P, R, BARREN; PRES.: M, M

LITHOLOGIC DESCRIPTION

Medium light gray (N6), soft, DIATOM OOZE.
Sec. 1 (34 cm): becomes grayish olive (10Y 4/2).
Sec. 1 (78 cm): sharp color contact.

Yellowish gray (5Y 7/2), soft, micarb-bearing, DIATOM OOZE.

Sec. 1 (110 cm): gradational color contact.

Sec. 1 (50 cm):	Sec. 1 (130 cm):
90% diatoms	87% diatoms
5% sponge spicules	6% carbonate
1% carbonate	5% sponge spicules
1% clay	1% calc. nannofossils

Grayish olive (10Y 4/2), soft, micarb-bearing DIATOM OOZE.
Sec. 2 (20 cm): gradational color contact.

Very light gray (N8), soft, micarb-rich DIATOM OOZE, grades downward into micarb- and nanno-rich DIATOM OOZE by 130 cm level.

Sec. 2 (70 cm):	Sec. 2 (130 cm):
70% diatoms	60% diatoms
15% carbonate	20% carbonate
10% calc. nannofossils	15% calc. nannofossils
5% sponge spicules	5% sponge spicules

Sec. 3 (15 cm): gradational color contact.

Light olive gray (5Y 5/2), soft, micarb-bearing DIATOM OOZE.

Sec. 3 (100 cm): gradational color contact.

Sec. 3 (55cm):
80% diatoms
8% carbonate
5% sponge spicules
3% clay?
2% calc. nannofossils

Yellowish gray (5Y 7/2), soft, micarb-bearing DIATOM OOZE grades downward to micarb-rich ooze at 120 cm level; no visible contact.

Sec. 4 (120 cm):
75% diatoms
17% carbonate
5% sponge spicules
3% calc. nannofossils

Sec. 5 (0-15 cm): Light olive gray (5Y 5/2).
Sec. 5 (15 cm): gradational color contact.

Olive gray (5Y 3/2).

Sec. 5 (100 cm): gradational contact

Light olive gray (5Y 5/2), soft, DIATOM OOZE.

Explanatory notes in Chapter 1

Site 265 Hole Core 11 Cored Interval: 275.0-284.5 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE
PLIOCENE		R	C	G	1	0.5, 1.0	VOID	V	*
		D R N	P C –	M G –	Core Catcher				*

LITHOLOGIC DESCRIPTION

Light olive gray (5Y 5/2), soft, micarb-bearing DIATOM OOZE.

Sec. 1 (140 cm):
90% diatoms
5% sponge spicules
5% carbonate
TR nannofossils

Micarb-bearing DIATOM OOZE.

Sec. CC:
82% diatoms
12% carbonate
5% sponge spicules
TR foraminifera

Site 265 Hole Core 12 Cored Interval: 303.5-313.0 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE
		R D N	C P	G M	Core Catcher				*

LITHOLOGIC DESCRIPTION

Micarb-bearing DIATOM OOZE.

Sec. CC:
90% diatoms
5% sponge spicules
4% carbonate
3% clay

Site 265 Hole Core 13 Cored Interval: 332.0-341.5 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE
LOWER PLIOCENE					1	0.5, 1.0	M S DE DE DE S		* *XM * GZ *CC * * *
					2		VOID	V	
							M DE S		* *
					3		VOID	V	
							M DE DE M		* *WC *CC *GZ *
		D F R N	P R C	P M G	Core Catcher				*

LITHOLOGIC DESCRIPTION

10% clay
10% silt

Grayish olive (10Y 4/2), stiff, micarb-rich DIATOM OOZE.
Sec. 1 (8 cm): sharp contact.
Olive gray (5Y 3/2), stiff, silt- and clay-bearing DIATOM OOZE, terrigenous material rich.
Sec. 1 (70 cm): sharp color contact.

Grayish olive (10Y 4/2), stiff, DIATOM OOZE; terrigenous material decreases downward.

Sec. 1 (105 cm):
89% diatoms
5% sponge spicules
5% clay
1% carbonate

Grayish olive (10Y 4/2), stiff, micarb-bearing DIATOM OOZE.
Sec. 2 (135 cm): gradational color contact to medium light gray (N6).

Sec. 2 (140 cm):
70% diatoms
12% carbonate
5% sponge spicules
5% clay
5% silt

Medium gray (N5), stiff, micarb-rich DIATOM OOZE locally nanno-bearing.
Sec. 3 (113 cm): sharp color contact.
Sec. 3 (127-131 cm): yellowish brown layer.
5 to 10% clay & silt

Micarb-bearing DIATOM OOZE.

Sec. CC:
80% diatoms
8% carbonate unspecified
5% sponge spicules
3% calc. nannofossils
3% clay?
1% foraminifera

Explanatory notes in Chapter 1

Site 265 Hole Core 14 Cored Interval: 360.5-370.0 m

AGE: LOWER PLIOCENE

ZONE: Reticulofenestra pseudoumbilica NN15

FOSSIL CHARACTER (Core Catcher): FOSSIL D F R N; ABUND. P R C F; PRES. G P G P

LITHOLOGIC DESCRIPTION

Light olive gray (5Y 5/2), stiff, clay-bearing DIATOM OOZE; recovered parts of entire core uniform appearing, and no bedding or contacts visible.

Sec. 2 (30 cm):
90% diatoms
5% sponge spicules
3% clay
1% carbonate
1% silicoflagellates

approximately same composition as above

approximately same composition as above

approximately same composition as above

approximately same composition as above

mottled in places

Bulk X-ray (369.3 m):	
Amorph.	- 92.9%
Ident.	- 7.1%
Quar.	- 19.4%
K-Fe.	- 17.6%
Plag.	- 21.2%
Kaol.	- 3.5%
Mica	- 27.3%
Mont.	- 11.1%

Site 265 Hole Core 15 Cored Interval: 398.5-408.0 m

AGE: MIDDLE MIOCENE

ZONE: ?

FOSSIL CHARACTER (Section 1): N C M; (Core Catcher): FOSSIL D F R N; ABUND. P R C C; PRES. P M G M

LITHOLOGIC DESCRIPTION

White (N9), stiff, diatom-bearing NANNO OOZE; nearly uniform throughout; little bedding.

Clay rich at 70 cm of Sec. 2.

10-50 cm, soft

Sec. 2 (70 cm):
75% calc. nannofossils
18% clay
5% diatoms
1% sponge spicules
TR foraminifera

Clay-bearing at 75 cm of Sec. 3.

Sec. 3 (75 cm):
80% nannofossils
10% diatoms
10% clay

Sec. 4 (73 cm): sharp color contact.

Pinkish gray (5YR 8/1), stiff, clay- and diatom-bearing NANNO OOZE; becomes white (N9) in Sec. 5; no contact seen.

Sec. 5 (50 cm):
90% nannofossils
4% diatoms
4% clay
TR radiolarians
TR sponge spicules

110-150 cm, soft

Bulk X-ray (403.8 m):	
Amorph.	- 19.8%
Ident.	- 80.2%
Calc.	- 98.7%
Quar.	- 1.3%

Explanatory notes in Chapter 1

Site 265 Hole Core 16 Cored Interval: 427.0-436.5 m

AGE	ZONE	FOSSIL	ABUND.	PRES.	SECTION	LITHO. SAMPLE
MIDDLE MIOCENE	?				1	CC, *, *, GZ, WC
					2	*, WC, CC, *
					3	GZ
					4 (VOID; V)	*
					5	WC, *, WC, CC
					6	*, GZ
		D F R N	P R C C	P M G M	Core Catcher	

LITHOLOGIC DESCRIPTION

White (N9), stiff, NANNOFOSSIL OOZE.

