4. SITE 166

The Shipboard Scientific Party[1]

SITE DATA

Position:
Latitude: 3°45.7′N
Longitude: 175°04.8′W.

Geography:
In central basin, between Magellan Rise and Canton Trough, about 400 km NE of Howland Island.

Water Depth:
PDR, to derrick floor: 4950 meters
From drill pipe measurement from derrick floor: 4962 meters (adopted).

Date Occurpied: 19-22 Apr 71.

Time On Location: 86 hours, 30 minutes.

Depth of Maximum Penetration: 310 meters.

Cores Taken: 29.

Total Length of Cored Section: 237 meters.

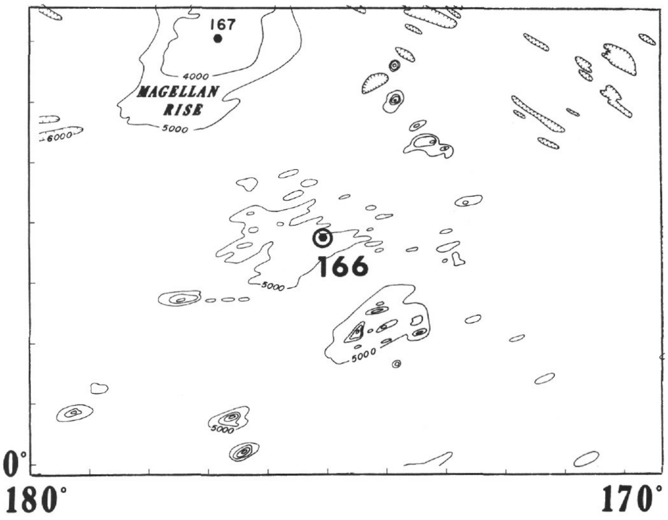
Total Recovery:
Length: 155.3 meters
Percentage: 65.3.

Percentage of Penetrated Section Cored: 65.5

Principal Results:
Site 166 is located between magnetic anomalies M-7 and M-8 of the Phoenix anomaly pattern in the central Pacific basin near the equator (Larson et al., 1972). The drill met 190 meters of radiolarian ooze, ranging in age from late Eocene to Quaternary, overlying about 20 meters of interbedded chert and brown clay containing middle Eocene fossils, and then penetrated about 90 meters of Lower Cretaceous volcanogenic, marly, and cherty sediments resting on basalt. The oldest sediments above the basalt are tentatively assigned to the Hauterivian Stage. (See Figure 1.)

BACKGROUND AND OBJECTIVES

The main objective at this site was to date the crust so the age gradient in the region west of the Line Islands could be better defined. Because of poor fossil assemblages in the deepest sediment at Site 66 (Winterer et al., 1971), the limits of possible crustal age permitted the gradient to the continuous across the Line Islands, but the presence of a group of magnetic anomalies with approximately an east-west trend in the vicinity of 0° to 4° latitude and 180° longitude (Larson et al., 1972) raised some question about a simple extension of gradient into this region.



Further objectives were to obtain an additional dating of the top of the seismic "opaque" layer and to seek evidence from sediment accumulation rate and paleomagnetic studies for latitudinal migration of this part of the Pacific plate.

OPERATIONS

The site was approached from the SSE and passed over at about 0630 hours on 19 Apr 71. The initial choice of site had been based on a N-S track of *Robert D. Conrad. Glomar Challenger's* track confirmed the presence of a large magnetic anomaly (~500γ), and the site location is slightly south of the anomaly trough. After crossing the site area on course ~240°, we returned on the reverse course to a point with a favorable section displayed on the profiler record (Figure 2) and dropped the beacon while under way (Figure 3).

The first attempt to core was made in the interval 4945 to 4954 meters and recovered no sediment. The second attempt at 4954 to 4963 also recovered mostly water, but a few forams and rads were caught in the cloth sock. This sample was called Core 1 and official water depth adopted was 4962 meters.

On both these attempts, the bit was raised about 25 meters above bottom while the core barrel was being pumped down, in case our consistent finding of bottom with the drill string 15 to 30 meters below PDR depth had been due to jetting out the upper sediment with the pump. The test was not conclusive, but at least the disagreement was only 12 meters at this hole.

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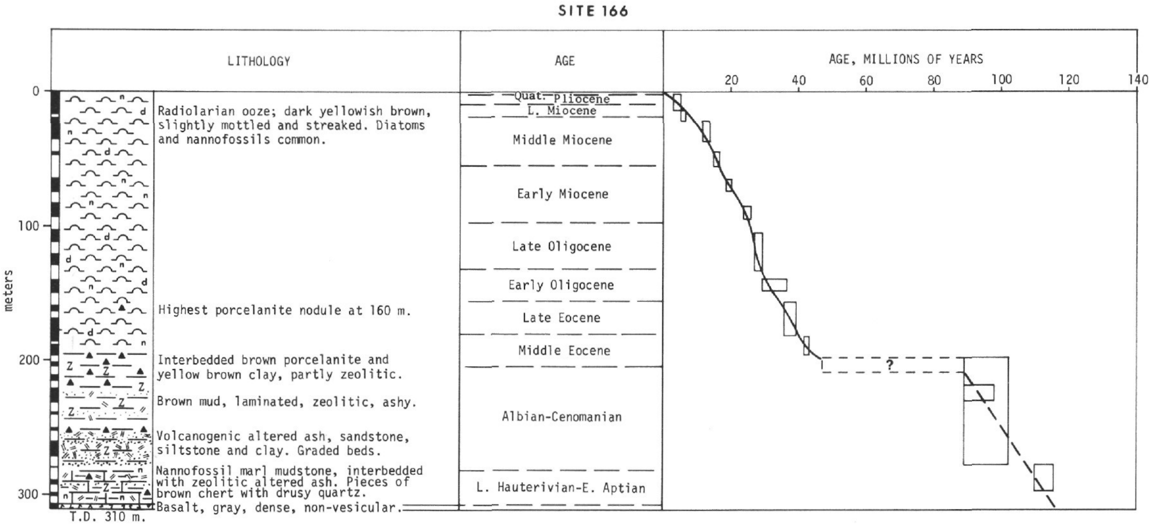

Figure 1. *Graphic log showing lithology, age, and rate of accumulation of sediments at Site 166.*

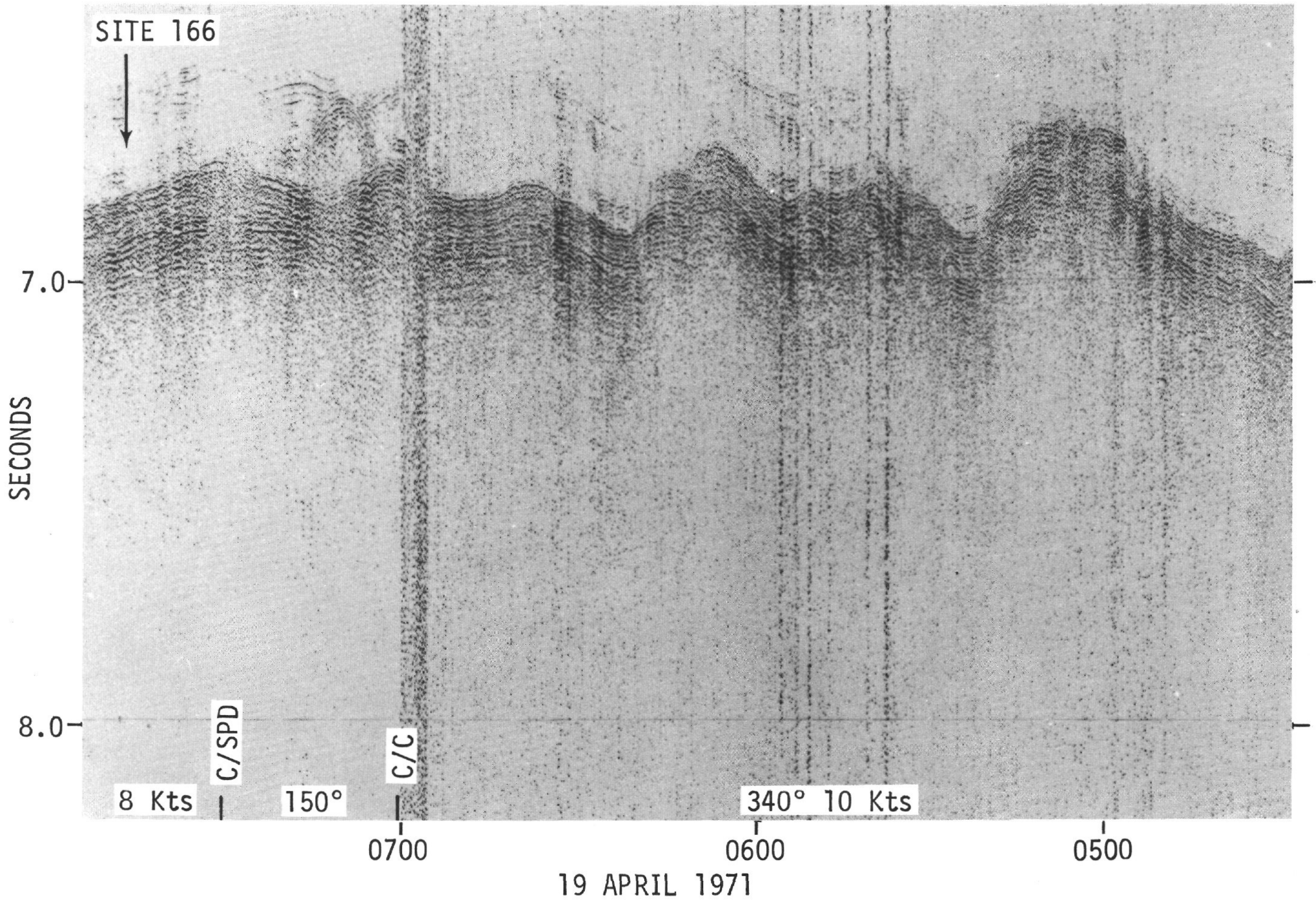

Figure 2. *Seismic profile recorded by* Glomar Challenger *while approaching Site 166.*

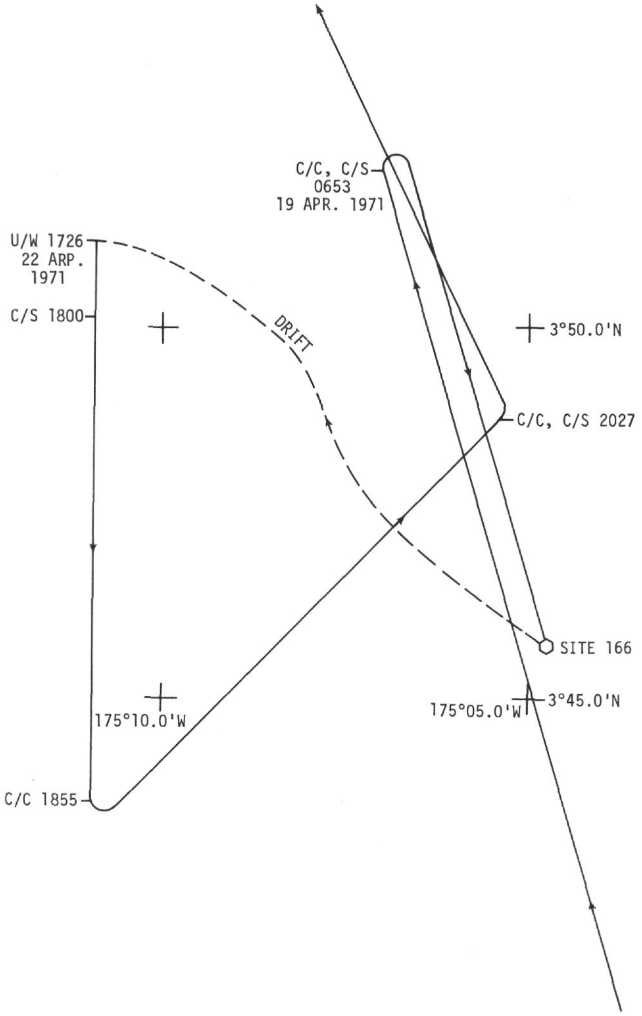

Figure 3. *Track of* Glomar Challenger *in the vicinity of Site 166.*

The seismic section (Figure 2) consists of an upper transparent layer 0.255 sec thick with a moderately reflective zone at about 0.195 sec below sea floor. The opaque layer beneath is 0.115 sec thick. In the absence of a lower transparent layer, the basement reflector is not prominent, but is reasonably distinct.

The section was spot cored to a depth just above the opaque layer and was cored continuously from that point to basement. Penetration was fast and easy in the upper transparent layer with generally good receovery. The opaque layer was cherty in the upper part and difficult to core. The lower part contained volcanic claystones, sandstone, and an even harder chert. The bottom-most sediment, fortunately, was a dark brown clay, rich in nannofossils, and recovery was good, providing fossils for age determination.

Basalt was encountered at 307 meters below bottom. It was drilled for 1.5 hours, and a 3.5-meter core was recovered. The penetration was appreciably slower than had been achieved at Site 164 and 165 and may have been due in part to plugged water ports in the bit.

BIOSTRATIGRAPHIC SUMMARY

The first 38 meters of the section were cored continuously. These five cores contained Quaternary, Pliocene, and late to middle Miocene radiolarian ooze. Thereafter the section was spot cored, with samples recovered from the lower Miocene, upper and lower Oligocene, and upper Eocene parts of the section. Below the upper Eocene level, the section was cored continuously to basement; however, recovery was poor.

The Cenozoic part of the section is predominantly a radiolarian ooze with moderately well-preserved calcareous nannofossils occurring only in the top 10 cm of Core 1. Poorly preserved nannofossils are found in Cores 4 through 12. Foraminifera are found only in a thin Quaternary layer at the top of the section and as a few specimens in the Miocene (Core 6, CC). Radiolaria are abundant and moderately well-preserved throughout the section down to the lower part of the middle Eocene (Core 17). Stratigraphic breaks occur between the Quarternary and lower part of the Pliocene and within the upper Miocene.

Core 18 contains no identifiable nannofossils, and Core 19 contains only a few, very poorly preserved Radiolaria that are probably Cretaceous in age. Radiolaria are absent in Core 20 except for a few down-mixed specimens; however, several broken specimens of foraminifera suggest a Cenomanian or Albian age for this core. Thus, any lower Eocene and Paleocene that exists would be contained in the interval sampled by Core 18. Core 19 may represent the only Upper Cretaceous recovered at this site. Only radiolarians are found in Cores 21 to 25. The calcareous microfossils of Cores 26 to 28 indicate the basement age is late Hauterivian to early Aptian. However, the radiolarian assemblage in Cores 23 to 28 is comparable to that identified as late Albian to Cenomanian in age at other sites of this leg. This discrepancy in age might be accounted for by the down-mixing of a younger radiolarian fauna into the older calcareous sediments of Cores 26 to 28 during the drilling process. The fact that Core 22 contains a very well preserved radiolarian assemblage that is almost totally different from the underlying cores does not support his argument. There remains the explanation that the calcareous microfossils of Cores 26 to 28 are reworked during deposition from a nearby outcrop of older sediments. But if the radiolarians give the true basement age as no older than Late Albian, whence came the Hauterivian calcareous nannoplankton? The basalt "basement" sampled at this site might represent a widespread extrusion or flood of basalt which considerably postdates crustal formation. If this is true, the Late Albian age given by the radiolarians would be a minimum date for this event. The reworked Hauterivian nannofossils could have been preserved from the basalt flood on an isolated topographic high (such as the Magellan Rise). Thus, they provide an estimate of the minimum age of the actual crust.

The Tertiary radiolarian ooze has an average accumulation rate of 5 m/m.y. Because of the discrepancy in ages, no accumulation rate was established for the Cretaceous part of the section.

LITHOLOGIC SUMMARY

For convenience in describing the types of sediments and rocks cored at Site 166, the stratigraphic section may be divided into six units as follows:

1) radiolarian ooze (0-195 m);

2) interbedded porcellanite and brown clay (195-221 m);

3) brown mud (221-250 m);

4) altered ash (250-279 m);

5) nannofossil marl mudstone and porcellanite breccia (279-307 m);

6) basalt (307-310 m).

The top 195 meters at this site are radiolarian ooze and correspond to the Upper Transparent Layer recorded on continuous seismic reflection profiles in the central Pacific basin. For the most part, the siliceous ooze is dark yellowish brown, with lighter mottles and streaks. Diatoms are present in most of the section, though less common and locally missing below 120 meters. Nannofossils are common in most intervals and locally are so abundant that the sediment is a radiolarian nannofossil ooze. The lighter yellowish brown intervals and mottles have the higher calcareous contents. The sediment is almost wholly biogenous in origin. It usually contains a percent or so of yellow brown glass and of micronodules, whereas zeolite and feldspar and even rarer.

The uppermost 14 cm cored in Section 1 of Hole 166A confirmed what was suspected from the few grains adhering to the cloth placed in the core catcher of the top core of Hole 166, namely that the sea floor at this site is Quaternary sediment of partly dissolved foraminifers, delicate radiolarian spines, and has a greater percentage of nannofossils than the underlying lower Pliocene radiolarian ooze. The difference may reflect some late Cenozoic change in the lysocline, or possibly solution may continue in the upper part of the sediment column, in addition to solution of particles falling through the overlying water.

The Upper Transparent Layer commonly has a few faint and discontinuous reflecting horizons within it. A nodule of greenish gray porcellanitic chert, rather soft and only 3 cm in diameter, was cored at 160.2 meters. Some core barrels contained watery mud. The lumps of mud (caught in a collander) commonly were firmer than typical radiolarian ooze, suggesting that parts of the apparently homogeneous ooze do differ slightly in induration. Some of the less deformed parts of Core 10 (121-130 m) indicate that calcareous-rich and calcareous-poor beds alternate in that part of the section. Perhaps incipient chertification, subtle differences in induration, or compositional layering as evidenced above may provide sufficient differences in acoustic impedance to make them the faint seismic reflectors.

The top of the chert cored at 195.2 meters must represent the top of the Opaque Layer at this site. The chert is a moderate brown, dull-lustered, clay-rich, brittle porcellanite that is interbedded with a moderately zeolitic, brown clay of pelagic origin. The base of this unit is at least as deep as 214 meters, the lowest recovery in Core 19, and probably extends to 221 meters, the top of Core 20. The base, however, may be gradational, because the clay at the base of Core 19 was already quite zeolitic, and much of the evidence is missing; recovery of the unit was poor both in its slight quantity and in the disturbance of the fractured, hard porcellanite churned into the soft clay.

The unit between 221 and 150 meters is a pelagic brown mud, apparently without chert layers. The poor recovery in Cores 21 and 22 and the few centimeters of chert fragments at to top of Core 23 (250 m) that probably represent cavings force us to retain the possibility that some thin chert stringers may be in the unit. If so, this unit might be combined with the overlying chert and clay unit. The pelagic mud here is an ashy, zeolitic siltstone colored various shades of brown by its varying manganese content. Where not badly deformed it shows lamination clearly, as well as broader layering 1 to 12 cm in thickness that may be original bedding or merely the result of later Mn banding.

Between 250 and either 271 or 279 meters the rock is of volcanic origin. It most likely is altered ash, because so much of the glass is light colored and so may not have come from mid-oceanic basaltic volcanism. However, it may be altered hyaloclastite moved a shorter distance by slumping and currents to this site, or some combination of pyroclastic and reworked hyaloclastic glass. Now it is bluish gray volcanic sandstone, siltstone, and clay in graded beds that commonly are mottled. Montmorillonite and analcime are especially abundant, and some parts are rich in chlorite (clinochlore and possible antigorite) and zeolites, all of which are alteration products of the ash. Between 279 and 305 meters, coring recovered two lithologic types that apparently are interbedded. One is nannofossil marl mudstone, a calcareous, stiff, zeolitic mudstone stained dusky brown from Fe-Mn oxides. It has within it beds of zeolitic altered ash resembling parts of the overlying ashy unit. The other principal rock type is a breccia of lighter brown porcellanite that has been cemented by veinlets of limpid, drusy quartz. This chert apparently is the seismic reflector above the basement reflector at Site 166. The brown chert has a dull matte luster but is less crumbly and brittle than the higher ones. It was recovered as fragments studded within the stiff marly mudstone, and so the overall structural relationships of the chert in place aannot be known. It seems likely, however, that the fracturing of the porcellanite was not cataclastic, but rather it was probably formed during the development of secondary chemical structures, such as septarian nodules. As evidence, many of the quartz veins are wedge shaped, not passing completely through a piece of the rock, and the crustified quartz on opposite faces of chert commonly terminates into a central void in vein-like fashion.

Core 29 recovered basalt between 307 meters and the total depth of 310.5 meters. The rock is gray, with local shades of green and brown, and is heavily veined with white calcite. The veins, about 1 cm thick, mainly have thin centers of green celadonite. No vesicles were seen, but there are a few calcite amygdules to 1.5 cm in diameter that may have formed from ingested sediment rather than from escape of magmatic volatiles. Black selvages of brittle glass, partly altered to green montmorillonite, are evidence that the basalt was extrusive rather than emplaced as a sill. The glass may in fact mark pillow edges and successive thin flows broken into hyaloclastite. Some red brown inclusions adjacent to glass and to the more abundant calcite veins may represent included sediment. By trace-element criteria, this now-altered basalt resembles those from spreading ridges.