Sec. 1 (62-70 cm): layer of pinkish gray (5YR 8/1), stiff, diatom-bearing NANNOFOSSIL OOZE.

White (N9), stiff, NANNOFOSSIL OOZE, in places with minor clay and diatoms, generally 1-2% or less; uniform lithology; little evidence of bedding.

Sec. 2 (130 cm):
94% calc. nannofossils
3% clay
3% diatoms

Sec. 4 (110 cm):
97% calc. nannofossils
1% diatoms
1% sponge spicules
1% clay

Sec. 5 (75 cm):
98% calc. nannofossils
1% clay
TR diatoms

Site 265 Hole Core 17 Cored Interval: 444.5-452.5 m

AGE	ZONE	FOSSIL	ABUND.	PRES.	SECTION
MIDDLE MIOCENE		F R D N	R F P C	P G P M	1
					Core Catcher

LITHOLOGIC DESCRIPTION

contact at 5 cm
White to very light gray (N9-N8) diatom-bearing NANNOFOSSIL CHALK.

Dense, grayish black, nonporphyritic BASALT, in places vesicular to carbonate-filled amygdaloidal; local thin volcanic conglomerate at breccia (flow-top debris?).

Augite BASALT, see description above. Plagioclase about An_{75} (ext. angle, ⊥ a, = 38°).

Site 265 Hole Core 18 Cored Interval: 452.5-462 m

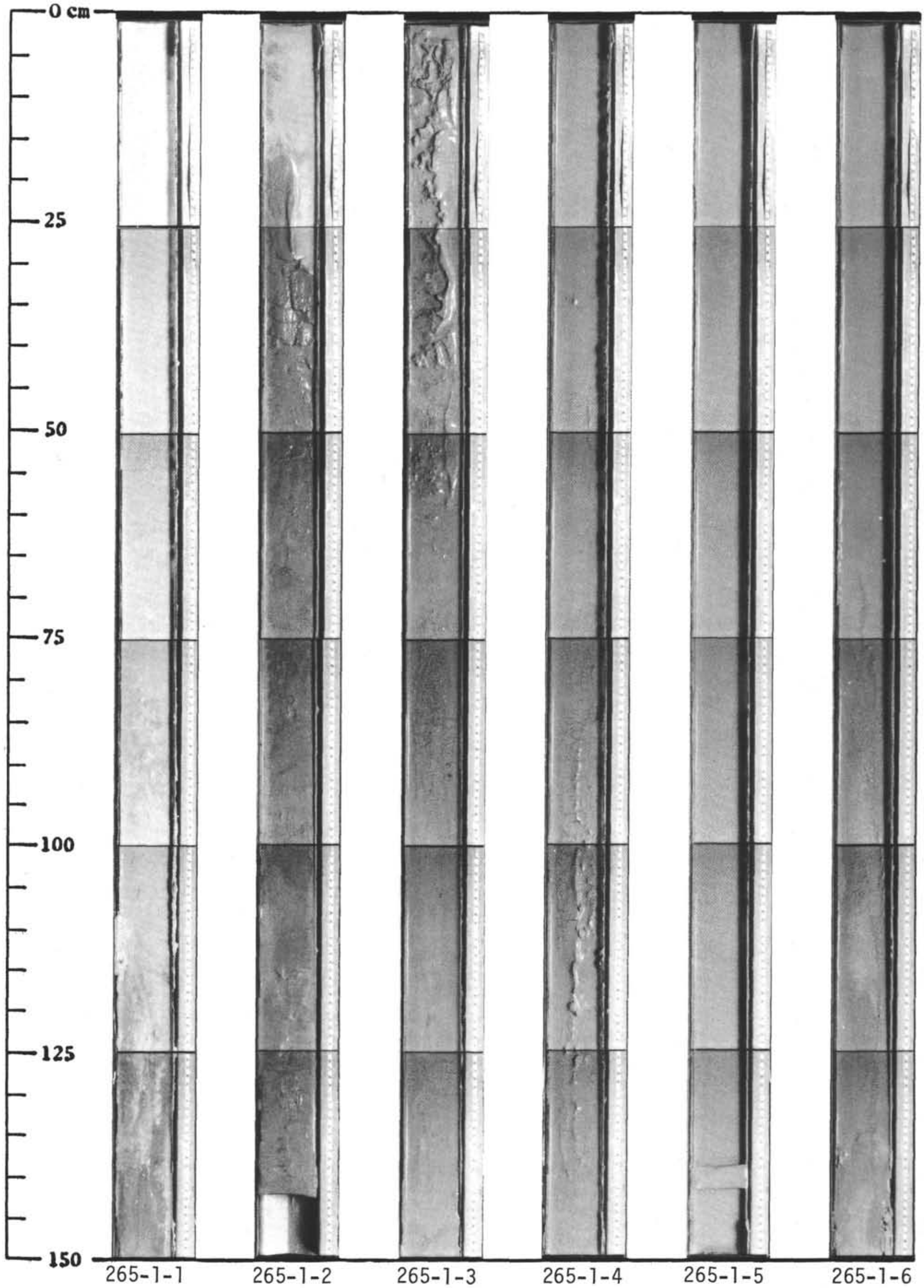
AGE	ZONE	FOSSIL	ABUND.	PRES.	SECTION	LITHOLOGY
					1	VOID
					2	
					Core Catcher	

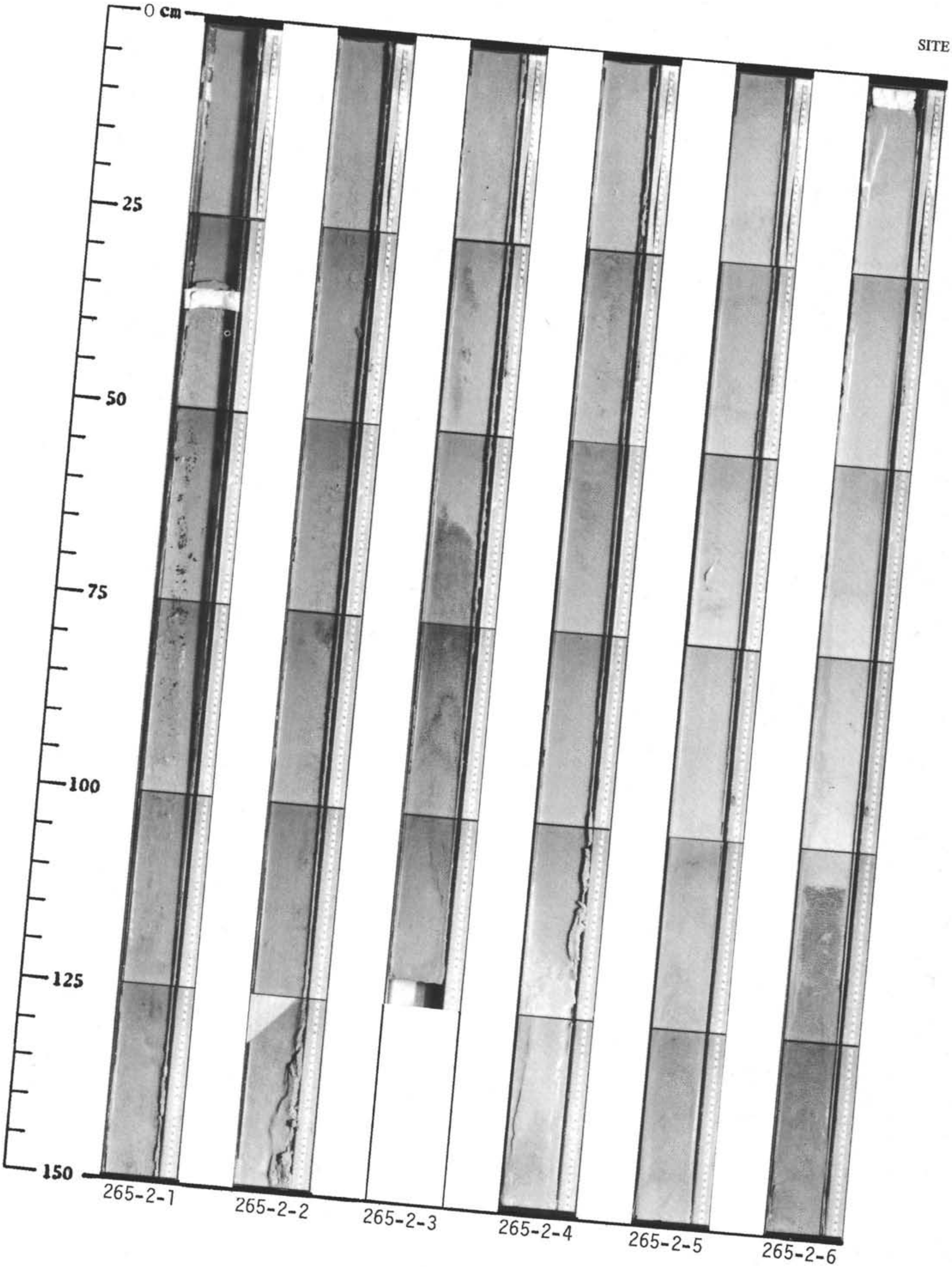
LITHOLOGIC DESCRIPTION

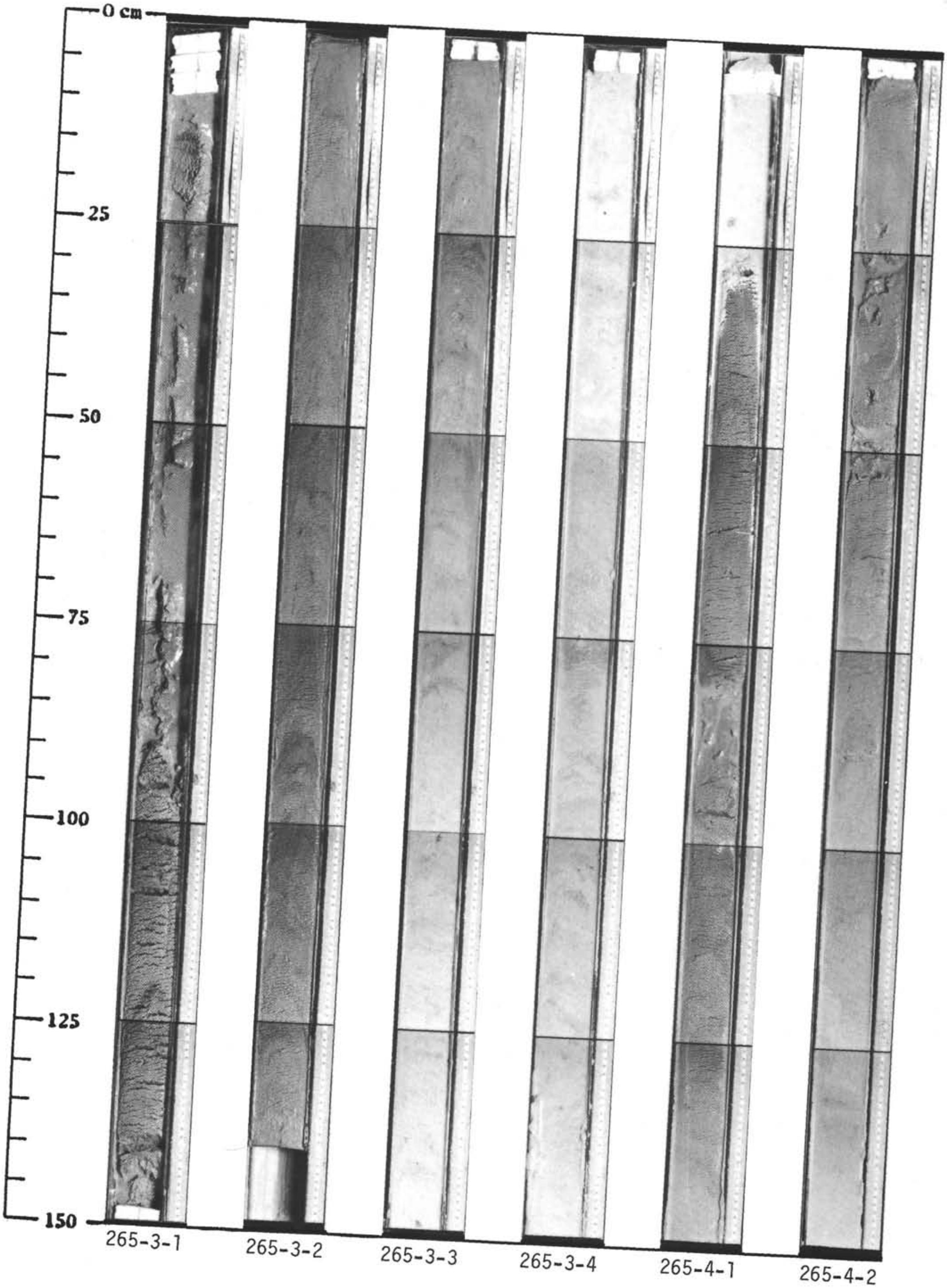
BASALT, see description above. Appears uniform, except for amygdules which seem to increase in size and number here compared to Core 17.

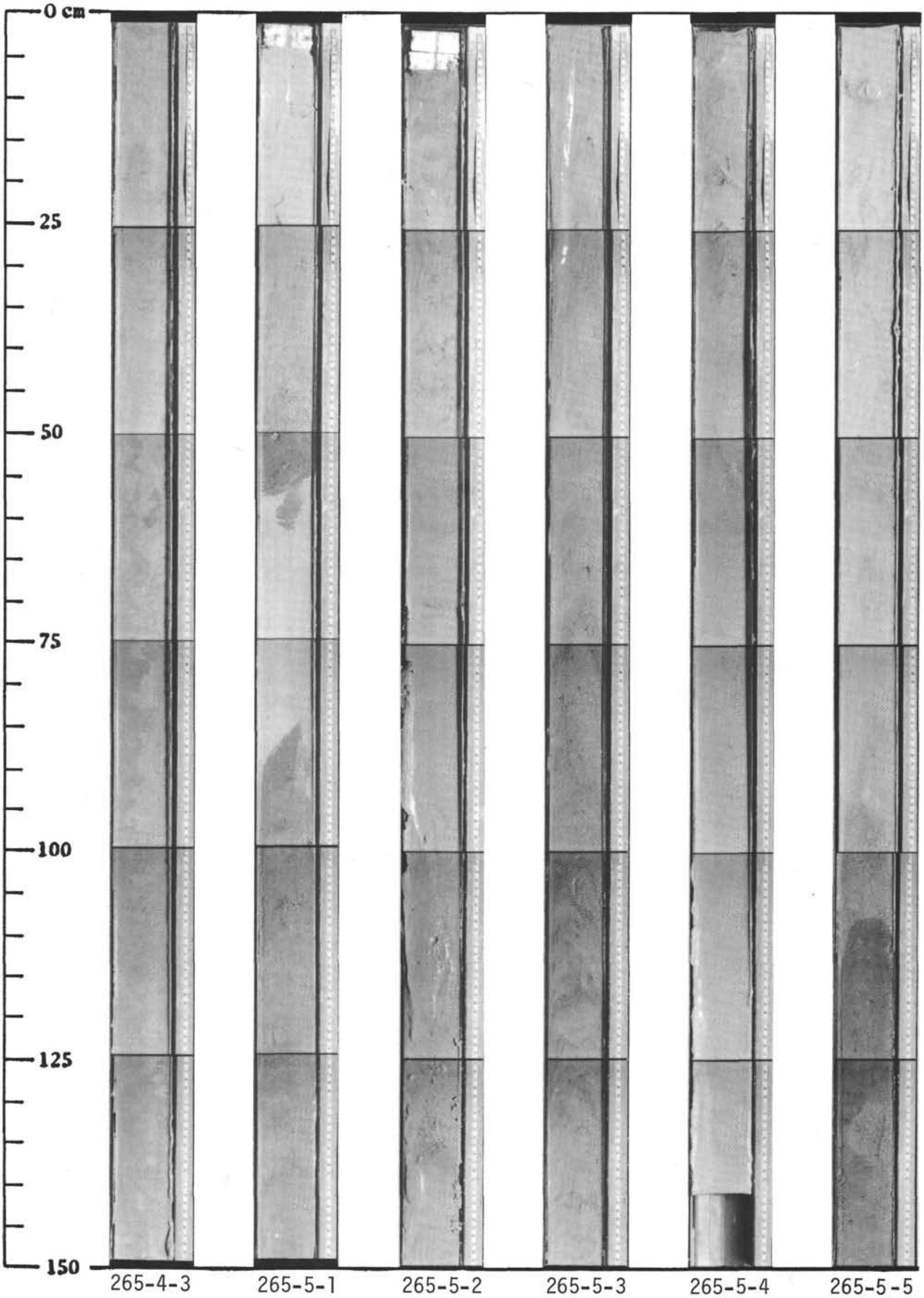
BASALT, see above.