PHYSICAL PROPERTIES

Site 166 has only a few undisturbed sections, but the densities of these sections are not significantly higher than the densities of disturbed sections. Consequently, at least for the radiolarian oozes, the densities are probably fairly representative of in situ conditions. The top 190 meters has the characteristic radiolarian ooze low density of 1.1 to 1.2 and low gamma count of about 100. The usual Quaternary gamma high is missing or subdued. Below Core 19 the syringe grain densities are exceptionally high. Section weight densities for the basalt cores are too low because the diameter of the basalt samples was considerably smaller than that of the core liner, leaving large air spaces.

The clays, muds, mudstones, and ashes below 190 meters have high but erratic gamma counts due to the low amount of diluting biogenous material and the presence of zeolite and ashes. The highest average gamma count for a core is 1725 for Core 20. The reason for this very high value is unclear; montmorillonite and K-feldspar are abundant in this core but are present in lower amounts than in Core 23, which has a gamma average of only 525.

CORRELATION BETWEEN STRATIGRAPHIC SECTION AND SEISMIC REFLECTION PROFILE

The correlation diagram shown in Figure 4 is relatively uncomplicated. Only two distinct subbottom interfaces are recorded by the profiler and these can be correlated with the top of the opaque layer and with the basaltic basement. Two alternatives are possible – the one illustrated, in which the top of the opaque layer correlates with the first occurrence of chert at 190 meters, and one in which it correlates with a harder level at 200 meters. The second interpretation gives velocities of 1.57 km/sec for the transparent layer and 1.86 km/sec for the opaque layer. The drilling rate graph shows the first major break at 190 meters, and, unquestionably, this represents a significant lithologic change between the clays and the chert. However, the first 10 meters of chert was cut with a relatively small amount of weight (<5000 lbs) on the bit, while the interval below 200 meters was cut with 15,000 to 20,000 lbs weight. Among other things, the comparison of these two possible correlations shows the effect on calculated sound velocity when the thickness of a layer is uncertain or when correlation between reflector and lithologic change is uncertain. A 10-meter uncertainty in the water depth by drill string measurement would have a similar effect, and, if the upper layer is thin, the calculated velocity could be ridiculous – hence, our concern about the discrepancy between PDR and drill string depth.

A reflector 0.06 sec above the opaque layer was not identified by a lithologic change or associated with a drilling break.

A rather strong drilling break occurred at Core 25 (270 m) where hard layers of volcanic claystone and sandstone were recovered, but no corresponding reflector is observed in the underway seismic record. There is some indication of one at the approximate time in a record made while drilling, but this kind of evidence must be treated with

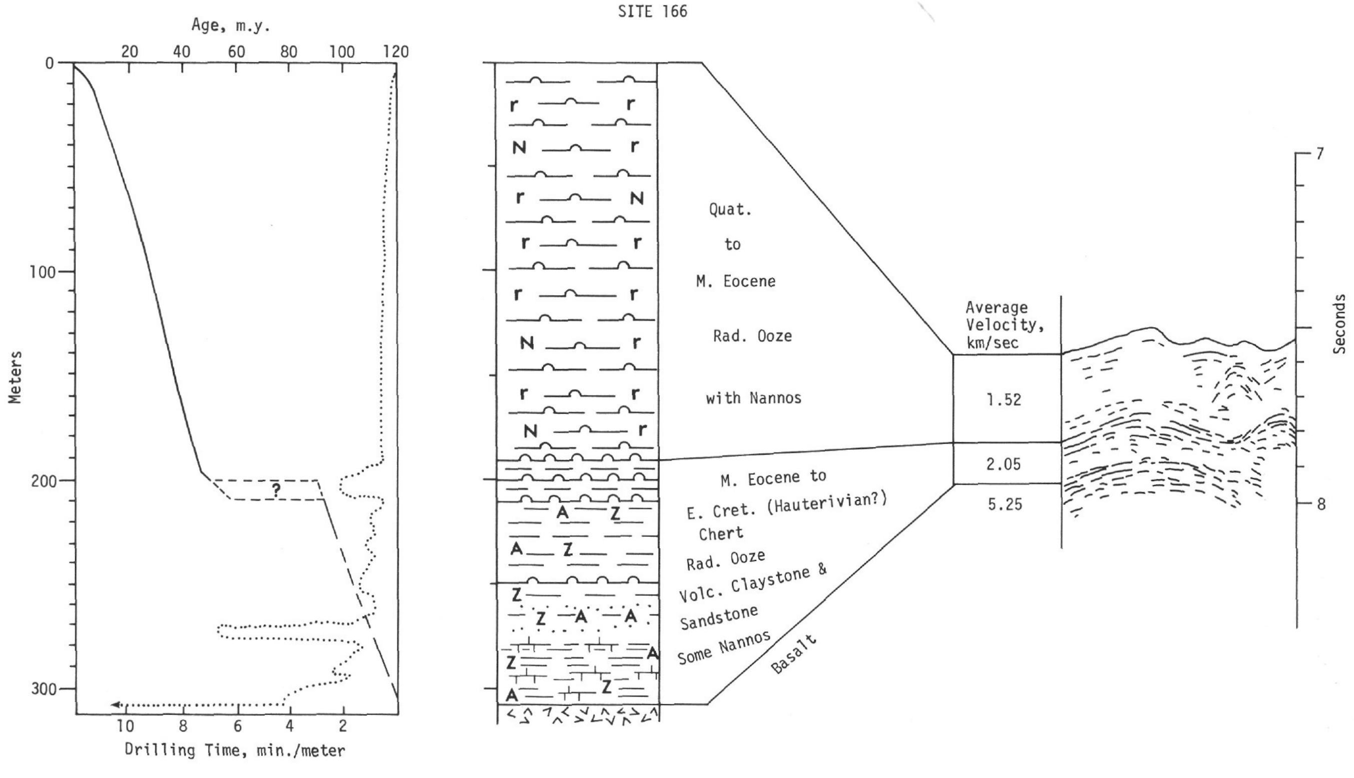

Figure 4. *Correlation of lithology, seismic stratigraphy, drilling rates, and sediment accumulation rates at Site 166.*

caution, as side echoes may appear much like bona fide echoes from subbottom interfaces in records made while the ship is stopped.

From a geophysical point of view, the principal results from this site are:

1) A good determination was obtained of the age of the cherts that appear in the basal part of the transparent layer, indicating that they are not seriously time-transgressive between this site and Site 165. Therefore, whether the prominent reflector A′ recognized in seismic profiler records in this region corresponds to the Eocene cherts or to the hiatus just beneath them, it can be considered an important horizon for geological mapping.

2) A reasonably good determination was obtained of interval velocity in the upper transparent layer, which indicates that the average speed of sound in about 200 meters of clay and radiolarian ooze is little different from the speed in water.

3) The average speed of sound in the layer between reflector A′ and basement is 1.9 to 2.0 km/sec.

4) A determination was obtained of crustal age (115-120 m.y.), which must be considered in any interpretation of the E-W magnetic anomaly pattern in this region.

CONCLUSIONS

The stratigraphic section at Site 166, judging from the reflection profiles available to us, is rather typical of the region and comprises four units:

1) An upper acoustically transparent layer consisting chiefly of brown radiolarian ooze of middle Eocene to Quaternary age. At Site 166 this unit is 195 meters thick.

2) An acoustically more or less opaque layer, consisting of interbedded brown porcellanite chert and yellow brown clay, about 25 meters thick. The unit is of middle Eocene age at the top and probably of Cretaceous age at its base.

3) An acoustically more transparent layer, consisting of brown zeolitic mud, altered volcanic ash, and near the base, nannofossil marl mudstone and brown chert. This unit is about 85 meters thick and ranges in age from late Hauterivian or early Aptian to at least Albian, and rests on basalt.

4) Extrusive basalt.

Rates of Accumulation

Rates of accumulation (uncorrelated for compaction effects) show a familiar pattern (Figure 1):

1) A very late Tertiary and Quaternary time of slow accumulation (~2 m/m.y.)

2) A somewhat faster rate from middle Eocene through middle Miocene time (~5 m/m.y.)

3) A pronounced break between Middle Eocene and Cretaceous times. At Site 166, no datable fossils were recovered in the 20 meters that separate Middle Eocene from Albian fossils. The average rate for this interval, using these end points, is only about 0.4 m/m.y. It is not possible on the basis of the evidence at hand to say whether any beds have actually been removed by post-Albian, pre-Middle Eocene erosion.

4) A time of faster accumulation (5m/m.y.) during the Early Cretaceous. The Cretaceous sediments are notably ashy, and the accumulation rate doubtless reflects the effects of regional vulcanism as well as that of biogenous pelagic sedimentation. The marly sediments near the base of the column may be associated with relatively shallow depths—above the compensation depth—when Site 166 was still near the rise crest.

Any interpretations of the significance of the time of very slow accumulation between the Cretaceous and Tertiary are still only speculation. The same break in the accumulation curve is seen at Sites 164 and 165, as well as at many other drilling sites in both the Pacific and Atlantic. It is doubtless closely related to the problem of the almost universal occurrence of cherts in the Middle Eocene. The effect appears to be independent of depth and latitude (or paleolatitude), and suggests that fundamental oceanographic conditions, e.g., the intensity of circulation and vertical mixing, were different. These conditions, in turn, must be a product of the gross patterns of distribution of land and sea. A more extended treatment of this problem is given in the chapter on Regional Problems.

The middle Eocene-Miocene radiolarian ooze includes small proportions of solution-resistant species of calcareous nannofossils, and in one core (Core 6) in the lower part of the middle Miocene, nannofossils are not only abundant, but are accompanied by a few planktonic foraminifera. Otherwise, the site has remained mainly below the lysocline for planktonic foraminifera, but above the compensation depth for calcium carbonate, since at least middle Eocene times. Aside from this one episode, the radiolarian ooze unit provides no clue as to the time of passage of the site beneath the equator. If the middle Miocene event is indeed that crossing, and records depression of the compensation depth beneath the higher fertility region beneath the equator, the latitude change since the equatorial crossing has been about 4 degrees in the last 16 m.y., or 2.5 cm/yr.

Age of Basement

Late Hauterivian or early Aptian nannofossils and foraminifera occur together in the last two cores just above the basalt, and, since the basalt appears to be extrusive, this puts a limit on the age of basement here.

The discrepancy between the ages obtained by Radiolaria (late Albian to Cenomanian) and by nannofossils and foraminifera (late Hauterivian to early Aptian) may be due to reworking of older calcareous fossils into younger sediments, or it may be due to our imperfect knowledge of the biostratigraphy of the several groups of microfossils. Foraminifera and nannofossils are of such grossly different sizes (and settling velocities) that their joint occurrence as detrital fossils would be somewhat surprising. If the calcareous fossils are of the age assigned to them, then original oceanic crust in the general vicinity of the site must be at least as old as those fossils. The east-trending magnetic anomaly pattern on which Site 166 was drilled (Larson et al., 1972) was presumably created by spreading at a rise crest at which oceanic crust was being generated in Hauterivian or Aptian times.

REFERENCES

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Winterer, E. L., Riedel, W. R., Moberly, R. M., Jr., Resig, J. M., Kroenke, L. W., Gealy, E. L., Heath, G. R., Bronnimann, P., Martine, E. and Worsley, T. R., 1971, Site 66, *In* Winterer, E. L., Riedel, W. R. et al., 1971. Initial Reports of the Deep Sea Drilling Project, Volume VII. Washington (U. S. Government Printing Office). **725**.

APPENDIX A
Core Inventory – Site 166

Core	Depth Below Sea Floor (m)		Total Depth[a] (m)		Cored (m)	Recovered (m)	Lithology	Age
	Top	Bottom	Top	Bottom				
1	0	1	4962	4963	1	CC	Radiolarian foraminiferal ooze	Quaternary
2	1	11	4963	4973	10	9	Radiolarian ooze	Pliocene
3	11	20	4973	4982	9	6	Radiolarian ooze	Late Miocene
4	20	29	4982	4991	9	9	Nannofossil-radiolarian ooze	Middle Miocene
5	29	38	4991	5000	9	7	Nannofossil-radiolarian ooze	Middle Miocene
	38	47	5000	5009	Wash			
6	47	56	5009	5018	9	CC	Nannofossil-bearing radiolarian ooze	Middle Miocene
	56	65	5018	5027	Wash			
7	65	74	5027	5036	9	9	Nannofossil-radiolarian ooze	Early Miocene
	74	84	5036	5046	Wash			
8	84	93	5046	5055	9	9	Nannofossil-bearing radiolarian ooze	Early Miocene
	93	103	5055	5065	Wash			
9	103	112	5065	5074	9	8.5	Nannofossil-bearing radiolarian ooze	Late Oligocene
	112	121	5074	5083	Wash			
10	121	130	5083	5092	9	7	Nannofossil-bearing radiolarian ooze	Late Oligocene
	130	140	5092	5102	Wash			
11	140	149	5102	5111	9	9	Nannofossil–and diatom-bearing radiolarian ooze	Early Oligocene
	149	159	5111	5121	Wash			
12	159	163	5121	5125	4	9	Nannofossil- and diatom-bearing radiolarian ooze	Late Eocene
	163	169	5125	5131	Wash			
13	169	178	5131	5140	9	9	Diatom-bearing radiolarian ooze	Late Eocene
14	178	187	5140	5149	9	9	Radiolarian ooze	Middle Eocene
15	187	189	5149	5151	2	0.1	Diatomaceous radiolarian ooze	Middle Eocene
16	189	198	5151	5160	9	8.5	Radiolarian ooze; minor chert and brown clay	Middle Eocene
17	198	202	5160	5164	4	CC	Radiolarian ooze; minor chert and brown clay	Middle Eocene
18	202	211	5164	5173	9	2.5	Chert and brown clay	Late Albian to Cenomanian
19	211	221	5173	5183	10	3.5	Chert and brown clay	Late Albian to Cenomanian
20	221	230	5183	5192	9	9	Brown clay	Late Albian to Cenomanian
21	230	240	5192	5202	10	0.5	Brown clay	Late Albian to Cenomanian
22	240	250	5202	5212	10	0.1	Brown clay and chert	Late Albian to Cenomanian
23	250	260	5212	5222	10	2	Zeolitic mudstone and sandstone with chert	Late Albian to Cenomanian
24	260	270	5222	5232	10	9	Zeolitic mudstone and sandstone	Late Albian to Cenomanian
25	270	279	5232	5241	9	1.5	Zeolitic mudstone and sandstone	Late Albian to Cenomanian
26	279	289	5241	5251	10	0.1	Nannofossil-rich mudstone	Late Hauterivian-Cenomanian
27	289	298	5251	5260	9	3	Nannofossil-rich zeolitic mudstone	Late Hauterivian-Cenomanian
28	298	307	5260	5269	9	2	Nannofossil-rich zeolitic mudstone, with chert	Late Hauterivian-Cenomanian
29	307	310	5269	5272	3.5	3.5	Basalt	
1A	0	9	4962	4971	9	6	Diatomaceous radiolarian ooze	Quaternary to Late Miocene

[a] Measured from the derrick floor.

APPENDIX B
Physical Properties – Site 166

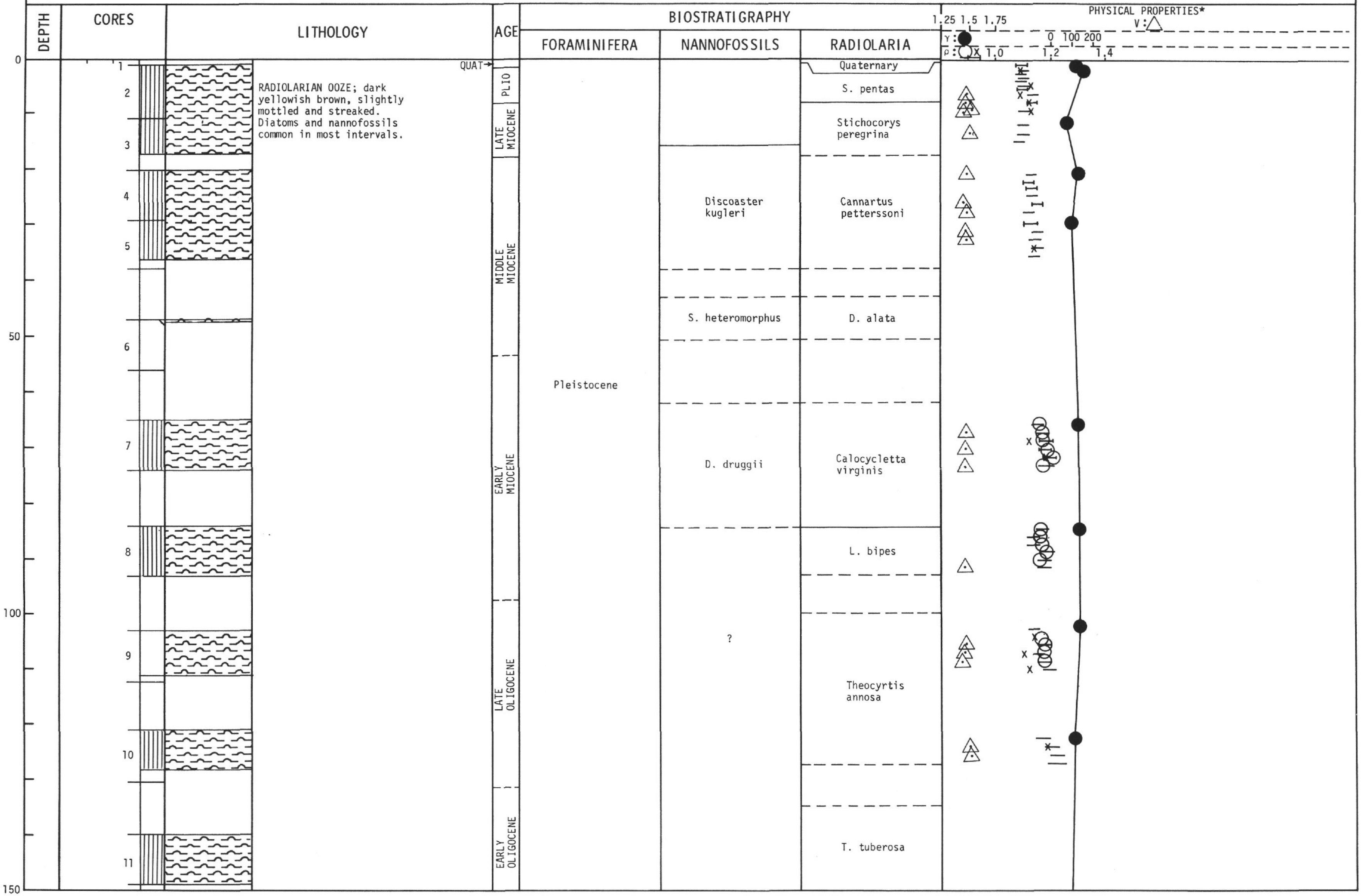
Core-Section	Section Weight Wet Bulk Density (g/cc)	GRAPE					Syringe				Natural Gamma Radiation		Sonic Velocity	
		Wet Bulk Density		Assigned Grain Density (g/cc)	Porosity		Interval Sampled (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Porosity (%)	Total Count	Net Net	Interval Sampled (cm)	(km/sec)
		Total Range (g/cc)	Undisturbed (g/cc)		Total Range (%)	Undisturbed (%)								
2-1		1.1		2.4	94		53	1.09	1.49	84.6	1425	150		
2-2		1.1		2.4	94									
2-3		1.1		2.4	94		24	1.13	1.87	87.4				
2-4		1.13		2.4	92		–	1.09	1.58	86.6			18	1.48
													72	1.47
													117	1.49
2-5		1.13	1.13	2.4	92	92	71	1.12	1.71	85.6			38	1.48
													81	1.46
													144	1.46
2-6		1.1		2.4	94		52	1.13	1.99	88.9			11	1.47
													76	1.46
													118	1.53
3-2		1.1		2.3	94.0						1350	75		
3-3		1.1		2.3	94.0								71	1.53
													110	1.50
3-4		1.07-1.10		2.3	94.0-96.3									
4-1		1.13		2.6	93.2						1400	125	28	1.47
													115	1.49
4-2		1.10-1.14	1.10-1.14	2.6	92.8-95.1	92.8-95.1								
4-3		1.13	1.13	2.6	93.2									
4-4		1.13		2.6	93.2									
4-5		1.13-1.17	1.13-1.17	2.6	90.7-93.2	90.7-93.2							43	1.46
													104	1.46
4-6		1.12		2.6	93.9								30	1.48
													81	1.47
													114	1.47
5-1		1.10-1.15	1.10-1.15	2.5	91.4-94.8	91.4-94.8					1400	100		
5-2		1.15		2.5	91.4								69	1.47
													104	1.47
5-3		1.14		2.5	92.1								35	1.47
													80	1.47
													130	1.48
5-4		1.15		2.5	91.4		99	1.14	1.84	85.4				
5-5		1.14		2.5	92.1									
7-1	1.16	1.15		2.5	91.4						1425	125		
7-2	1.17	1.16-1.18		2.5	89.4-90.7								33	1.48
													100	1.48
7-3	1.17	1.16-1.20	1.16-1.20	2.5	88.0-90.7	88.0-90.7	52	1.12	1.69	84.4				
7-4	1.19	1.16-1.20	1.16-1.20	2.5	88.0-90.7	88.0-90.7							37	1.46
													104	1.47
7-5	1.21	1.17-1.21	1.17-1.21	2.5	87.3-90.1	87.3-90.1	51	1.18	2.03	84.4				
7-6	1.17	1.15-1.21		2.5	87.3-91.4	87.3-91.4							28	1.46
													92	1.46