Explanatory notes in Chapter 1

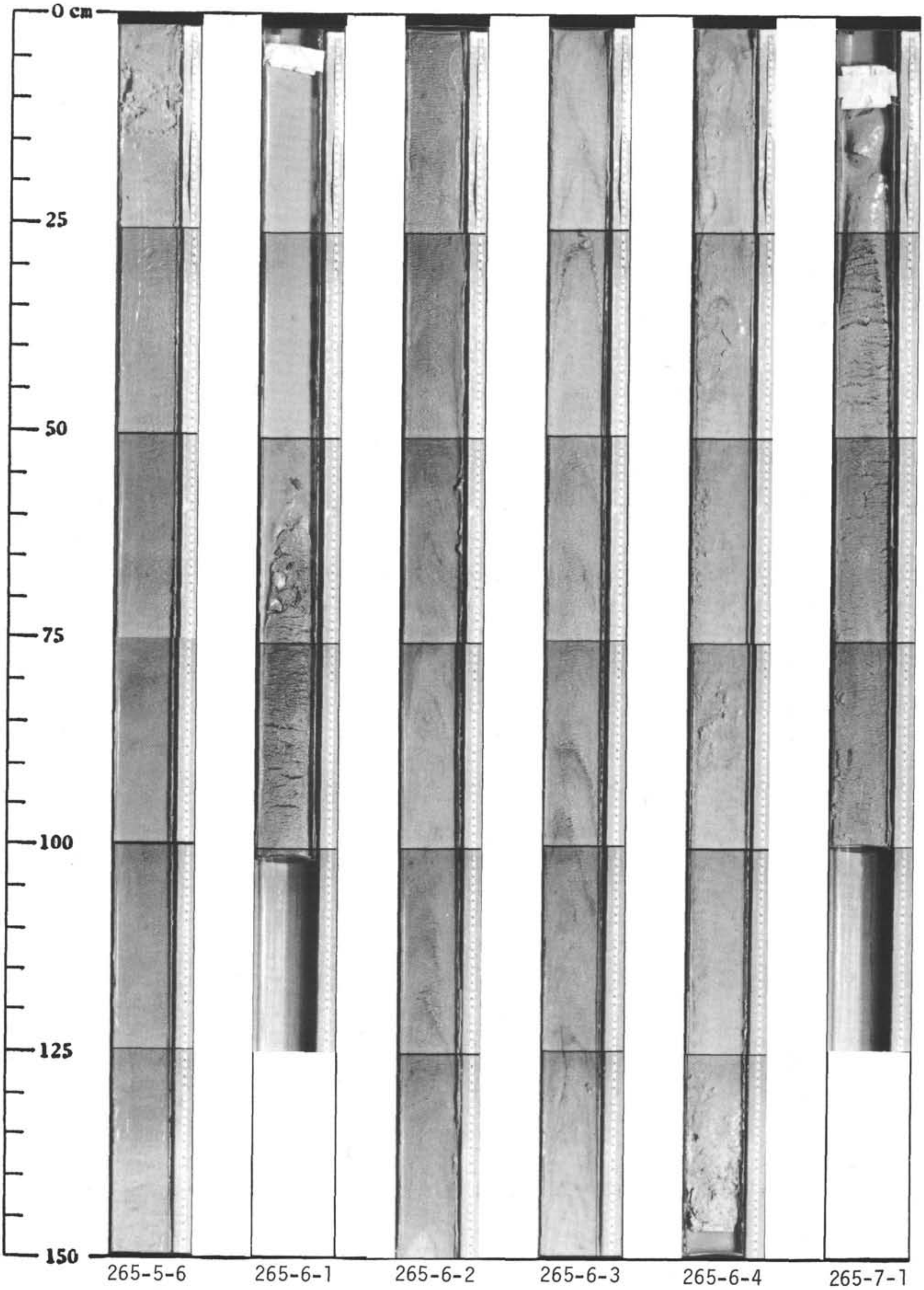

0 cm
25
50
75
100
125
150
265-1-1
265-1-2
265-1-3
265-1-4
265-1-5
265-1-6

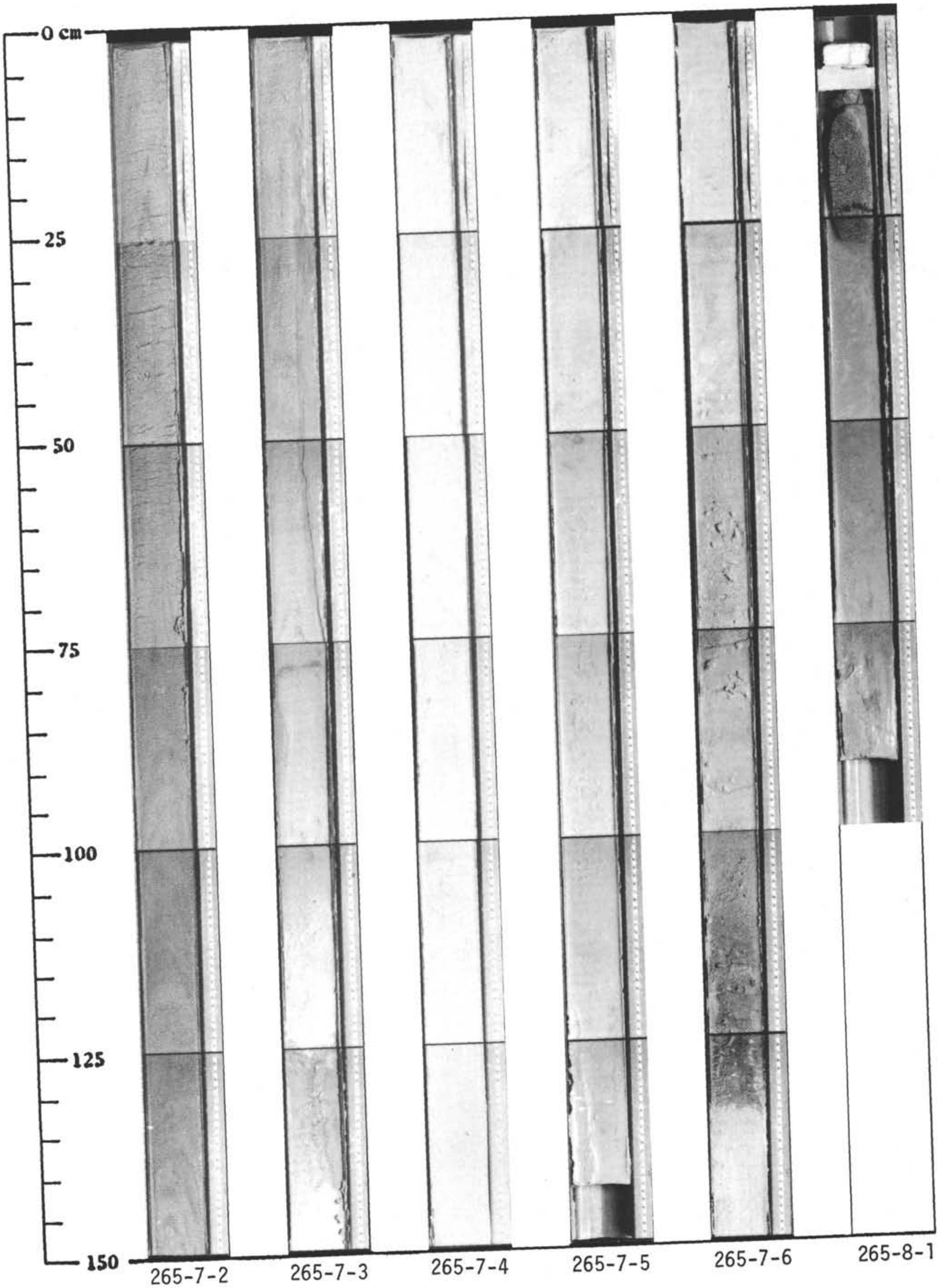

0 cm
25
50
75
100
125
150
265-2-1
265-2-2
265-2-3
265-2-4
265-2-5
265-2-6

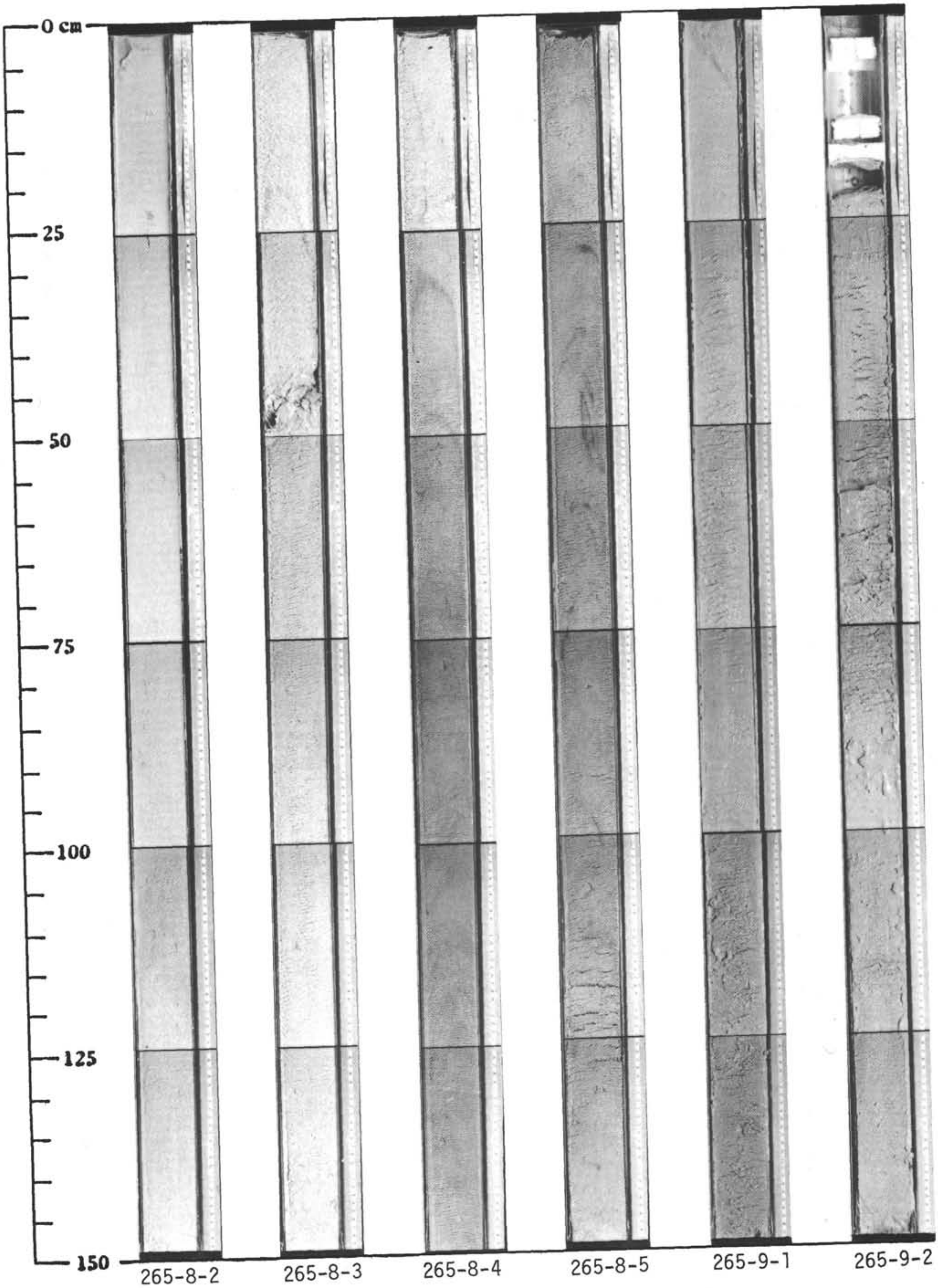

0 cm
25
50
75
100
125
150
265-3-1
265-3-2
265-3-3