APPENDIX B – *Continued*

Core-Section	Section Weight Wet Bulk Density (g/cc)	GRAPE					Syringe				Natural Gamma Radiation		Sonic Velocity	
		Wet Bulk Density		Assigned Grain Density (g/cc)	Porosity		Interval Sampled (cm)	Wet Bulk Density (g/cc)	Grain Density (g/cc)	Porosity (%)				
		Total Range (g/cc)	Undisturbed (g/cc)		Total Range (%)	Undisturbed (%)					Total Count	Net	Interval Sampled (cm)	(km/sec)
8-1	1.16	1.15-1.18		2.4	88.6-90.8						1425	125	28	1.46
													92	1.46
8-2	1.16	1.12-1.15		2.4	90.8-93.0		22	1.13	1.78	85.8				
8-3	1.17	1.11-1.14		2.4	91.5-93.7									
8-4	1.18	1.17-1.18		2.4	88.6-89.3									
8-5	1.16	1.16-1.18		2.4	88.6-90.1		61	1.13	1.76	84.6				
8-6		1.16-1.17		2.4	89.3-90.1									
9-1		1.13		2.4	92.2						1425	125	19	1.46
9-2	1.16	1.15	1.15	2.4	90.8	90.8	48	1.14	1.81	86.4				
9-3	1.17	1.16-1.18	1.16-1.18	2.4	88.6-90.1	88.6-90.1							32	1.46
													78	1.47
													130	1.48
9-4	1.17	1.14-1.16		2.4	90.1-91.5		46	1.10	1.46	82.8			46	1.46
													111	1.46
9-5	1.17	1.16-1.18	1.16-1.18	2.4	88.6-90.1	88.6-90.1							72	1.44
9-6		1.17-1.20		2.4	87.2-89.3		19	1.12	1.54	81.6				
10-2		1.16-1.19	1.16-1.19	2.4	87.9-90.1	87.9-90.1					1400	100		
10-3		1.17-1.22	1.17-1.22	2.4	85.7-89.3	85.7-89.3	52	1.18	1.58	73.1			48	1.51
													101	1.50
10-4		1.19-1.23	1.19-1.23	2.4	85.0-87.9	85.0-87.9							56	1.51
													113	1.50
10-5		1.18-1.25	1.18-1.25	2.4	83.5-88.6	83.5-88.6								
12-1		1.15-1.17		2.3	88.5-90.1						1350	75		
12-2		1.17-1.20		2.3	86.2-88.5									
12-3		1.16-1.19		2.3	86.9-89.3		56	1.13	1.34	68.6				
12-4		1.19	1.19	2.3	86.9	86.9							21	1.50
													72	1.53
													95	1.51
12-5		1.20		2.3	86.2								41	1.53
													84	1.48
													123	1.53
12-6		1.18-1.20	1.18-1.20	2.3	86.2-87.7	86.2-87.7	52	1.13	1.38	71.7				
13-1		1.13-1.15		2.3	90.1-91.6		48	1.12	1.31	69.8	1375	100		
13-2		1.15		2.3	90.1									
13.3		1.15-1.18		2.3	87.7-90.1									
13.4		1.15		2.3	90.1								48	1.49
													88	1.50
													128	1.53
13-5		1.13-1.15		2.3	90.1-91.6		70	1.13	1.39	69.6			28	1.52
													55	1.53
13-6		1.13-1.15		2.3	90.1-91.6		34	1.25	2.39	83.4				
14-2		1.13-1.15		2.3	90.1-91.6									
14-3		1.12-1.15		2.3	90.1-92.4									

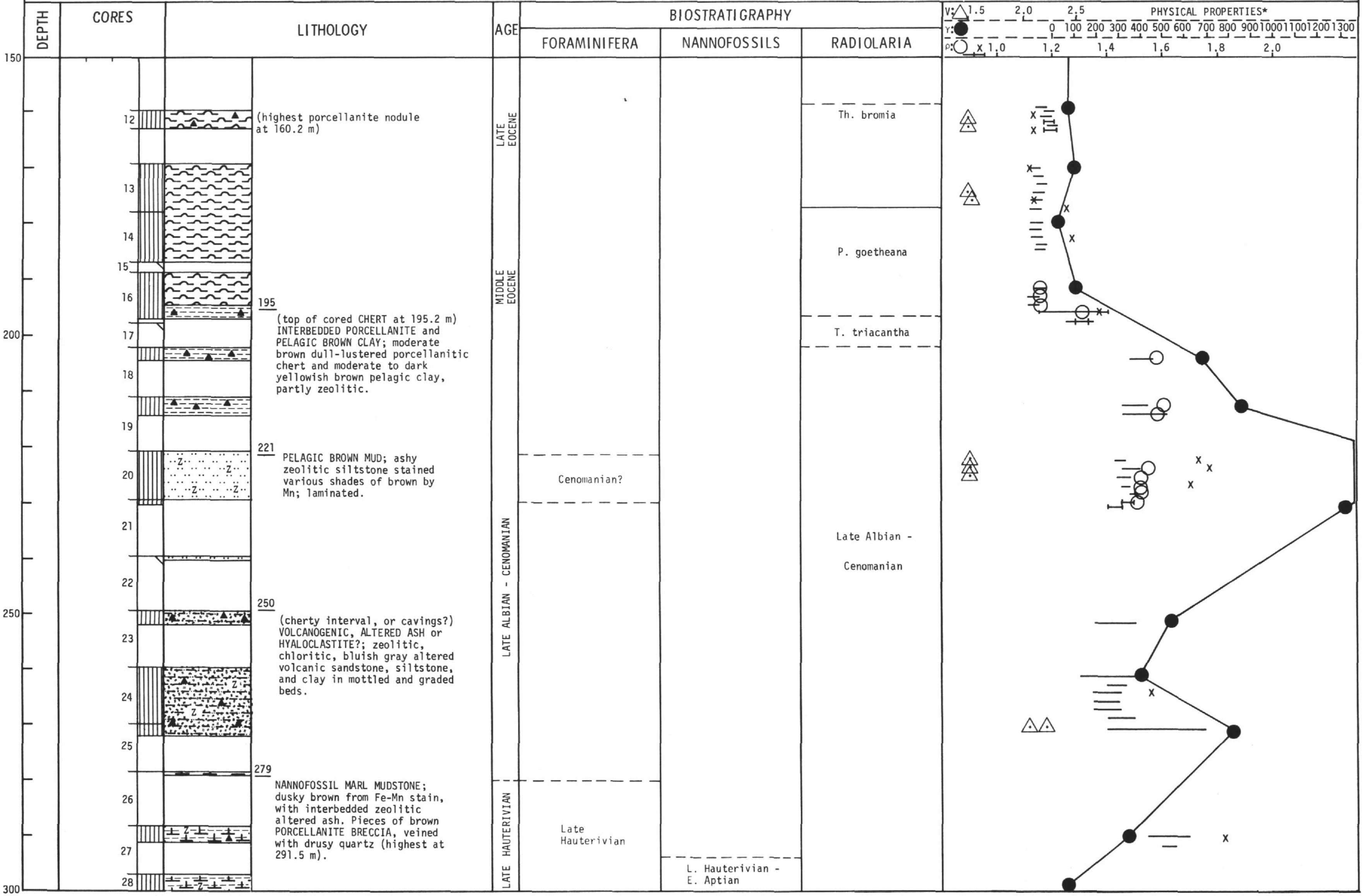
14-4		1.13-1.15	1.13-1.15	2.3	90.1-91.6	90.1-91.6	52	1.28	2.74	85.0				
14-5		1.15-1.17		2.3	88.5-90.1									
14-6		1.14-1.16		2.3	89.3-90.9									
16-2	1.16	1.14-1.16		2.3	89.3-90.9						1400	100		
16-3	1.16	1.12-1.15		2.3	90.1-92.4									
16-4	1.16	1.12-1.15		2.3	90.1-92.4									
16-5	1.31	1.15-1.40	1.15-1.40	2.3	70.5-90.1	70.5-90.1	8	1.37	2.87	81.6				
16-6		1.25-1.35	1.28-1.33	2.3	74.4-82.2	76.0-79.9								
18-2	1.58	1.48-1.57		2.65	66.4-71.9						1975	675		
19-2	1.60	1.45-1.55		2.65	67.6-73.8						2125	850		
19-3	1.58	1.45-1.62		2.65	63.3-73.8									
20-1		1.43-1.46		2.75	74.7-76.4		40	1.73	4.33	78.9	3000	1725	44	1.48
													77	1.52
													111	1.49
20-2	1.55	1.45-1.52		2.75	71.2-75.3		96	1.77	4.64	79.9			27	1.50
													71	1.54
													105	1.49
20-3	1.52	1.43-1.48		2.75	73.5-76.4								29	1.51
													67	1.50
													123	1.49
20-4	1.52	1.45-1.48		2.75	73.5-75.3		83	1.70	5.56	85.6				
20-5	1.52	1.48-1.53		2.75	70.6-73.5									
20-6	1.51	1.45-1.50	1.45-1.50	2.75	72.4-75.3	72.4-75.3								
21-1		1.40-1.45	1.40-1.45	2.75	75.3-78.2	75.3-78.2					2600	1325		
23-2		1.35-1.50		2.75	72.4-81.1						1800	525		
24-1		1.40-1.47		2.75	72.4-84.0						1700	400		
24-2		1.40-1.47		2.75	74.1-78.2									
24-3		1.35-1.45		2.75	75.3-81.1		100	1.56	4.14	83.2				
24-4		1.35-1.45		2.75	75.3-81.1									
24-5		1.35-1.45		2.75	75.3-81.1									
24-6		1.40-1.50		2.75	72.4-78.2									
24-CC														2.04
														2.06
														2.19
25-1		1.40-1.75		2.75	57.9-78.2						2100	825		
27-1		1.55-1.70		2.75	60.8-69.5		73	1.83	5.66	83.2	1625	350		
27-2		1.60-1.65		2.75	63.7-66.6									
28											1350	75		
29-2	1.97	2.2-2.3	2.2-2.3								1525	250	90	5.10-5.35
29-3	1.80	2.2-2.3	2.2-2.3											
1A-1		1.07-1.11	1.07-1.11	2.3	93.2-96.3	93.2-96.3					1400	125		
1A-2		1.07-1.11		2.3	93.2-96.3									
1A-3		1.08-1.10		2.3	94.0-95.6									
1A-4		1.08-1.11	1.08-1.11	2.3	93.2-95.6	93.2-95.6								

LEG XVII SITE 166 LAT. 3°45.7'N LONG. 175°04.8'W DEPTH 4962 m SHEET 1 OF 3



RADIOLARIAN OOZE; dark yellowish brown, slightly mottled and streaked. Diatoms and nannofossils common in most intervals.

LEG XVII SITE 166 LAT. 3°45.7'N LONG. 175°04.8'W DEPTH 4962 m SHEET 2 OF 3



(highest porcellanite nodule at 160.2 m)

195

(top of cored CHERT at 195.2 m) INTERBEDDED PORCELLANITE and PELAGIC BROWN CLAY; moderate brown dull-lustered porcellanitic chert and moderate to dark yellowish brown pelagic clay, partly zeolitic.

221

PELAGIC BROWN MUD; ashy zeolitic siltstone stained various shades of brown by Mn; laminated.

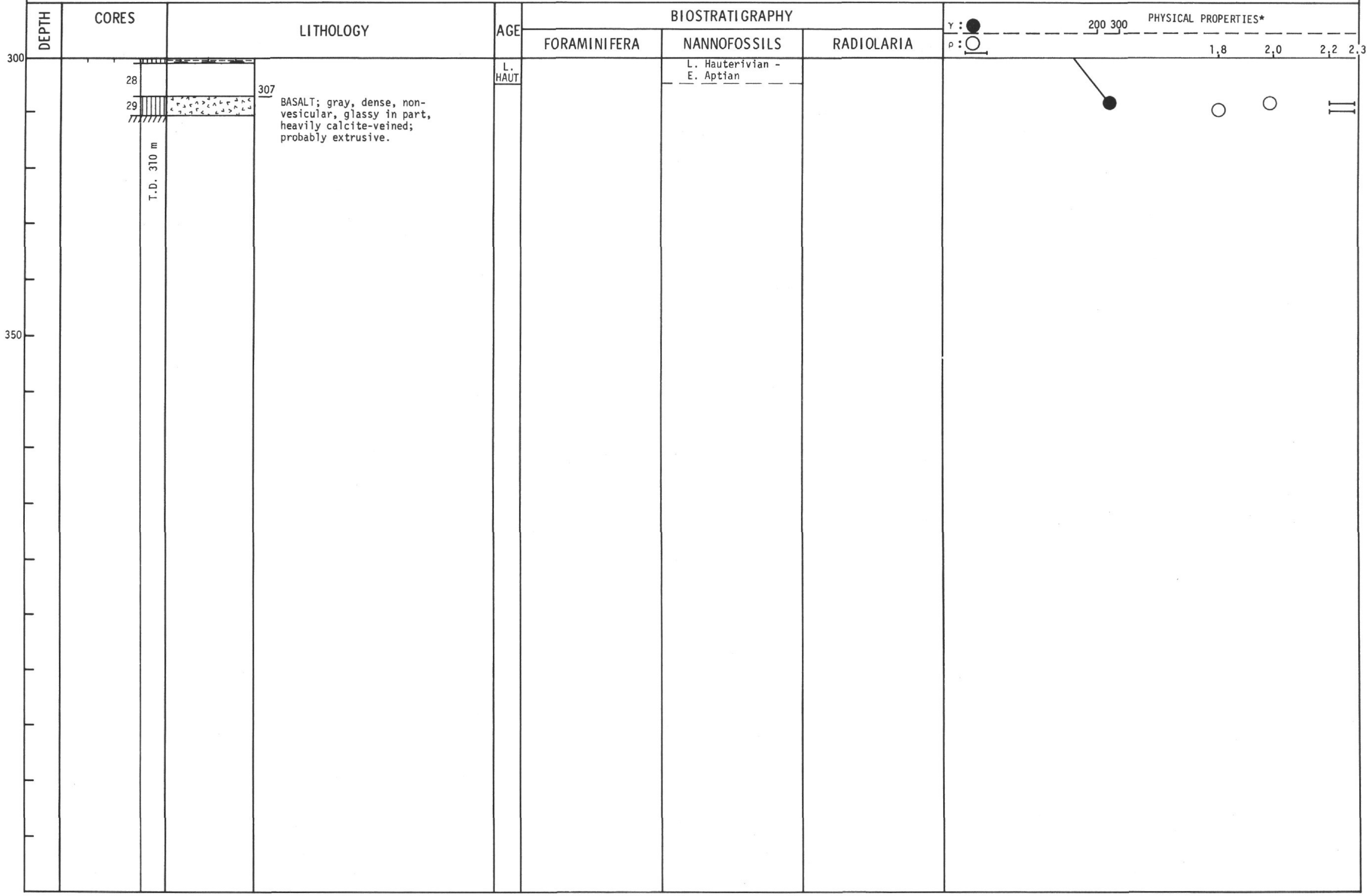
250

(cherty interval, or cavings?) VOLCANOGENIC, ALTERED ASH or HYALOCLASTITE?; zeolitic, chloritic, bluish gray altered volcanic sandstone, siltstone, and clay in mottled and graded beds.

279

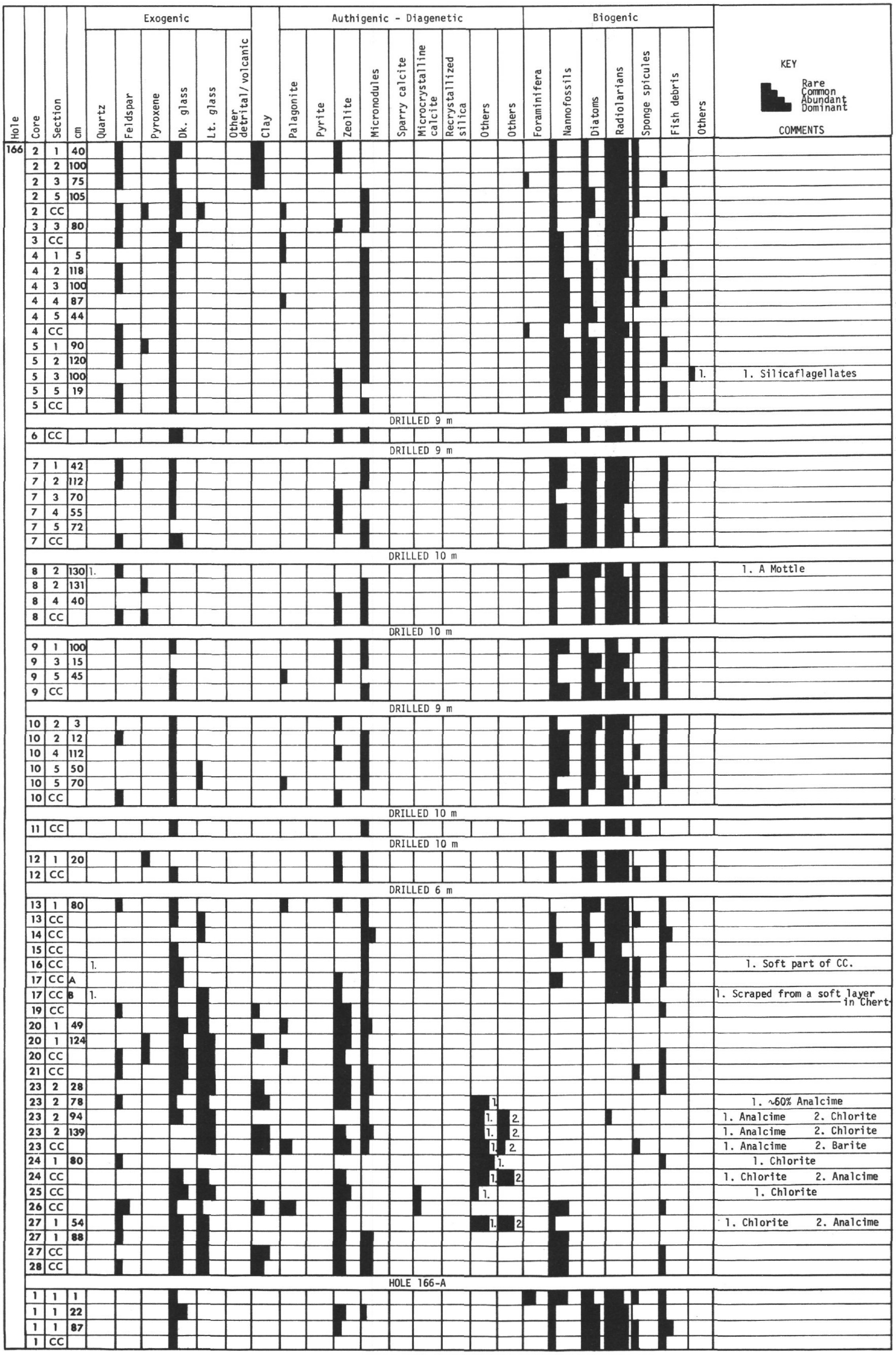
NANNOFOSSIL MARL MUDSTONE; dusky brown from Fe-Mn stain, with interbedded zeolitic altered ash. Pieces of brown PORCELLANITE BRECCIA, veined with drusy quartz (highest at 291.5 m).

LEG XVII SITE 166 LAT. 3°45.7'N LONG. 175°04.8'W DEPTH 4962 m SHEET 3 OF 3



BASALT; gray, dense, non-vesicular, glassy in part, heavily calcite-veined; probably extrusive.

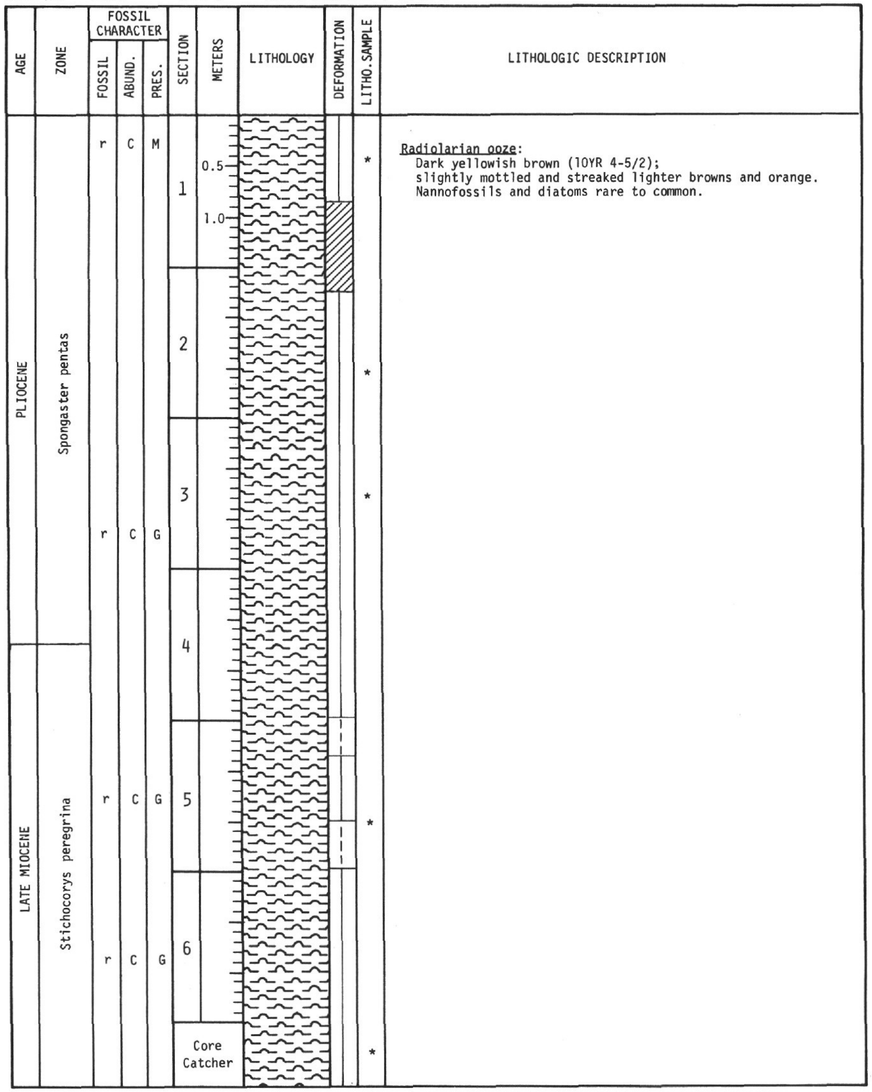
SITE 166
SMEAR SLIDE SUMMARY



Site 166 Hole Core 1 Cored Interval: 0 to 1 m

AGE	ZONE	FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
					Core Catcher					A few foraminifers and radiolarians on cloth in core catcher.

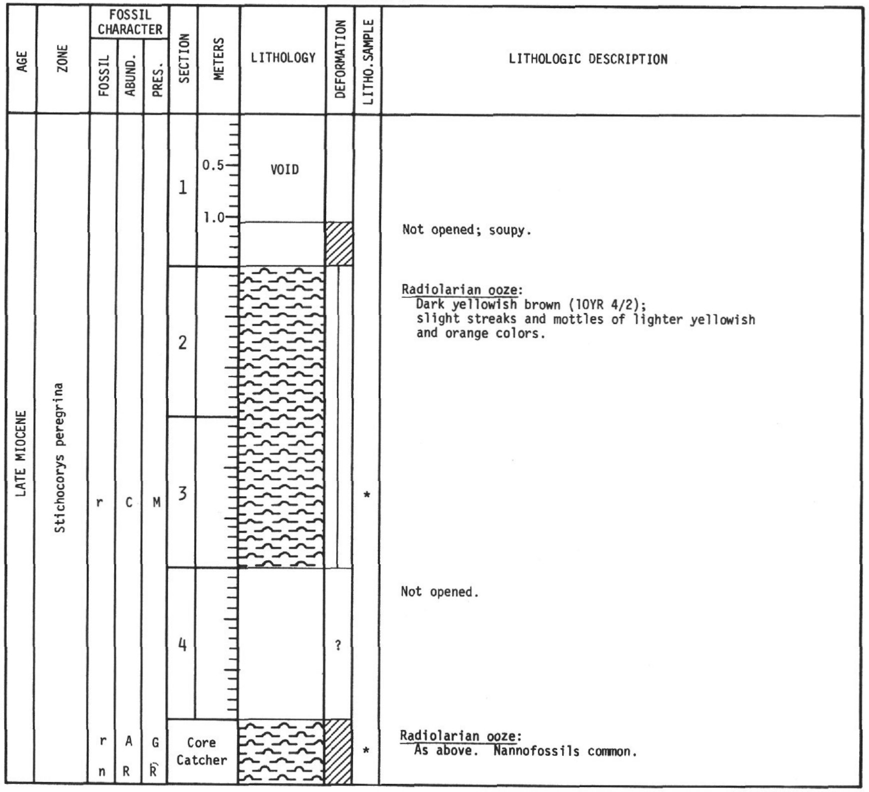
Site 166 Hole Core 2 Cored Interval: 1 to 11 m



AGE	ZONE	FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
PLIOCENE	Spongaster pentas	r	C	M	1	0.5 1.0		▨	*	**Radiolarian ooze:** Dark yellowish brown (10YR 4-5/2); slightly mottled and streaked lighter browns and orange. Nannofossils and diatoms rare to common.
					2				*	
		r	C	G	3				*	
LATE MIOCENE	Stichocorys peregrina				4					
		r	C	G	5				*	
		r	C	G	6					
					Core Catcher				*	

Explanatory notes in Chapter 1

Site 166 Hole Core 3 Cored Interval: 11 to 20 m



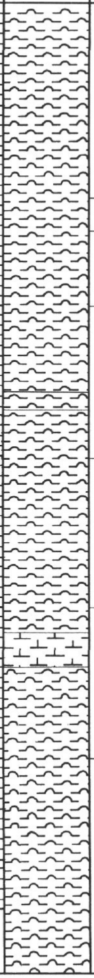
AGE	ZONE	FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LATE MIOCENE	Stichocorys peregrina				1	0.5 1.0	VOID	▨		Not opened; soupy.
					2					**Radiolarian ooze:** Dark yellowish brown (10YR 4/2); slight streaks and mottles of lighter yellowish and orange colors.
		r	C	M	3				*	
					4			?		Not opened.
		r n	A R	G R	Core Catcher			▨	*	**Radiolarian ooze:** As above. Nannofossils common.

Explanatory notes in Chapter 1

Site 166 Hole Core 4 Cored Interval: 20 to 29 m

AGE	ZONE	FOSSIL	ABUND.	PRES.	SECTION	LITHO. SAMPLE
MIDDLE MIOCENE	Discoaster kugleri Cannartus pettersoni	r n	C F	G P	1	*
		n	F	P	2	*
		n r	F C	P M	3	*
		n	F	P	4	*
		n r	F C	P M	5	*
		n	R	P	6	
		n r	R C	P G	Core Catcher	*

Meters: 0.5, 1.0



LITHOLOGIC DESCRIPTION

Nannofossil-bearing Radiolarian Ooze:

Dark yellowish brown (10YR 4/2), with some intervals streaked and slightly mottled dusky yellowish brown (10YR 2/2) and grayish orange (10YR 7/4)

Sect. 3; 0 to 88 cm same as Sect. 1.

88 to 103 cm:
Nannofossil Radiolarian Ooze:
grayish orange (10YR 7/4)

Sect. 5; 0 to 25 cm same as Sect. 1.
25 to 60 cm:
Diatomaceous Radiolarian Nannofossil Ooze:
pale yellowish orange (10YR 8/6) to yellowish brown.

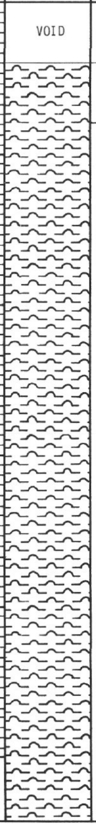
60 to 150 cm same as Sect. 1.

Explanatory notes in Chapter 1

Site 166 Hole Core 5 Cored Interval: 29 to 38 m

AGE	ZONE	FOSSIL	ABUND.	PRES.	SECTION	LITHO. SAMPLE
MIDDLE MIOCENE	Discoaster kugleri Cannartus pettersoni	r n	C F	G P	1	*
		n	F	P	2	*
		r n	C F	G P	3	*
		n	F	P	4	
		n r	F C	P G	5	*
		n r	F C	P G	Core Catcher	*

Meters: 0.5, 1.0

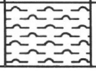


LITHOLOGIC DESCRIPTION

Nannofossil-Radiolarian Ooze to
Radiolarian-Nannofossil Ooze:
Moderate yellowish brown (10YR 5/4) and adjacent colors (10YR 8-4/6-2);
Locally with mottles, streaks, and diapiric laminae.
Diatoms common.

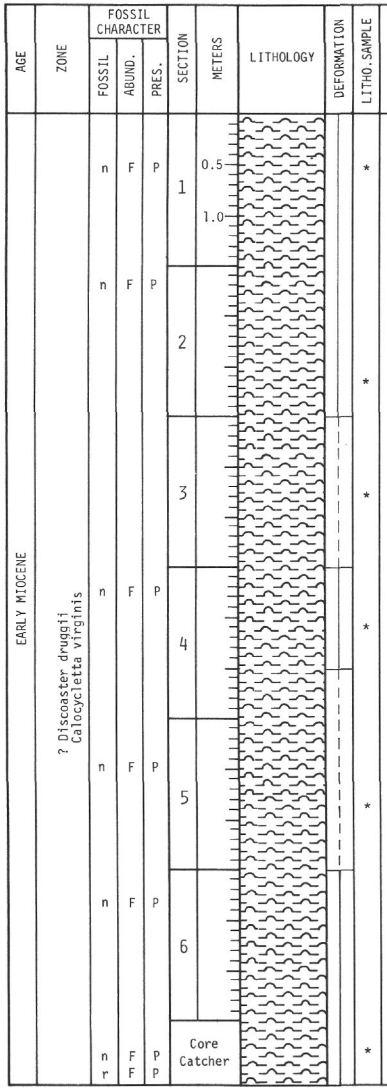
Site 166 Hole Core 6 Cored Interval: 47 to 56 m

AGE	ZONE	FOSSIL	ABUND.	PRES.	SECTION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
M. MIOCENE	S. hetero-morphus D. alata	n	F	P	Core Catcher	*	Nannofossil-rich Radiolarian Ooze



Explanatory notes in Chapter 1

Site 166 Hole Core 7 Cored Interval: 65 to 74 m

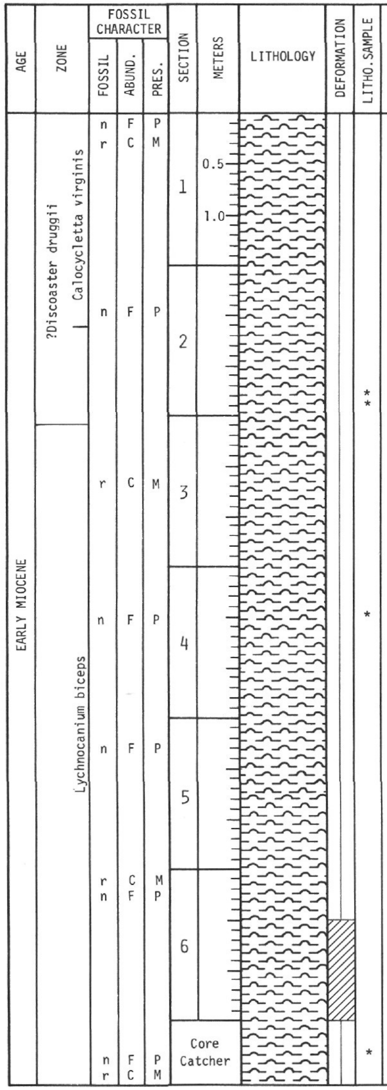


LITHOLOGIC DESCRIPTION

Nannofossil-bearing Radiolarian Ooze:
Dark to moderate yellowish brown (10YR 4/2 - 5/4); some lighter mottles and streaks. Local dark (Mn) streaks. Diatoms common.

Explanatory notes in Chapter 1

Site 166 Hole Core 8 Cored Interval: 84 to 93 m

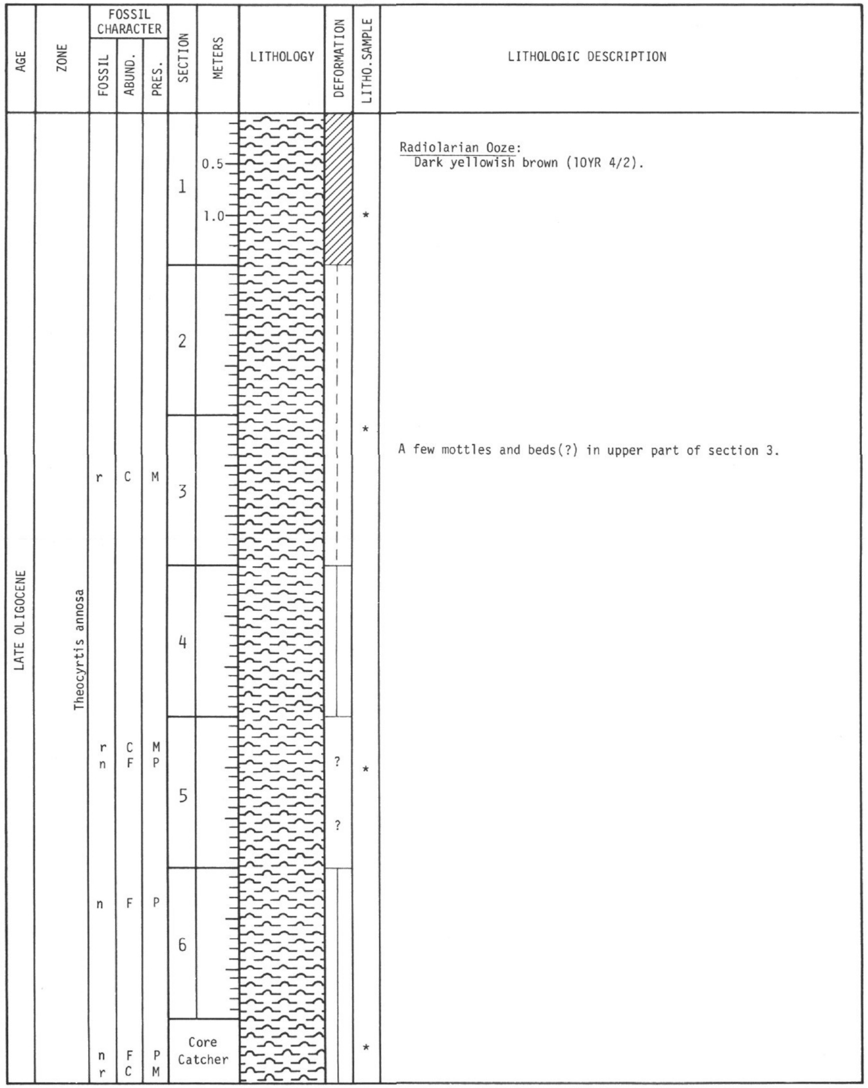


LITHOLOGIC DESCRIPTION

Radiolarian Ooze:
Dark yellowish brown (10YR 4/2); slight grayish-orange (10YR 7/4) mottling of nannofossil-rich radiolarian ooze. Some dark brown (Mn) streaks.

Explanatory notes in Chapter 1

Site 166 Hole Core 9 Cored Interval: 103 to 112 m

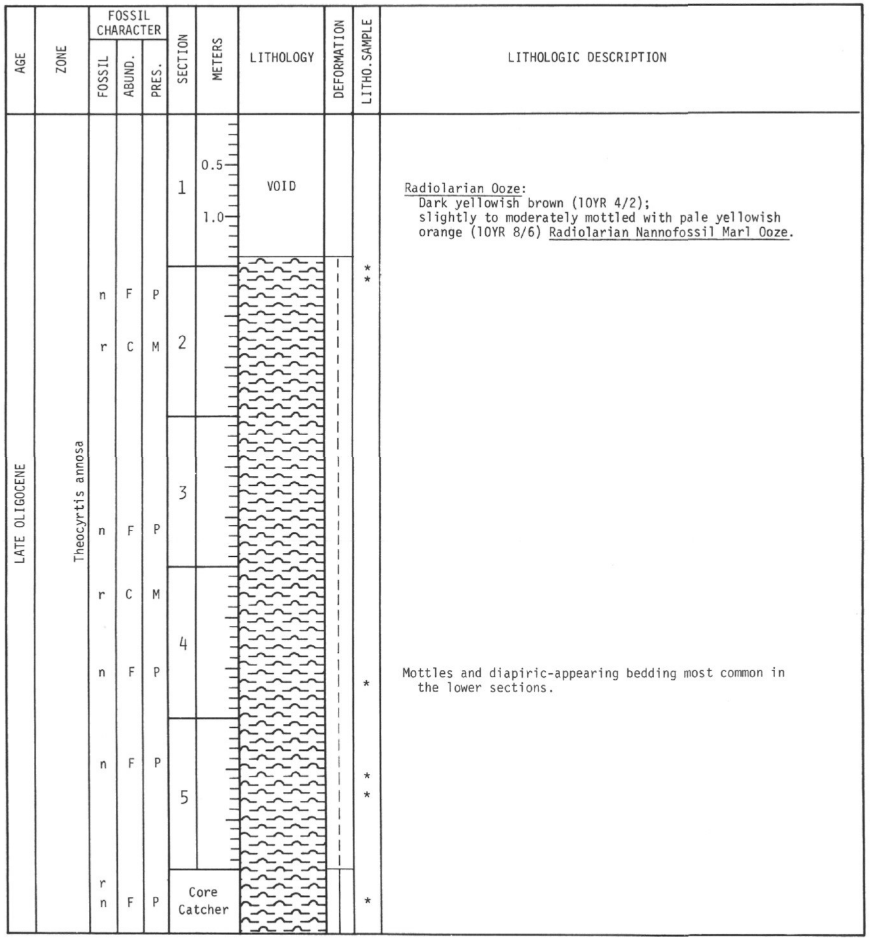


Radiolarian Ooze:
Dark yellowish brown (10YR 4/2).

A few mottles and beds(?) in upper part of section 3.

Explanatory notes in Chapter 1

Site 166 Hole Core 10 Cored Interval: 121 to 130 m

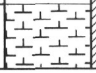


Radiolarian Ooze:
Dark yellowish brown (10YR 4/2);
slightly to moderately mottled with pale yellowish orange (10YR 8/6) Radiolarian Nannofossil Marl Ooze.

Mottles and diapiric-appearing bedding most common in the lower sections.

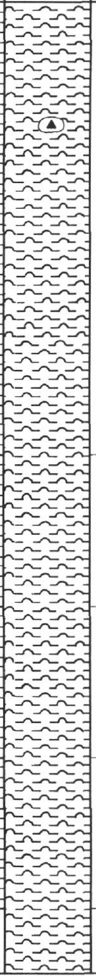
Explanatory notes in Chapter 1

Site 166 Hole Core 11 Cored Interval: 140 to 149 m

AGE	ZONE	FOSSIL CHARACTER			SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		FOSSIL	ABUND.	PRES.						
					1	0.5 1.0		▨		Sect. 1 to Sect. 6 Watery; not opened
					2			▨		
					3			▨		
					4			▨		
					5			▨		
					6			▨		
EARLY OLIGOCENE	*Theocyrtis tuberosa*	n r	C A	P M	Core Catcher			▨	*	Diatomaceous radiolarian-Nannofossil Ooze.