265-3-4
265-4-1
265-4-2

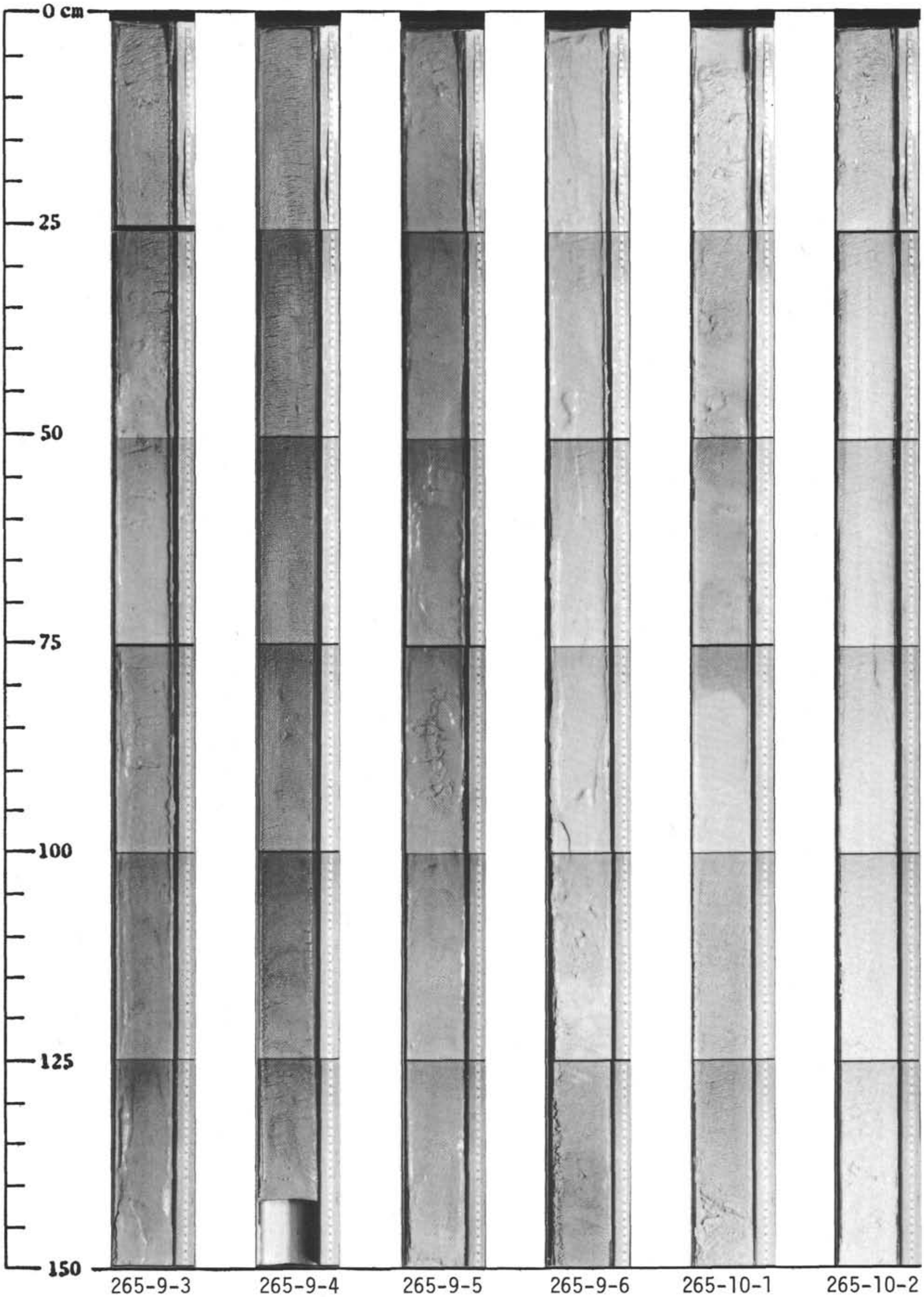


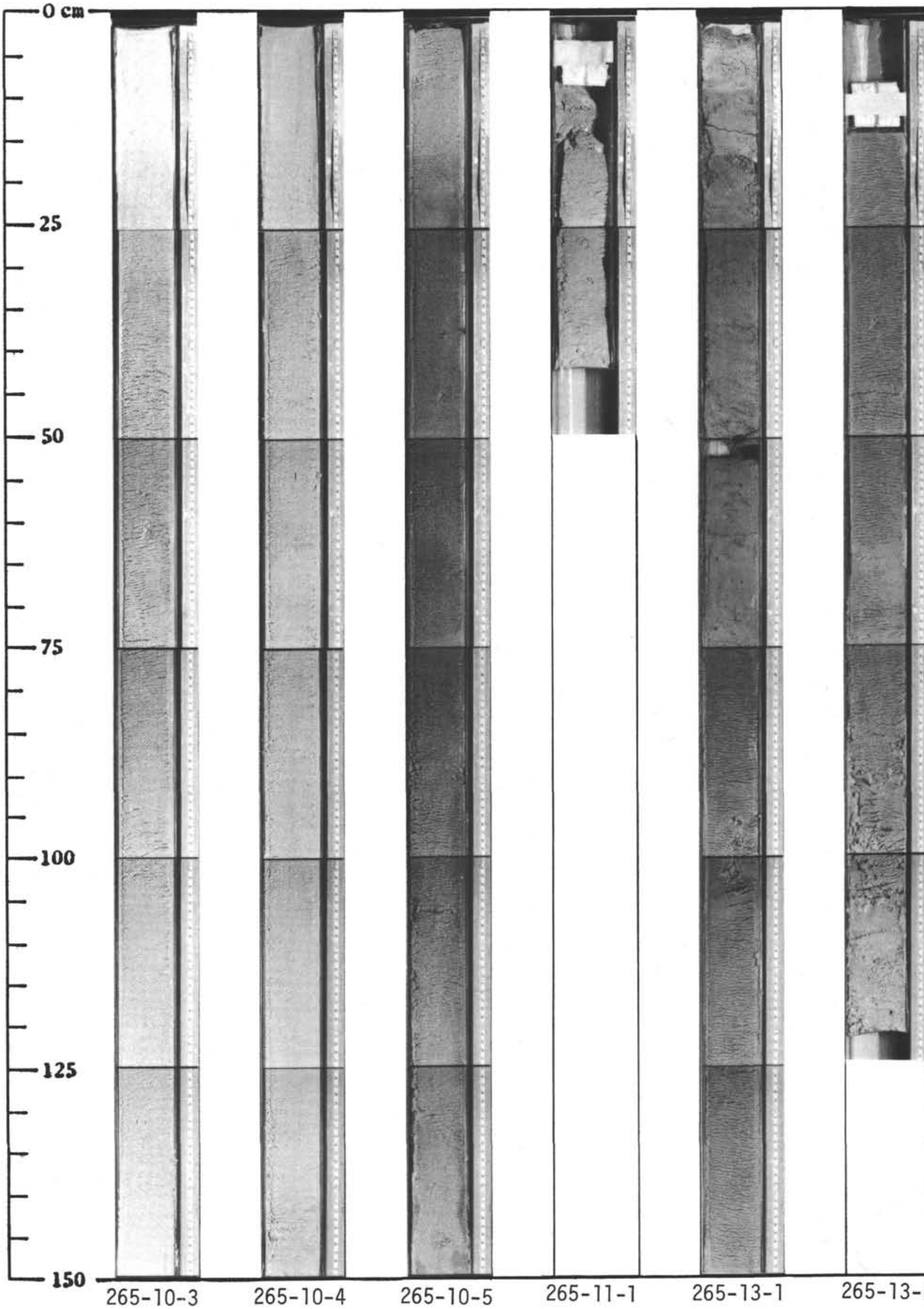
0 cm
25
50
75
100
125
150
265-4-3
265-5-1
265-5-2
265-5-3
265-5-4
265-5-5