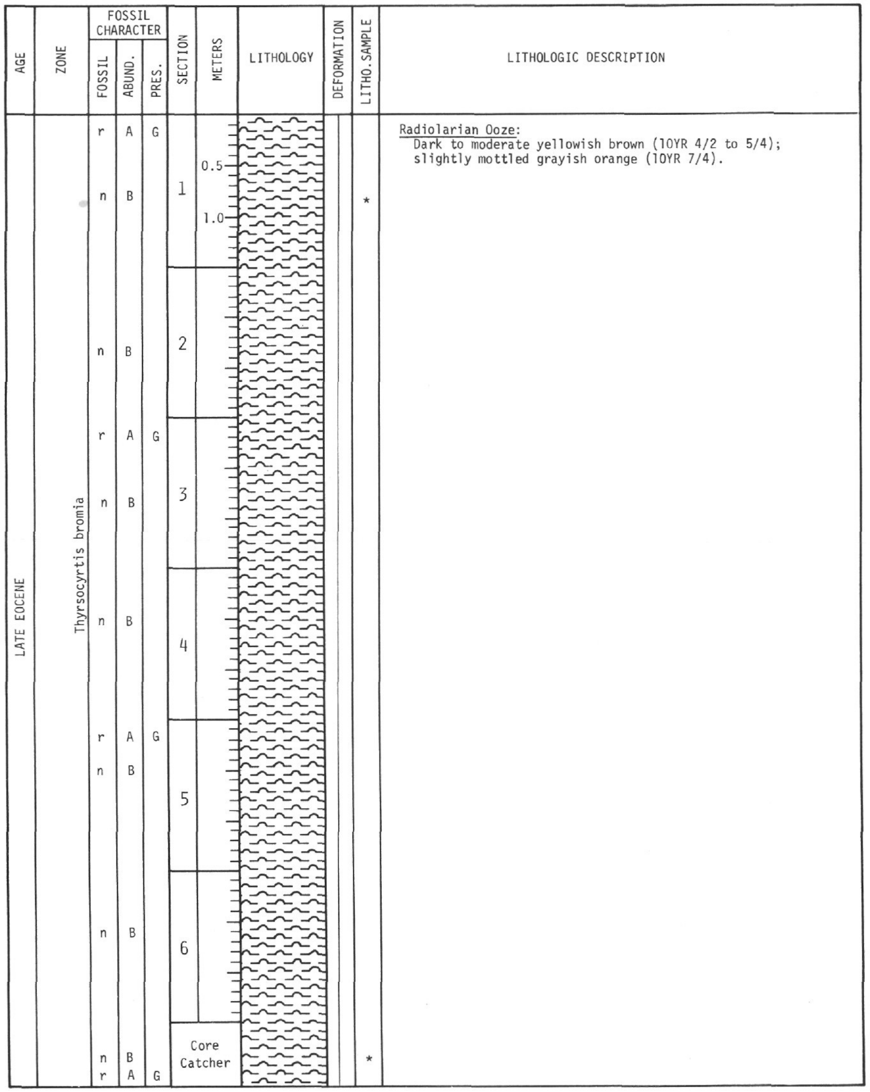
Explanatory notes in Chapter 1

Site 166 Hole Core 12 Cored Interval: 159 to 163 m

AGE	ZONE	FOSSIL CHARACTER			SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
		FOSSIL	ABUND.	PRES.						
LATE EOCENE	*Tyrsocyrtis bromia*	r n	A F	G M	1	0.5 1.0			*	Radiolarian Ooze: Moderate yellowish brown (10YR 5/4); slight streaks and mottling of lighter and grayer colors in some intervals. Diatoms common At 120 cm: Porcelanite nodule
		n	F	P	2					
		r n	A F	G P	3					
		n	F	P	4			¦		
		r n	A F	G P	5					
					6			¦		
		n r	F	P	Core Catcher				*	

Explanatory notes in Chapter 1

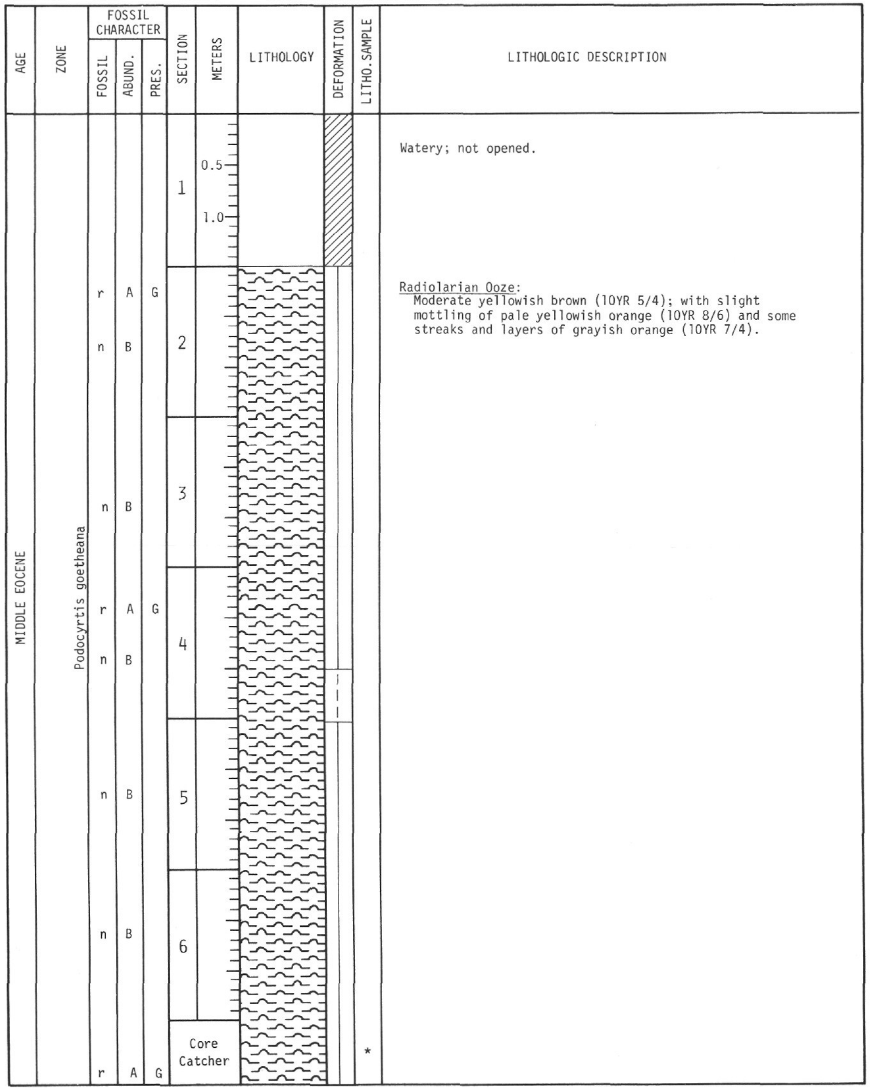
Site 166 Hole Core 13 Cored Interval: 169 to 178 m



Radiolarian Ooze:
Dark to moderate yellowish brown (10YR 4/2 to 5/4); slightly mottled grayish orange (10YR 7/4).

Explanatory notes in Chapter 1

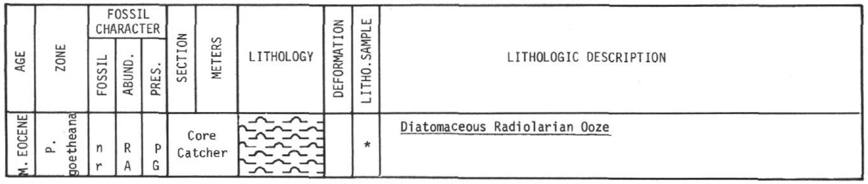
Site 166 Hole Core 14 Cored Interval: 178 to 187 m



Watery; not opened.

Radiolarian Ooze:
Moderate yellowish brown (10YR 5/4); with slight mottling of pale yellowish orange (10YR 8/6) and some streaks and layers of grayish orange (10YR 7/4).

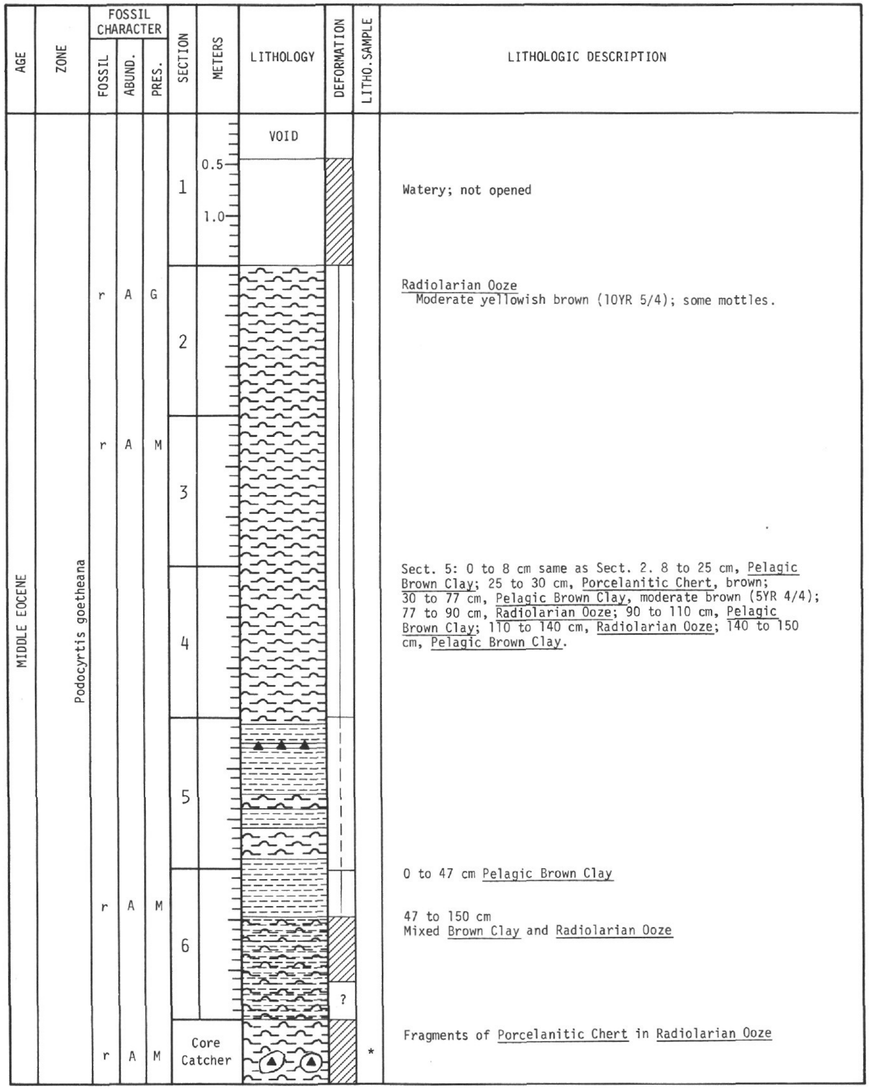
Site 166 Hole Core 15 Cored Interval: 187 to 189 m



Diatomaceous Radiolarian Ooze

Explanatory notes in Chapter 1

Site 166 Hole Core 16 Cored Interval: 189 to 198 m



Watery; not opened

Radiolarian Ooze
Moderate yellowish brown (10YR 5/4); some mottles.

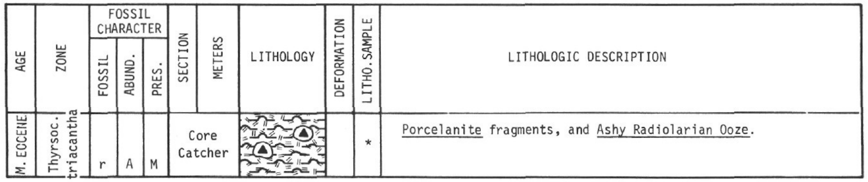
Sect. 5: 0 to 8 cm same as Sect. 2. 8 to 25 cm, Pelagic Brown Clay; 25 to 30 cm, Porcelanitic Chert, brown; 30 to 77 cm, Pelagic Brown Clay, moderate brown (5YR 4/4); 77 to 90 cm, Radiolarian Ooze; 90 to 110 cm, Pelagic Brown Clay; 110 to 140 cm, Radiolarian Ooze; 140 to 150 cm, Pelagic Brown Clay.

0 to 47 cm Pelagic Brown Clay

47 to 150 cm
Mixed Brown Clay and Radiolarian Ooze

Fragments of Porcelanitic Chert in Radiolarian Ooze

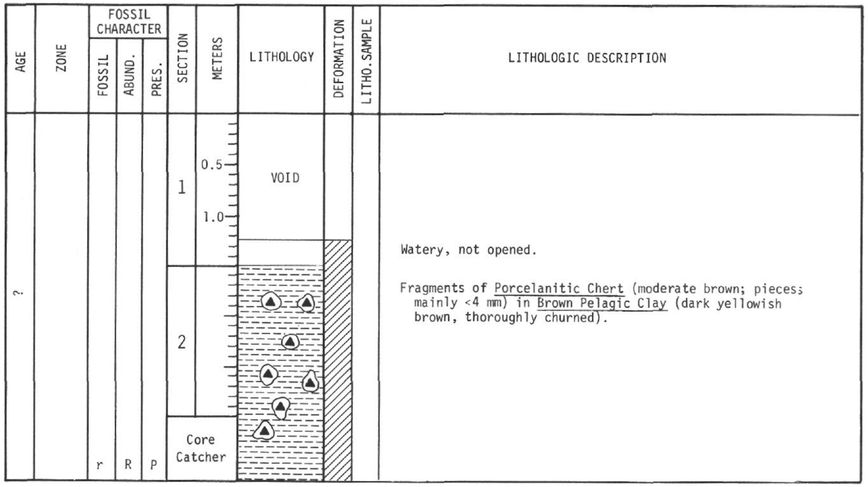
Site 166 Hole Core 17 Cored Interval: 198 to 202 m



Porcelanite fragments, and Ashy Radiolarian Ooze.

Explanatory notes in Chapter 1

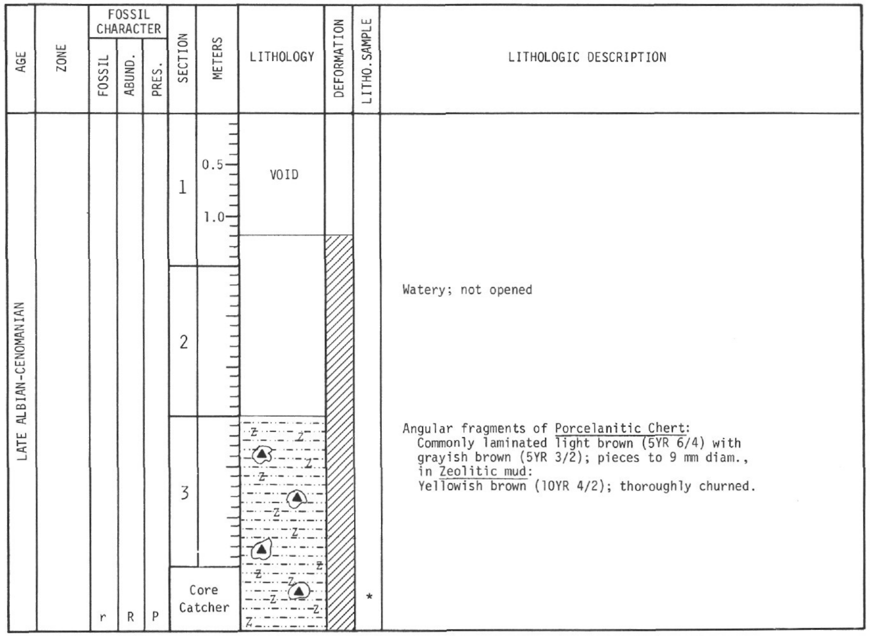
Site 166 Hole Core 18 Cored Interval: 202 to 211 m



Watery, not opened.

Fragments of Porcelanitic Chert (moderate brown; pieces; mainly <4 mm) in Brown Pelagic Clay (dark yellowish brown, thoroughly churned).

Site 166 Hole Core 19 Cored Interval: 211 to 221 m

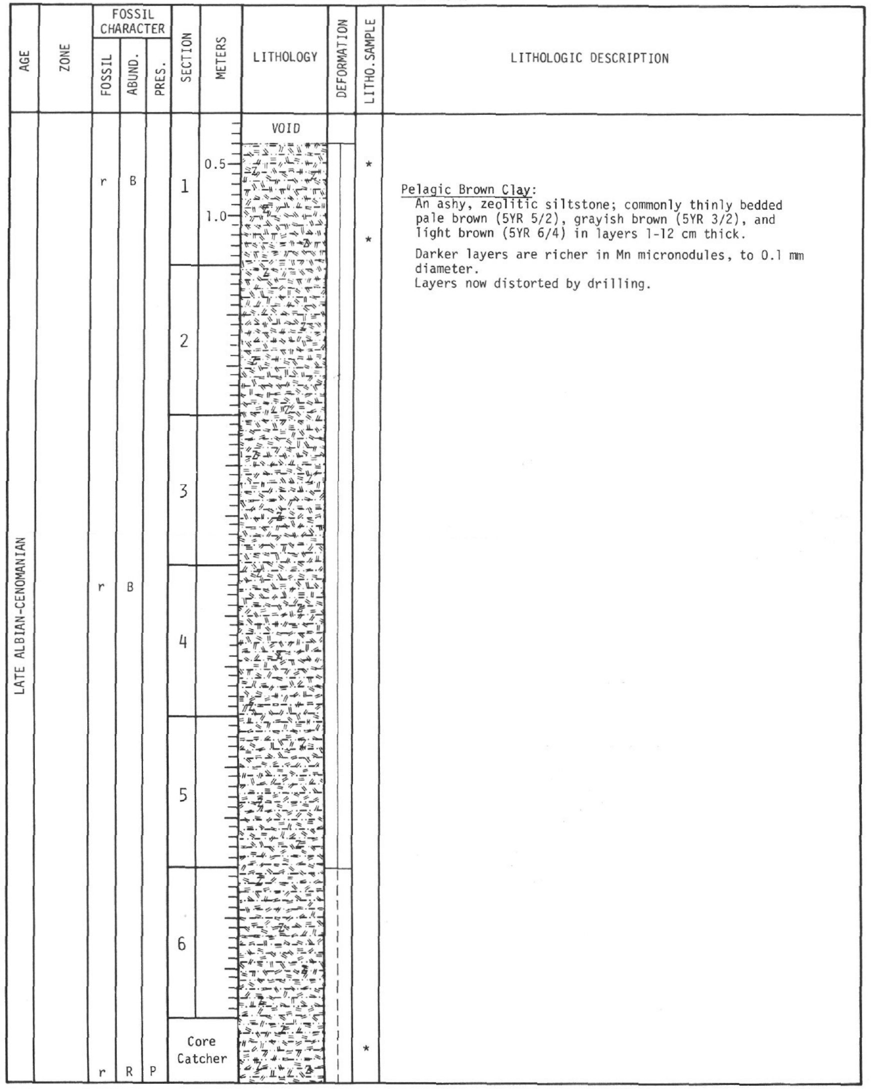


Watery; not opened

Angular fragments of Porcelanitic Chert:
Commonly laminated light brown (5YR 6/4) with grayish brown (5YR 3/2); pieces to 9 mm diam., in Zeolitic mud:
Yellowish brown (10YR 4/2); thoroughly churned.

Explanatory notes in Chapter 1

Site 166 Hole Core 20 Cored Interval: 221 to 230 m

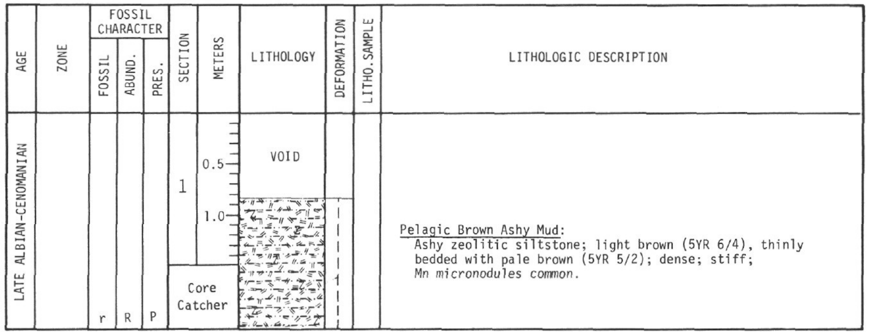


Pelagic Brown Clay:
An ashy, zeolitic siltstone; commonly thinly bedded pale brown (5YR 5/2), grayish brown (5YR 3/2), and light brown (5YR 6/4) in layers 1-12 cm thick.

Darker layers are richer in Mn micronodules, to 0.1 mm diameter.
Layers now distorted by drilling.

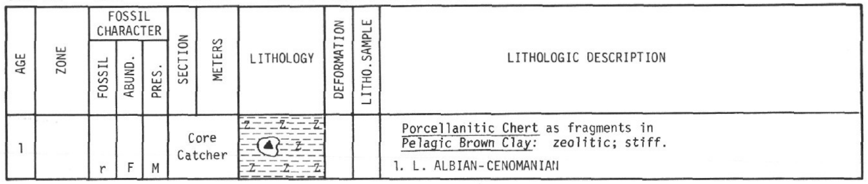
Explanatory notes in Chapter 1

Site 166 Hole Core 21 Cored Interval: 230 to 240 m



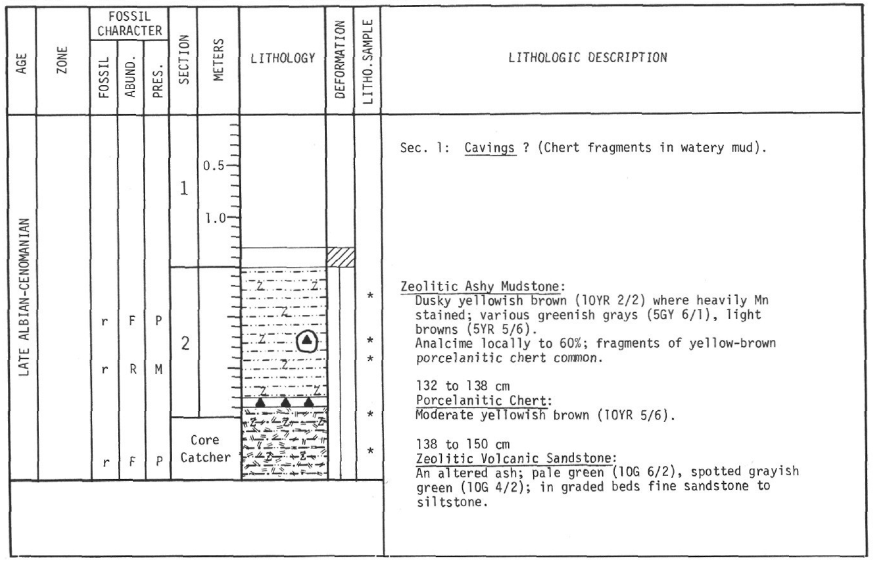
Pelagic Brown Ashy Mud:
Ashy zeolitic siltstone; light brown (5YR 6/4), thinly bedded with pale brown (5YR 5/2); dense; stiff; Mn micronodules common.

Site 166 Hole Core 22 Cored Interval: 240 to 250 m



Porcellanitic Chert as fragments in Pelagic Brown Clay: zeolitic; stiff.
1. L. ALBIAN-CENOMANIAN

Site 166 Hole Core 23 Cored Interval: 250 to 260 m



Sec. 1: Cavings ? (Chert fragments in watery mud).

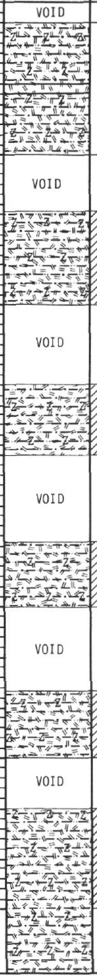
Zeolitic Ashy Mudstone:
Dusky yellowish brown (10YR 2/2) where heavily Mn stained; various greenish grays (5GY 6/1), light browns (5YR 5/6).
Analcime locally to 60%; fragments of yellow-brown porcelanitic chert common.

132 to 138 cm
Porcelanitic Chert:
Moderate yellowish brown (10YR 5/6).

138 to 150 cm
Zeolitic Volcanic Sandstone:
An altered ash; pale green (10G 6/2), spotted grayish green (10G 4/2); in graded beds fine sandstone to siltstone.

Explanatory notes in Chapter 1

Site 166 Hole Core 24 Cored Interval: 260 to 270 m

AGE	ZONE	FOSSIL CHARACTER FOSSIL	 ABUND.	 PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LATE ALBIAN-CENOMANIAN					1	0.5 1.0	 VOID		*	Zeolitic Volcanic Sandstone, Siltstone, and Clay: Altered hyaloclastite or altered ash; medium bluish gray (5B 5/1), with patches of grayish blue-green (5BG 5/2), pale blue (5B 5/1), etc.; chloritic. 80 to 90 cm Ash
					2		VOID			All sections only partly full, and badly disturbed by drilling. Same as dominant lithology of Sec. 1.
					3		VOID			Same as dominant lithology of Sect. 1.
					4		VOID			Same as dominant lithology of Sect. 1.
					5		VOID			Same as dominant lithology of Sect. 1.
					6		VOID			Same as dominant lithology of Sect. 1.
		r	R	P	Core Catcher				*	Same as dominant lithology of Sect. 1; pieces not deformed; show mottling and graded beds.

Explanatory notes in Chapter 1

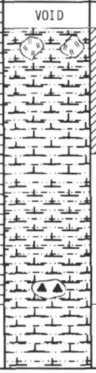
Site 166 Hole Core 25 Cored Interval: 270 to 279 m

AGE	ZONE	FOSSIL CHARACTER FOSSIL	 ABUND.	 PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LATE ALBIAN-CENOMANIAN		r	C	P	1	0.5 1.0	 VOID			Zeolitic Volcanic Sandstone and Siltstone: Altered ash, as pieces of fine sandstone and siltstone, commonly graded, in medium blue gray (5B 5/1) mud; homogenized by drilling.
					Core Catcher				*	Same as Sect. 1; pieces not deformed; show graded beds 1-2 cm thick.

Site 166 Hole Core 26 Cored Interval: 279 to 289 m

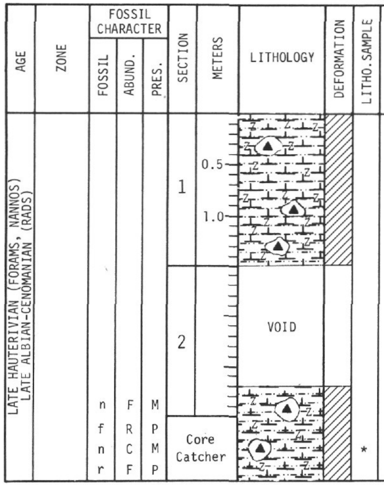
AGE	ZONE	FOSSIL CHARACTER FOSSIL	 ABUND.	 PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
1		f n r	R C F	P M P	Core Catcher				*	Nannofossil marl mudstone: Dusky brown (5YR 2/2); zeolitic.

Site 166 Hole Core 27 Cored Interval: 289 to 298 m

AGE	ZONE	FOSSIL CHARACTER FOSSIL	 ABUND.	 PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LATE HAUTERIVIAN (FORAMS, NANNOS) LATE ALBIAN-CENOMANIAN (RADS)		f n	R C	P M	1	0.5 1.0	 VOID		* *	Zeolitic Nannofossil Marl Mud: thoroughly churned by drilling. Several fragments of altered Ash at 30 to 60 cm: Grayish blue-green (5BG 5/2); with chlorite and analcime.
		f n f	P C R	P M P	2					Same as dominant lithology of Sect. 1. Fragment of septarian nodule(?) at 130 to 140 cm; fractured chert veined with drusy quartz.
		n	C	M	Core Catcher				*	Same as dominant lithology of Sect. 1.

Explanatory notes in Chapter 1

Site 166 Hole Core 28 Cored Interval: 298 to 307 m



LITHOLOGIC DESCRIPTION

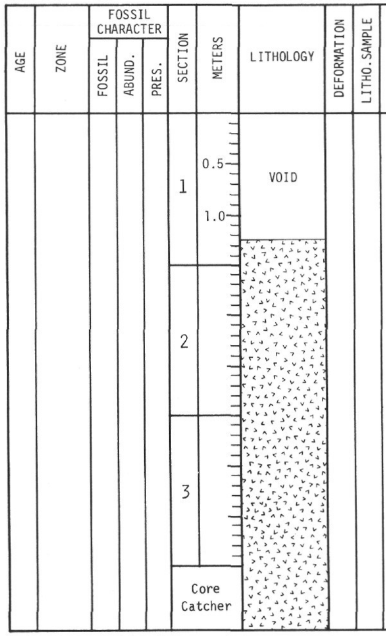
Very watery.

Angular fragments of Porcelanitic Chert::
Dusky yellowish brown (10YR 2/2);
dense; dull matte luster;
pieces of angular breccia, veined with crustose drusy quartz (septarian nodules?). Chert fragments are in Zeolitic Nannofossil Marl Mud: Dusky brown Ch(5YR 2/2).

Zeolitic Nannofossil Marl Mud:
Dusky brown (5YR 2/2); stiff in section 2 and corecatcher, but thoroughly homogenized.

Same as Sect. 1; stiff in Sect. 2 and core catcher, but thoroughly homogenized.

Site 166 Hole Core 29 Cored Interval: 307 to 310.5 m

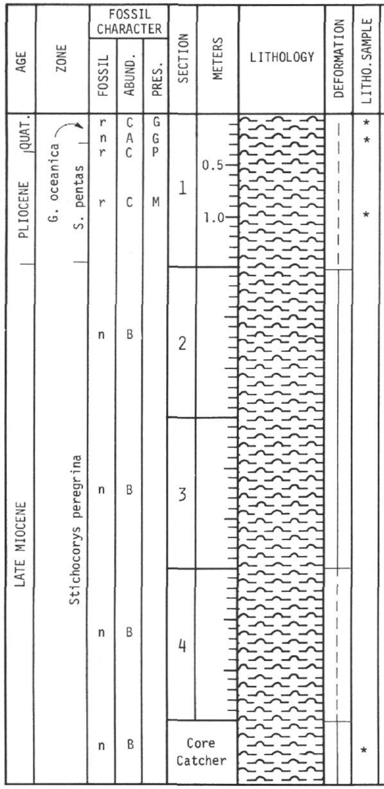


LITHOLOGIC DESCRIPTION

Basalt:
Medium gray (N5, dry) to dark gray (N3, wet); locally tinged with green and brown shades; fine grained;
no vesicules, but a few large calcite amygdules to 1.5 cm diam.;
abundant veining of ~1 cm thick calcite with centers of celadonite; fractured black glass selvages at Sect. 1 at 125 cm, Sect. 2 at 110 to 125 cm, Sect. 3 at 12, 80, and 125 to 140 cm that may be edges of pillows. Possible ingested sediment: Sect. 1 at 125 cm and Sect. 3 at 124 to 130 cm, now baked red-brown.
Interpreted as extrusive (a flow).

Explanatory notes in Chapter 1

Site 166 Hole A Core 1 Cored Interval: 0 to 9 m



LITHOLOGIC DESCRIPTION

0 to 14 cm
Diatomaceous Foraminiferal Nannofossil Radiolarian Ooze:
Light olive gray (5Y 6/1); soft.
14 to 150 cm
Diatomaceous Radiolarian Ooze:
Moderate to dark yellowish brown (10YR 5/4 to 4/2); slight to moderate mottling and layering of orangish colors.

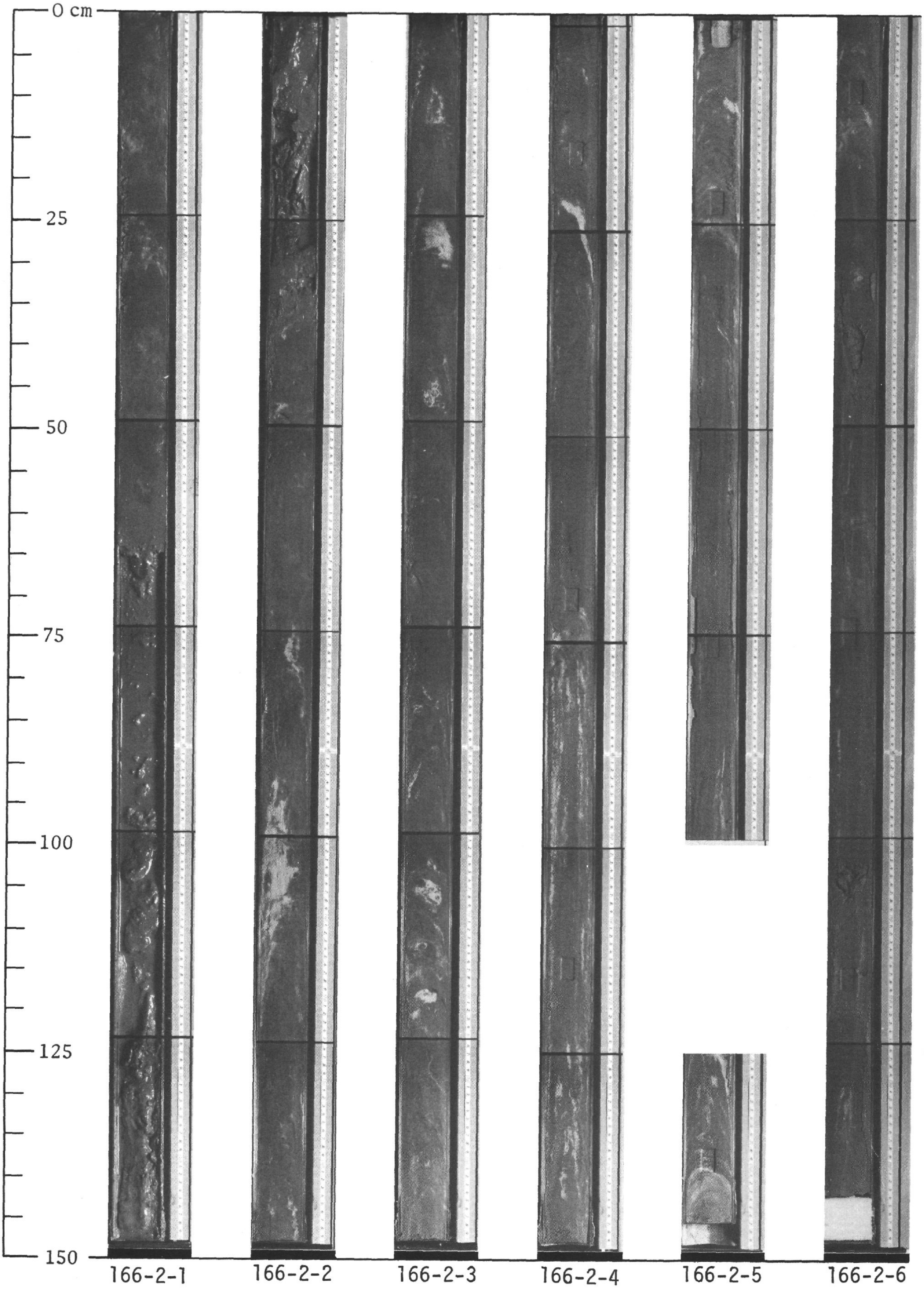
Same as dominant lithology of Sect. 1.

Same as dominant lithology of Sect. 1.

Same as dominant lithology of Sect. 1.

Same as dominant lithology of Sect. 1.