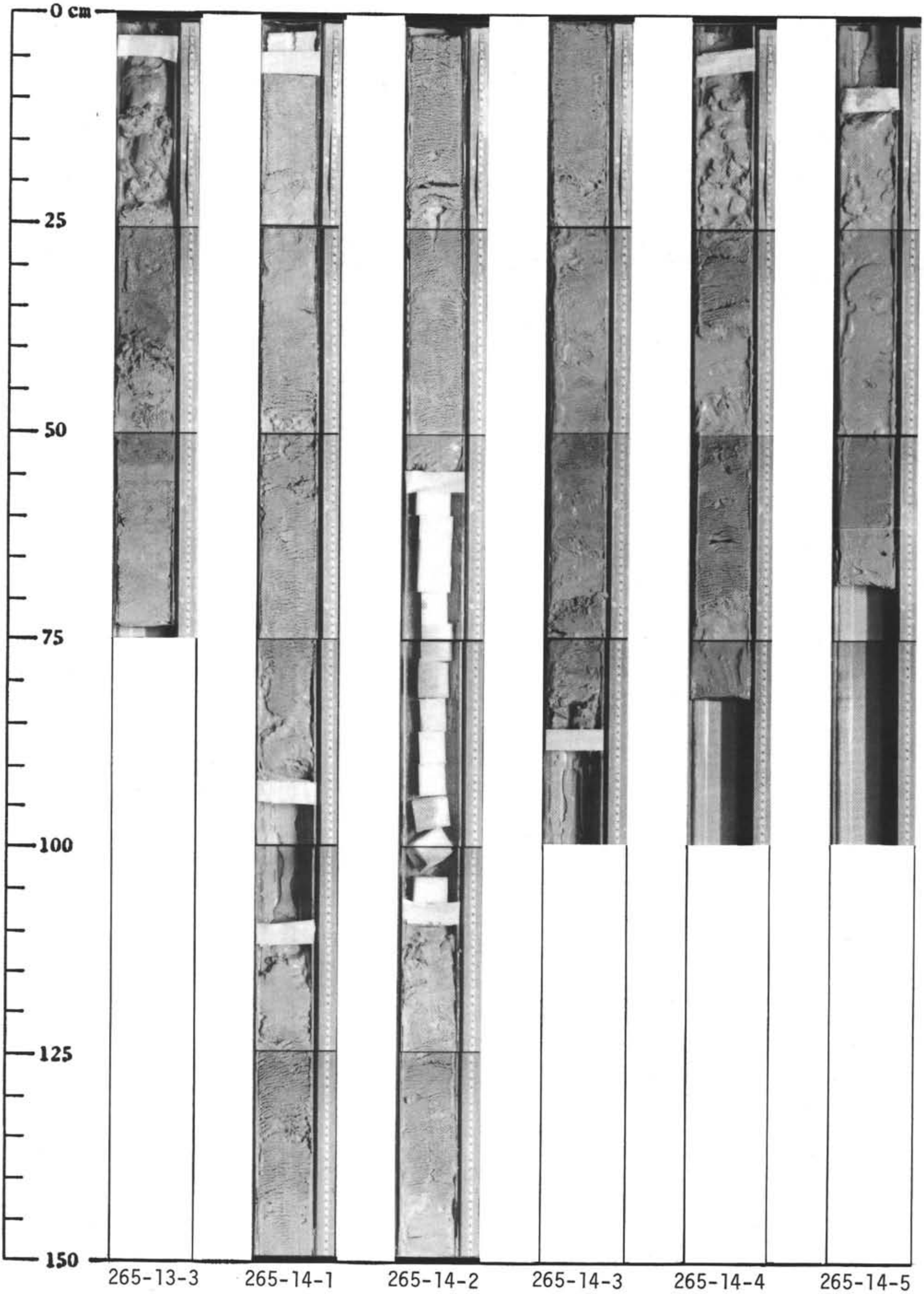

0 cm
25
50
75
100
125
150
265-5-6
265-6-1
265-6-2
265-6-3
265-6-4
265-7-1

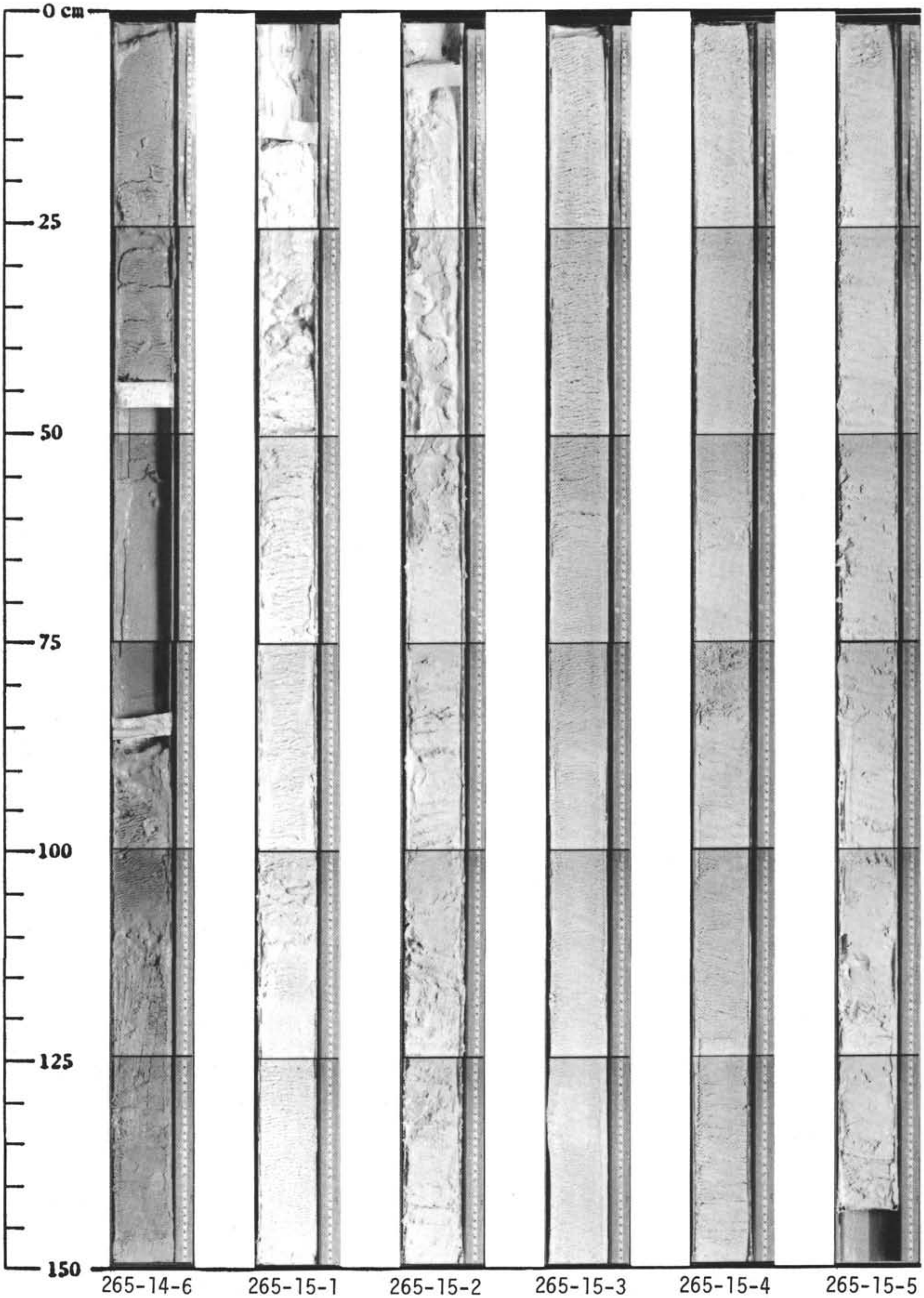

0 cm
25
50
75
100
125
150
265-7-2
265-7-3
265-7-4
265-7-5
265-7-6
265-8-1

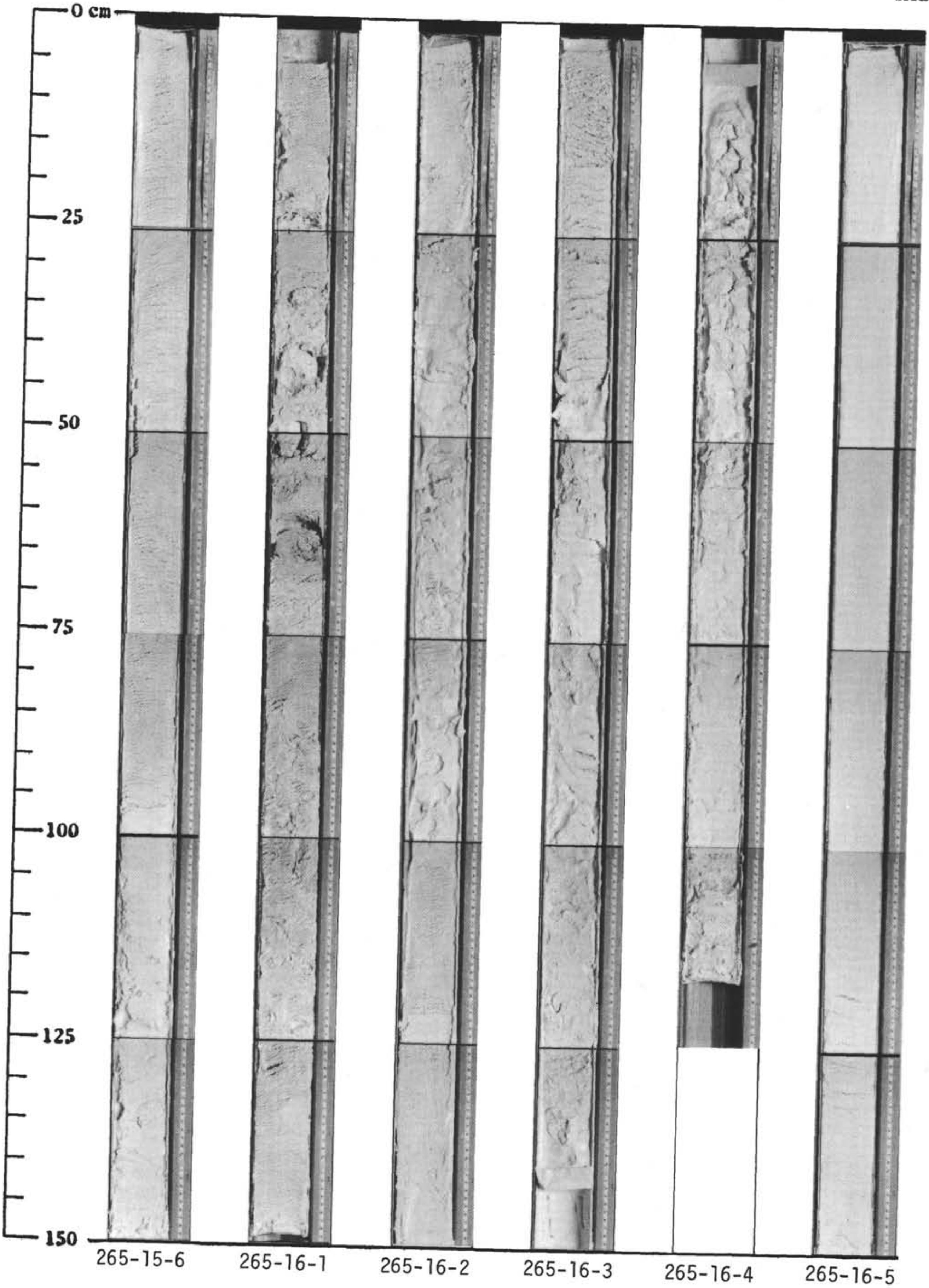

0 cm
25
50
75
100
125
150
265-8-2
265-8-3
265-8-4
265-8-5
265-9-1
265-9-2

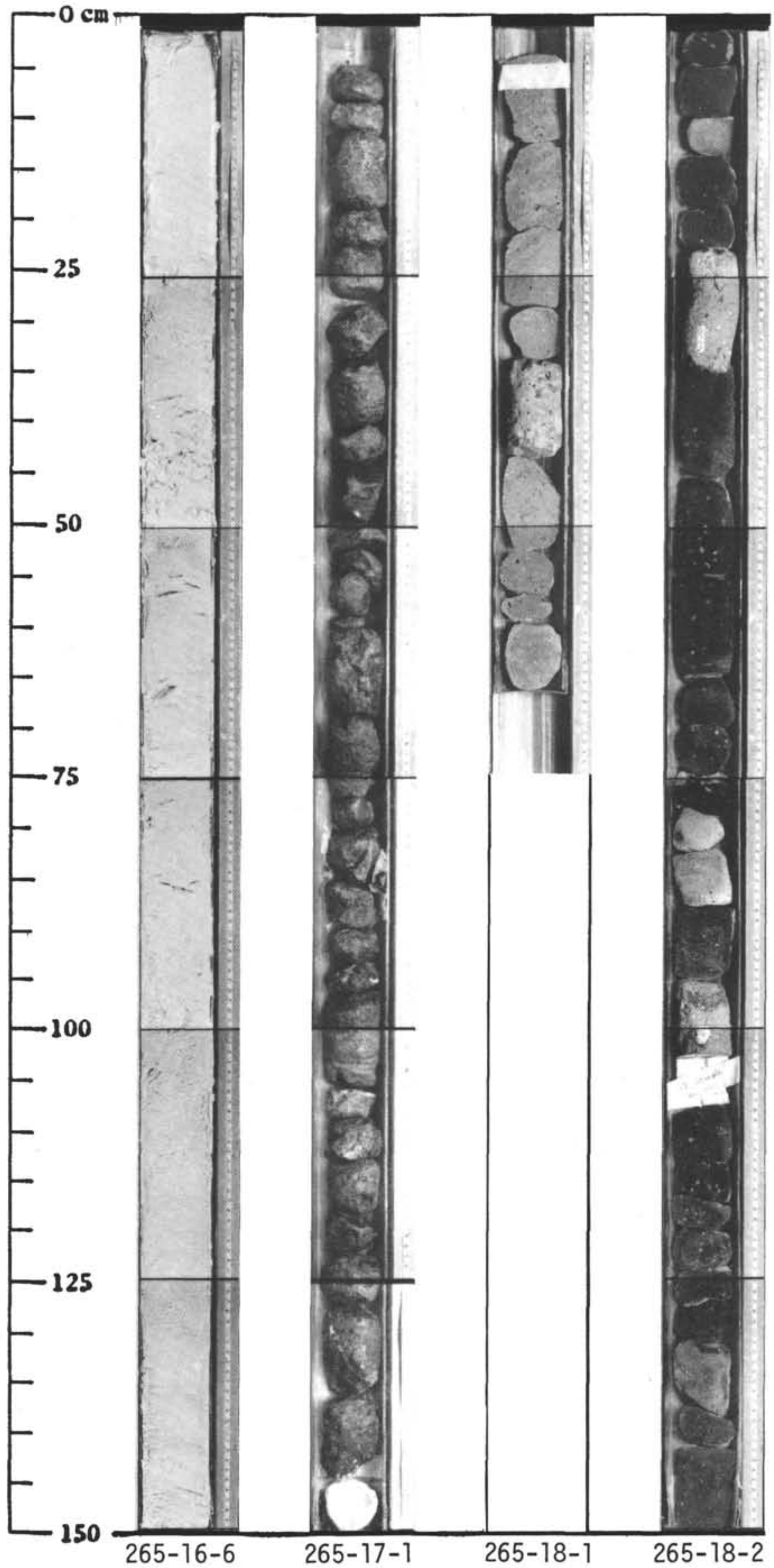

0 cm
25
50
75
100
125
150
265-9-3
265-9-4
265-9-5
265-9-6
265-10-1
265-10-2


0 cm
25
50
75
100
125
150
265-10-3
265-10-4
265-10-5
265-11-1
265-13-1
265-13-2


0 cm
25
50
75
100
125
150
265-13-3
265-14-1
265-14-2
265-14-3
265-14-4
265-14-5


0 cm
25
50
75
100
125
150
265-14-6
265-15-1
265-15-2
265-15-3
265-15-4
265-15-5


0 cm
25
50
75
100
125
150
265-15-6
265-16-1
265-16-2
265-16-3
265-16-4
265-16-5


0 cm
25
50
75
100
125
150
265-16-6
265-17-1
265-18-1
265-18-2