Explanatory notes in Chapter 1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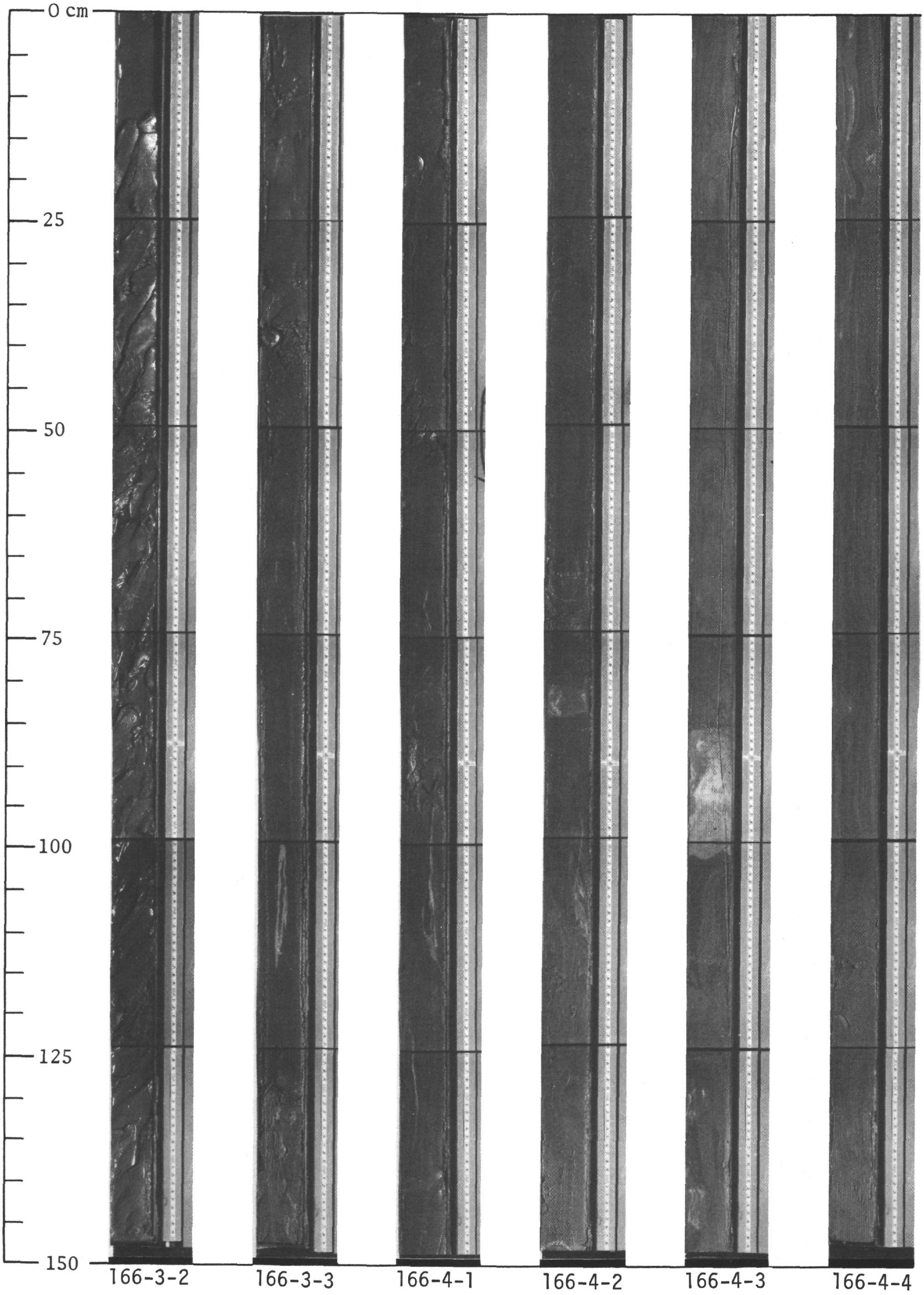
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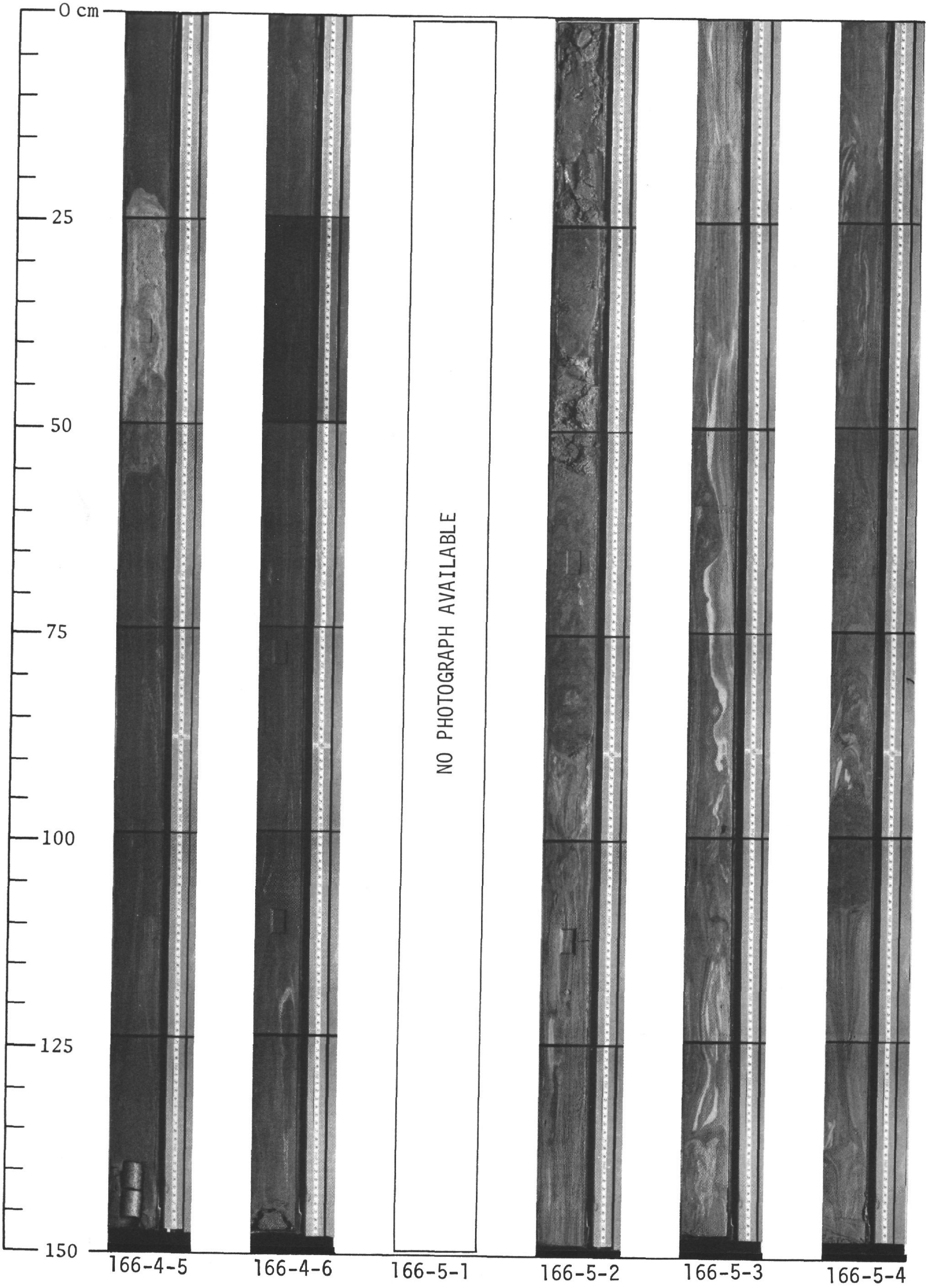
166-4-4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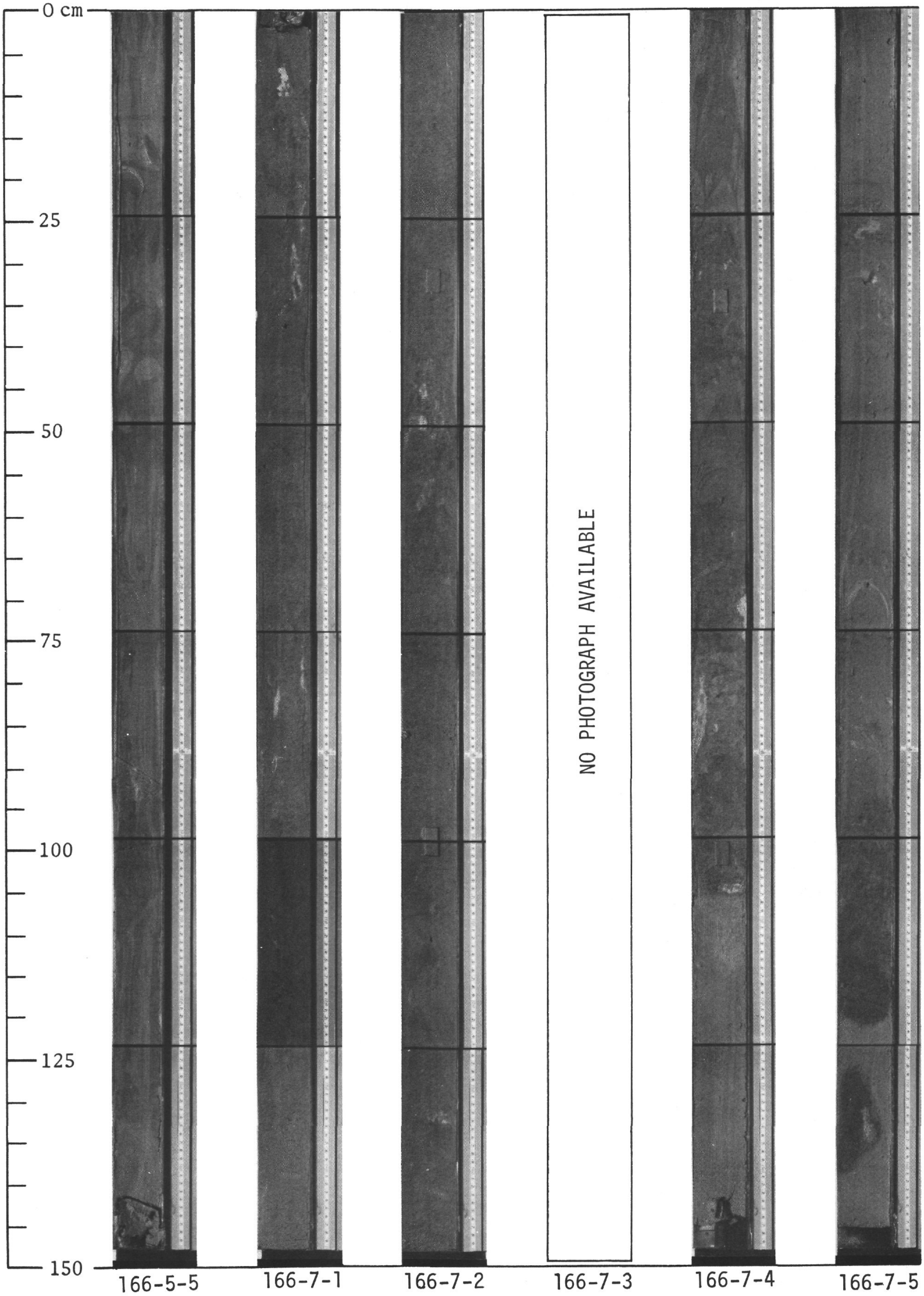
166-5-4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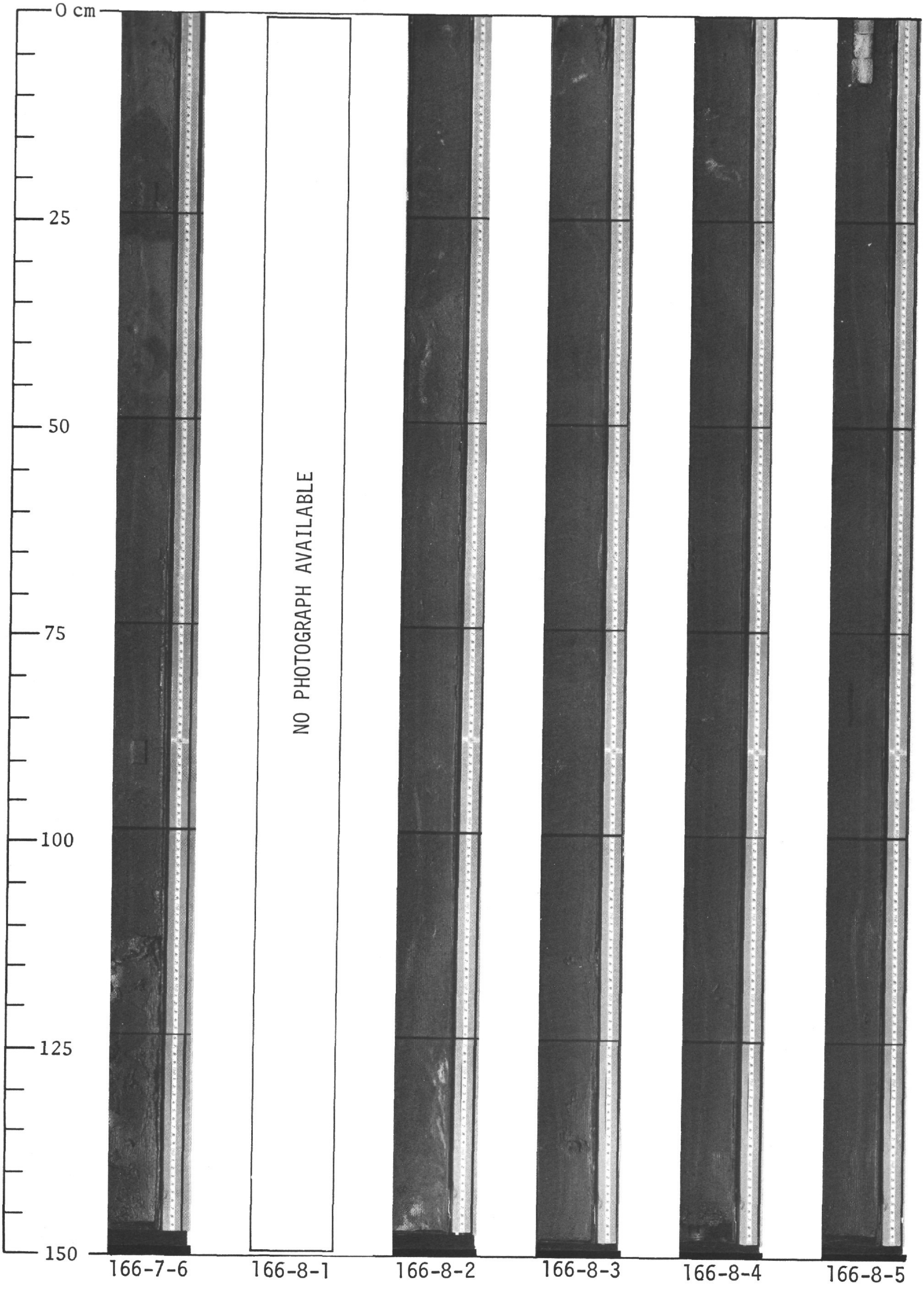
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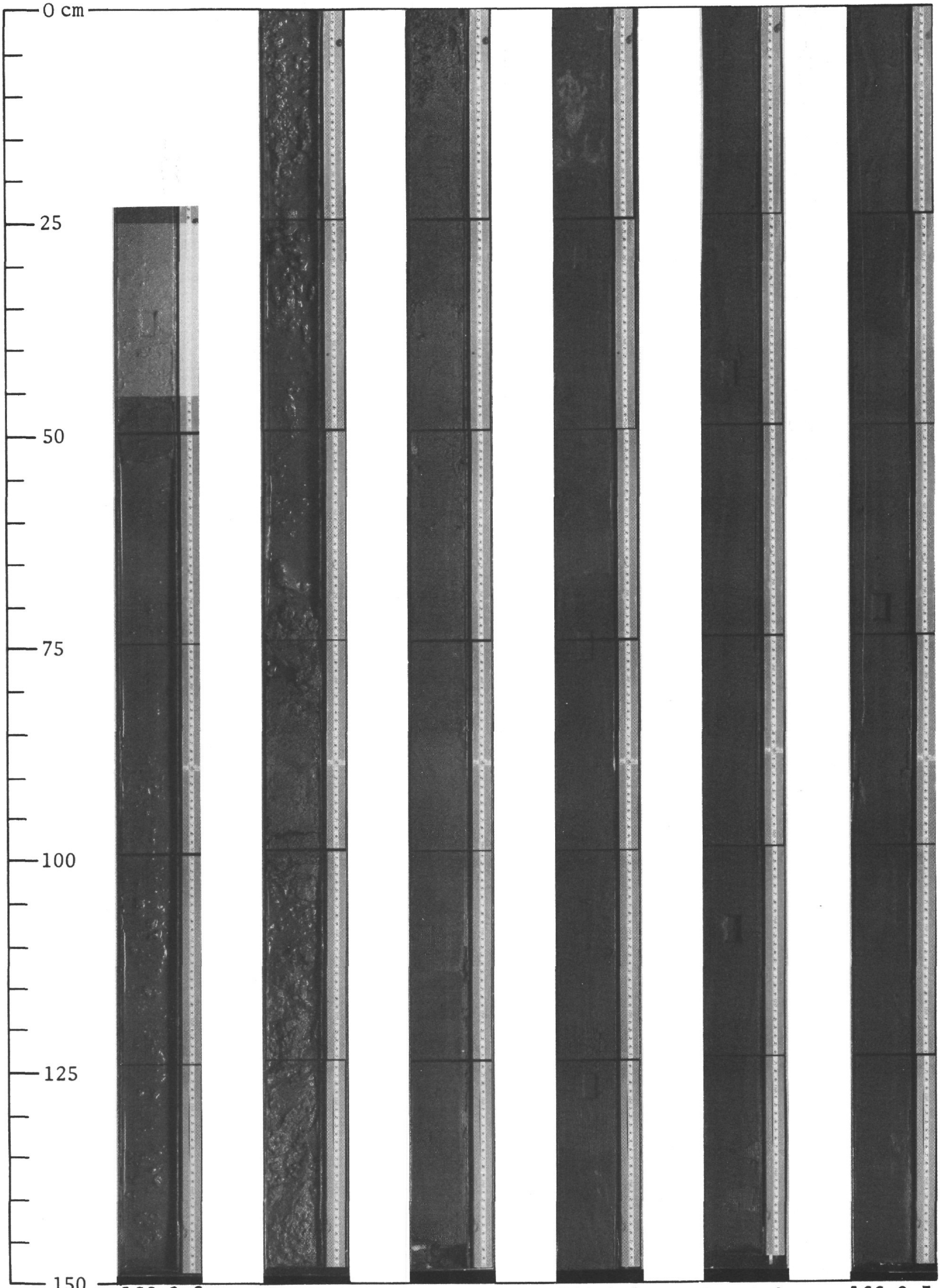
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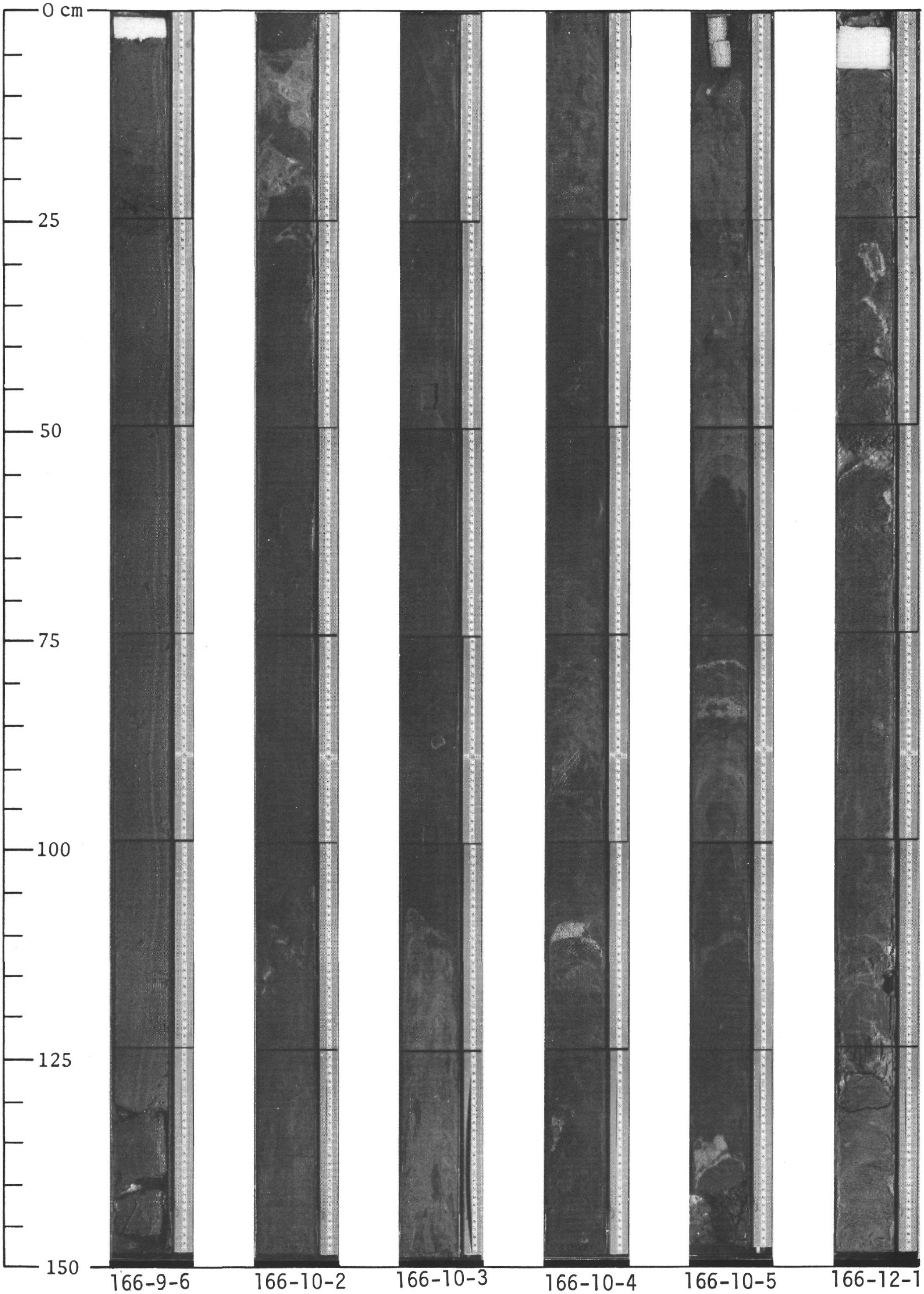
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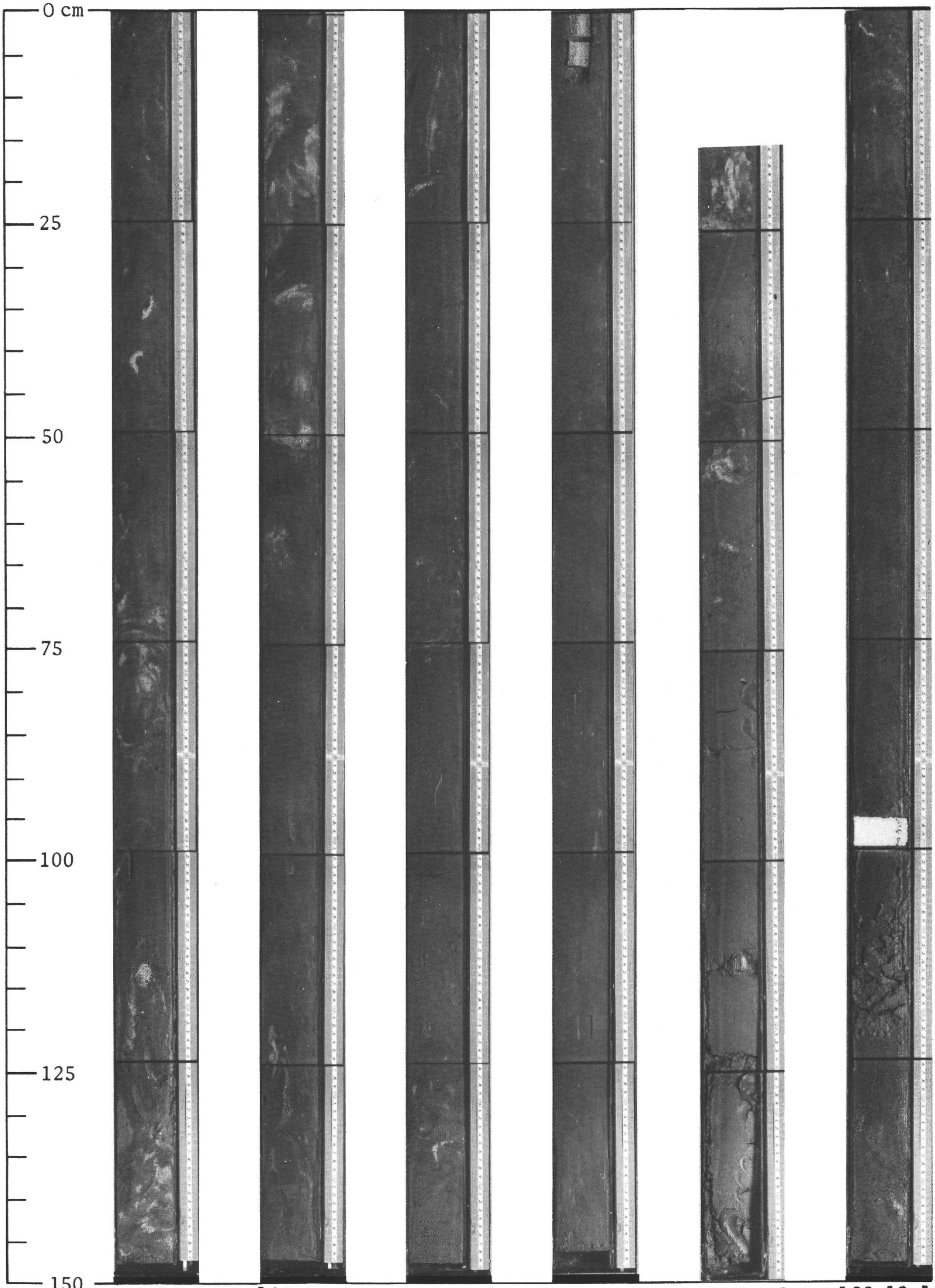
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166-12-5
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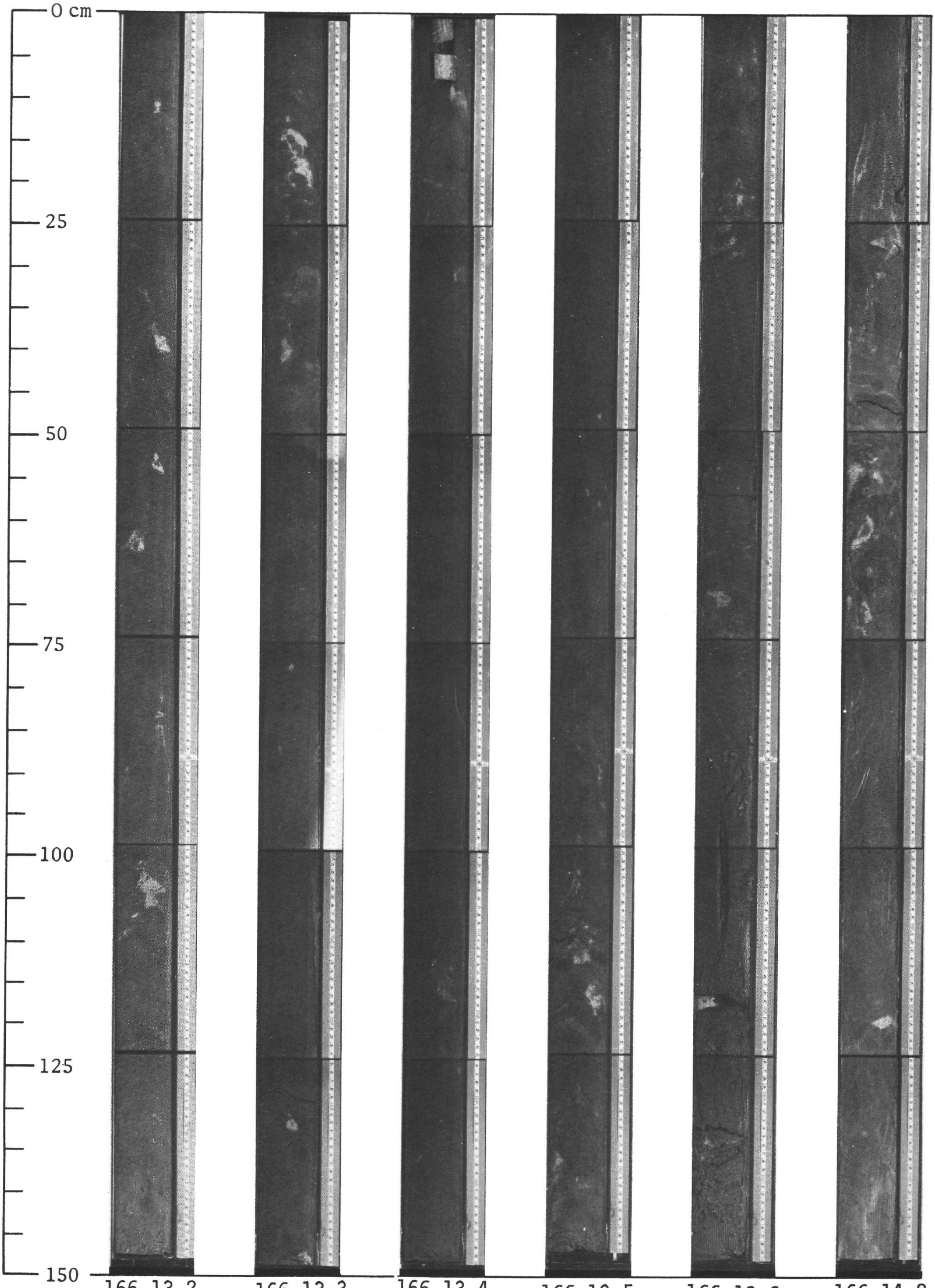
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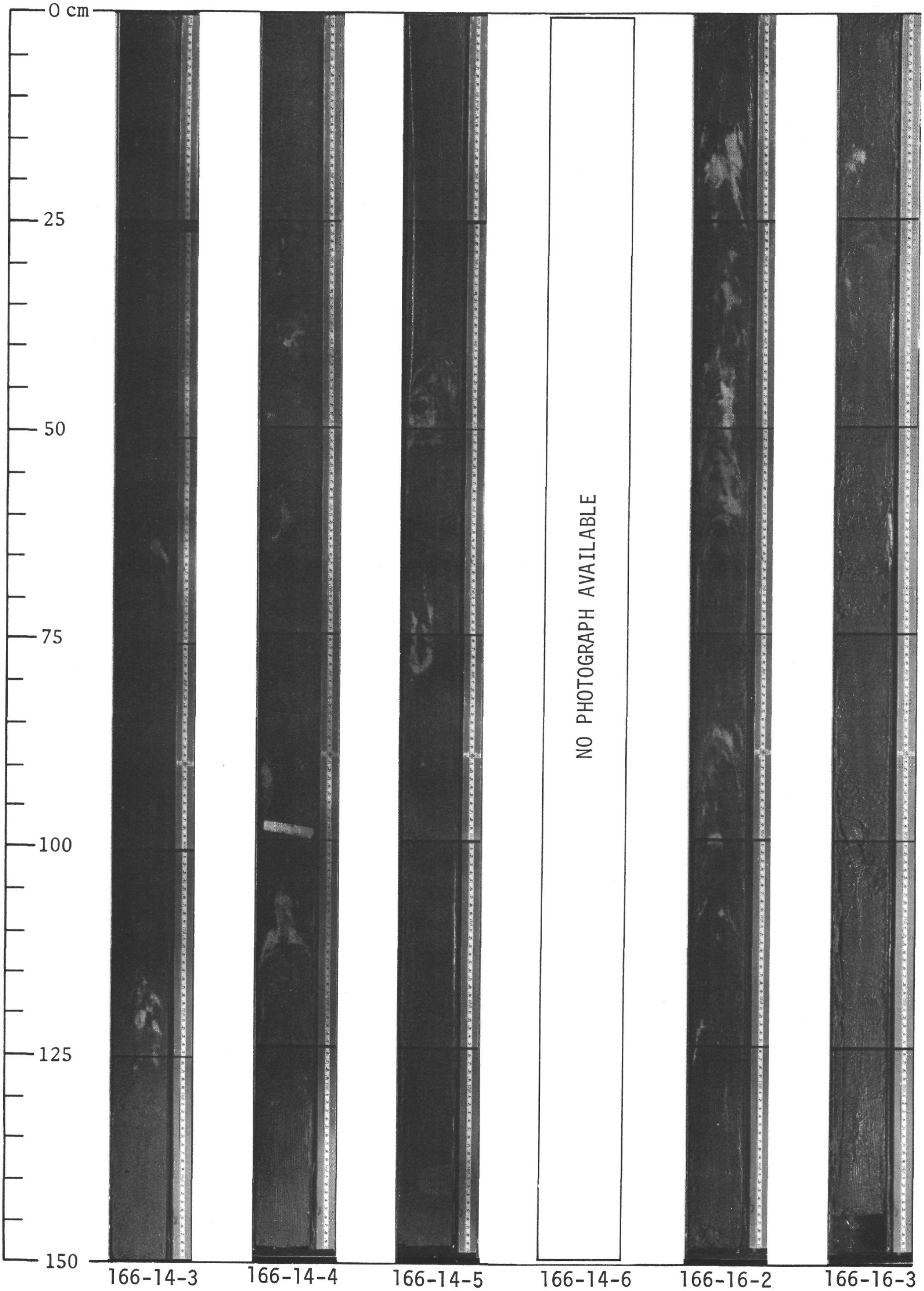
166-14-2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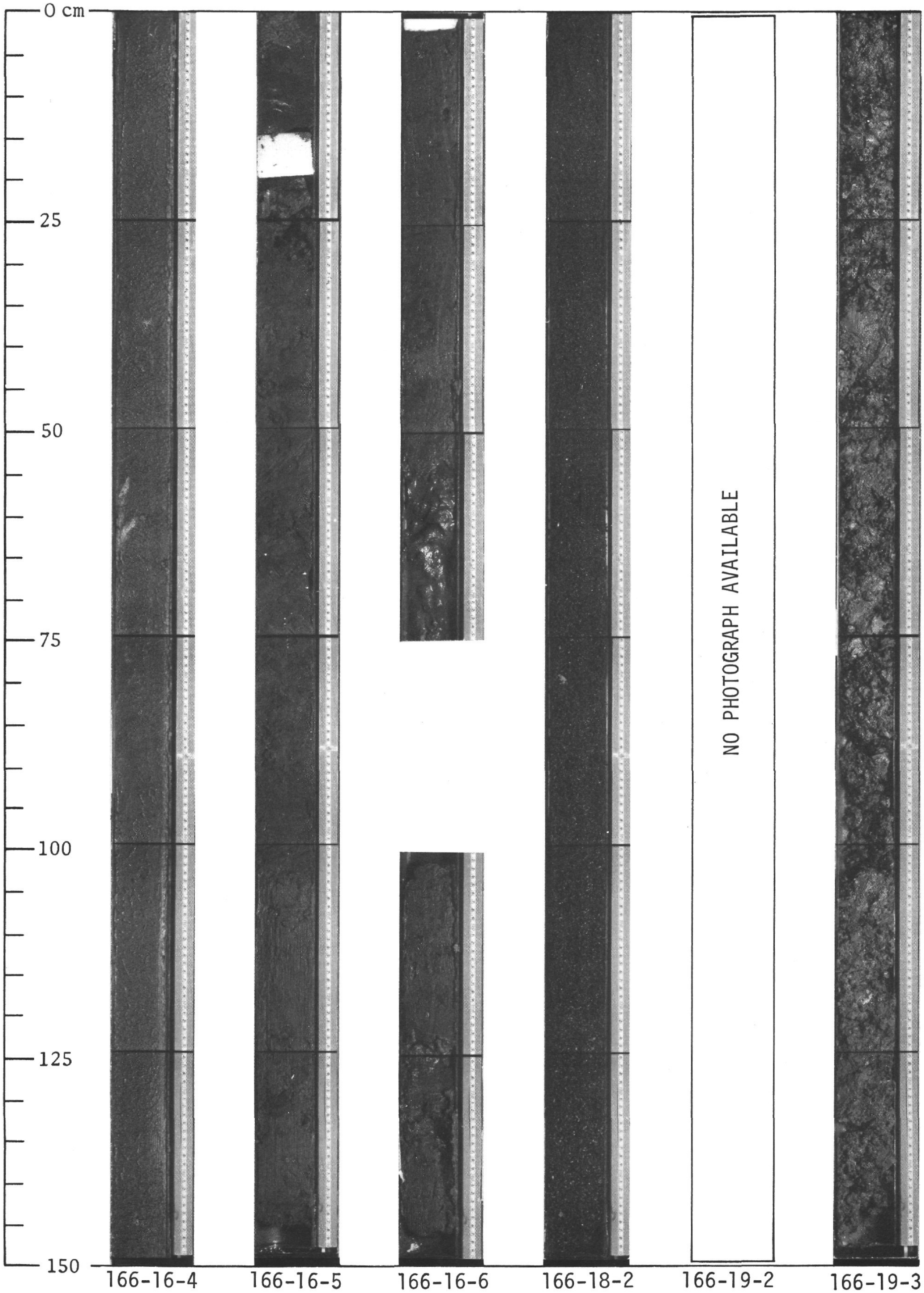
166-16-3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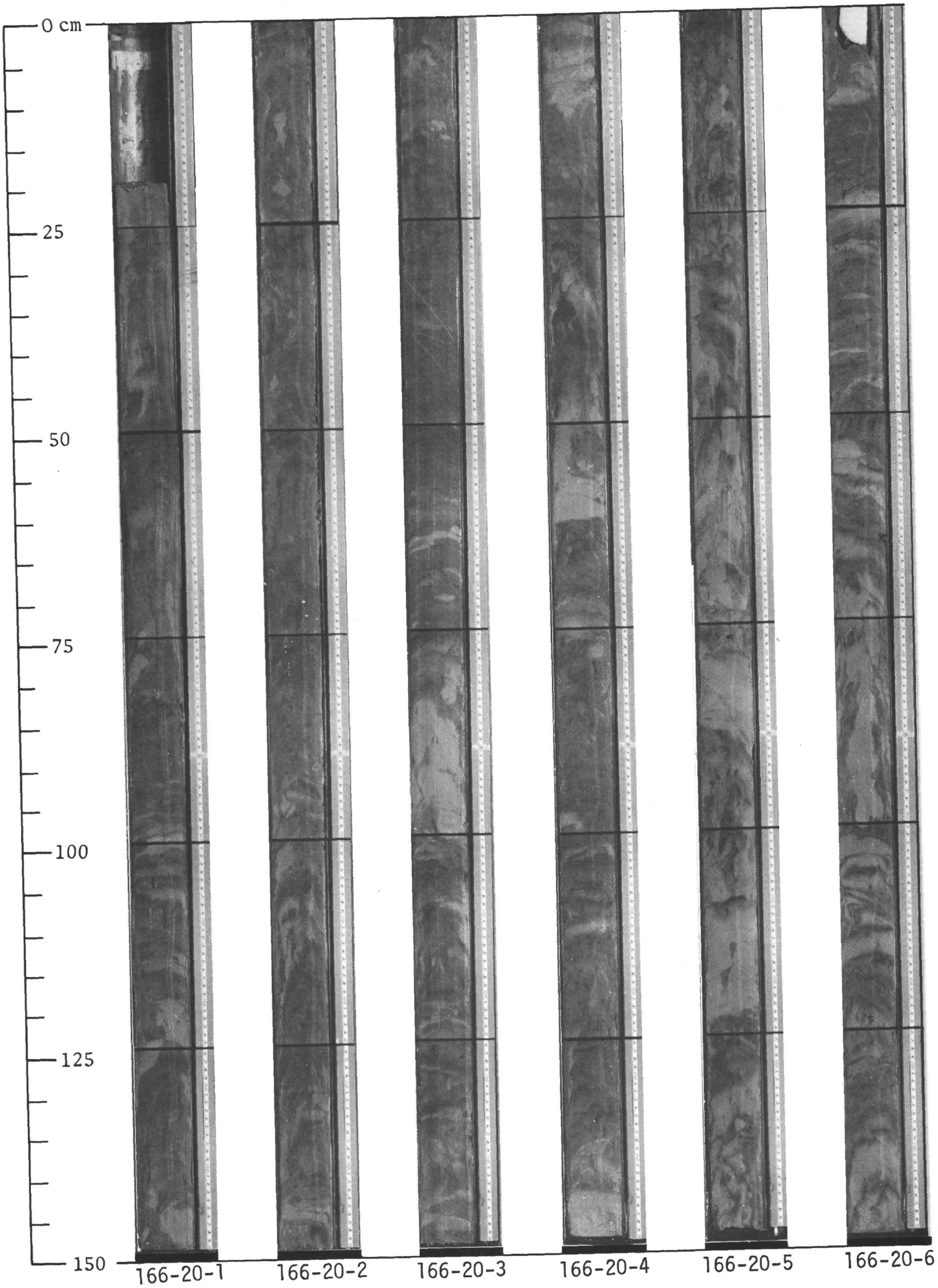
166-19-3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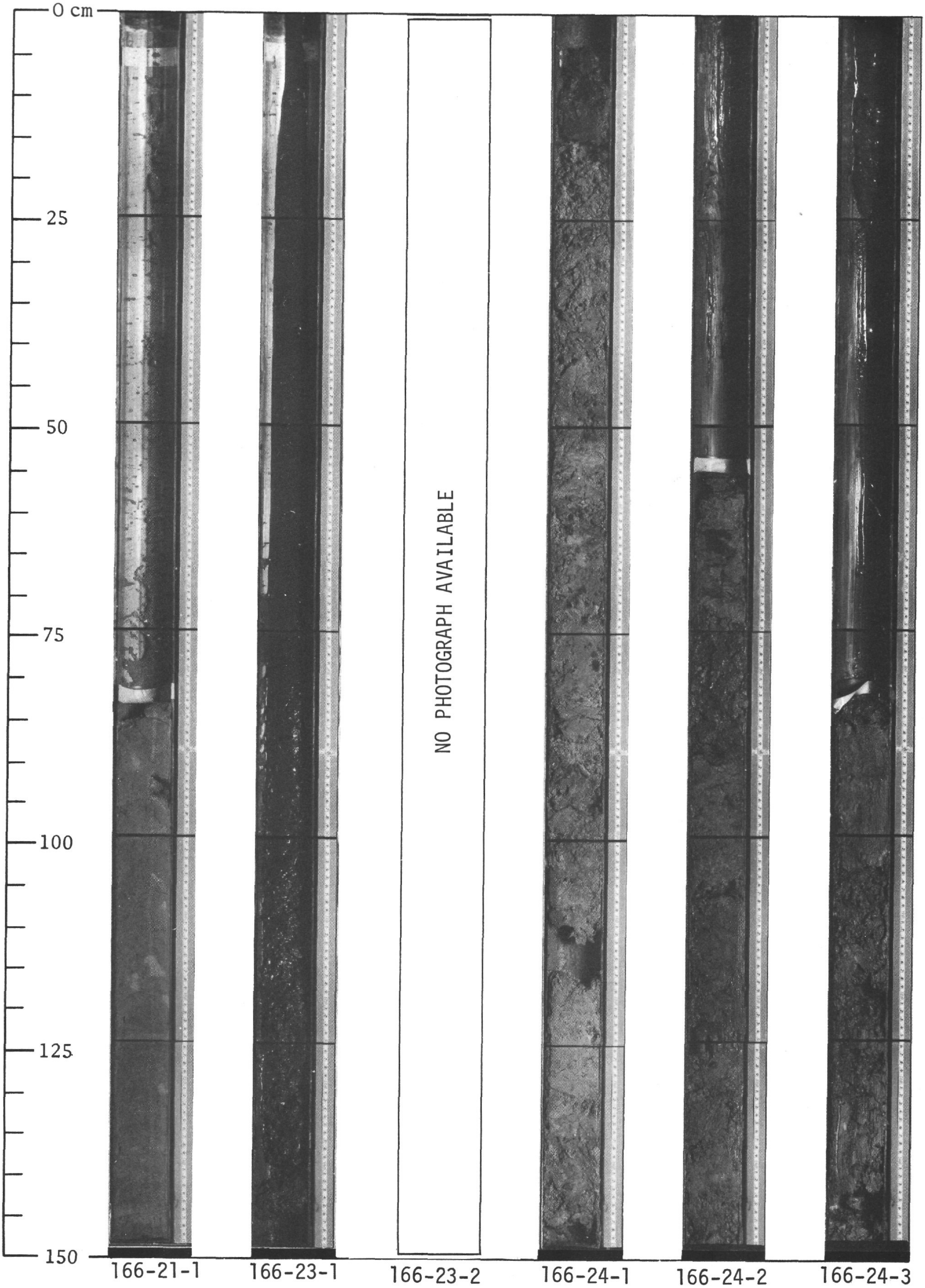
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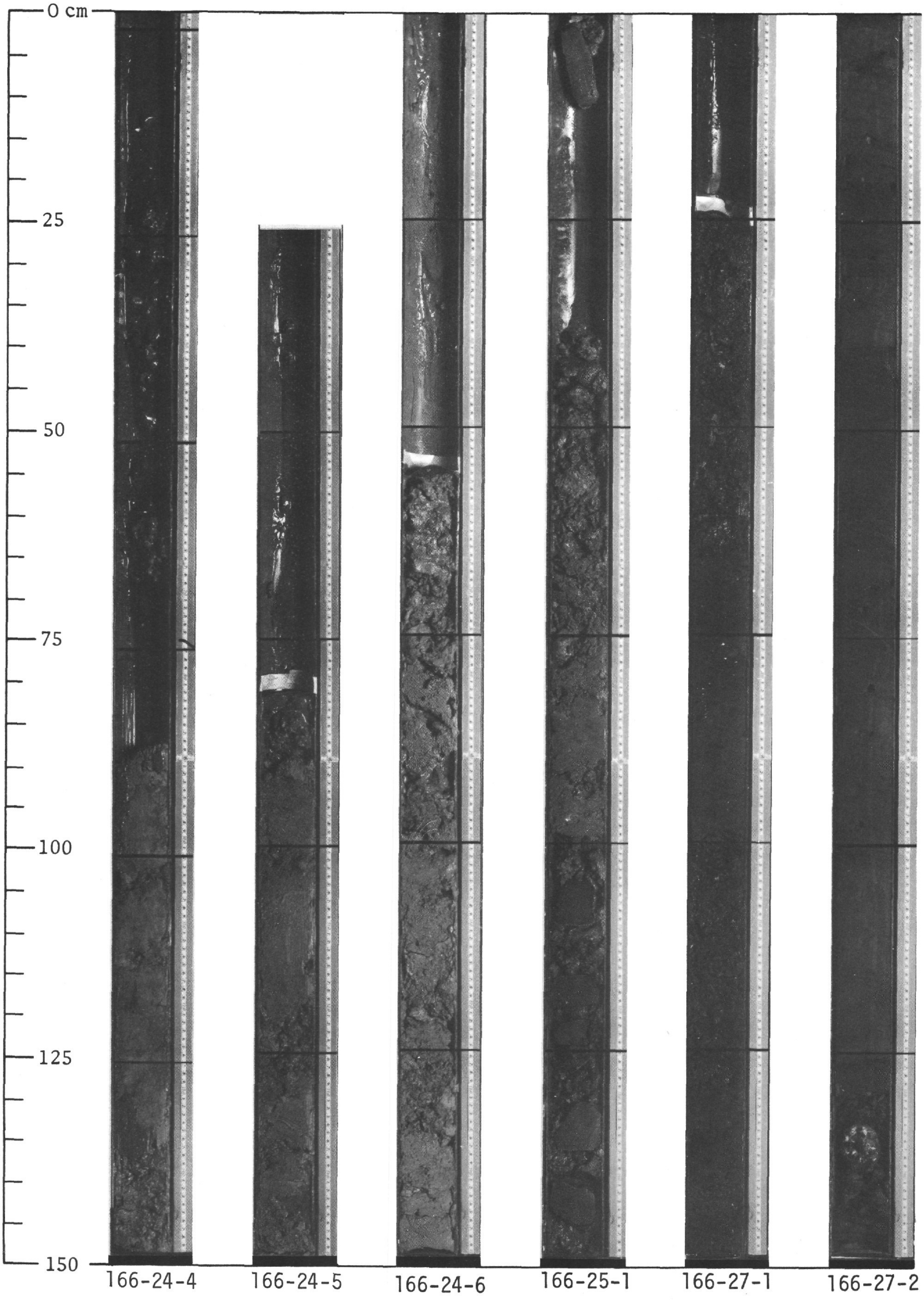
166-24-3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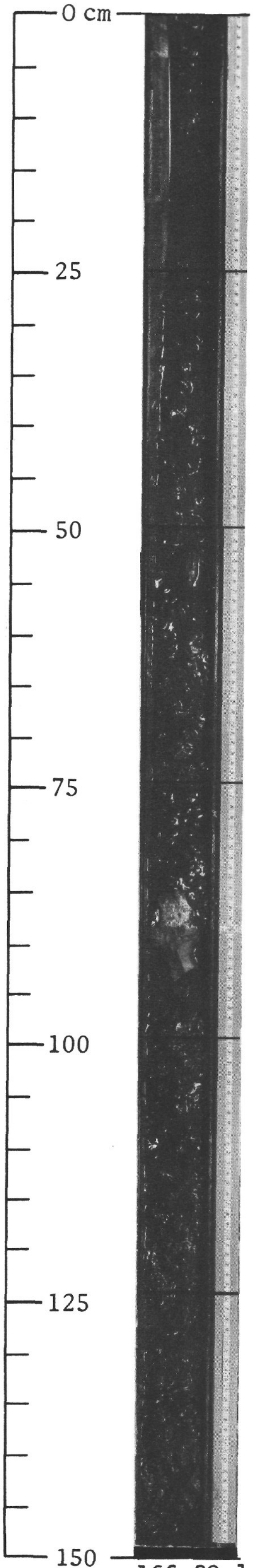
166-27-1
166-27-2



166-28-1

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166-28-2

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166A-1-1

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166A-1-3

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166A-1-4