6. SITE 268

The Shipboard Scientific Party[1]

SITE DATA

Date Occupied: 10 January 1973

Date Departed: 12 January 1973

Position: 63°56.99'S; 105°09.34'E

Water Depth: 3529 corrected meters (echo sounding)

Water Depth (adopted): 3544 meters (drill pipe from rig floor)

Total Penetration: 474.5 meters

Number of Cores: 20

Total Section Cored: 189.5 meters

Total Section Recovered: 65.6 meters

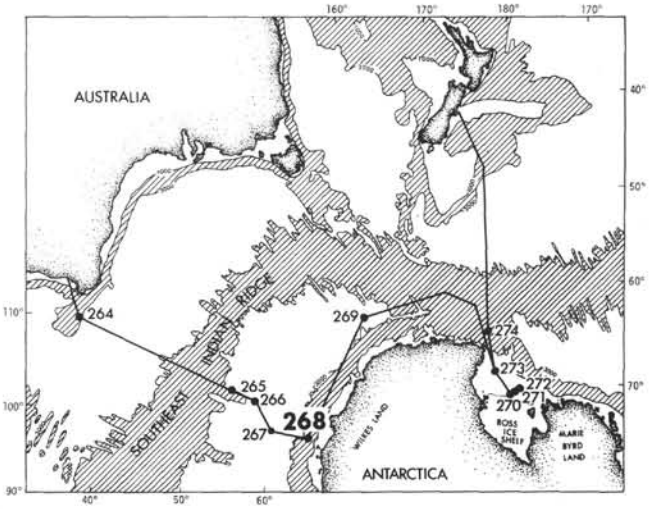
Percentage Core Recovery: 35%

Oldest Sediment Cored:
Depth below sea floor: 474.5 meters
Lithology: Clay and chert
Age: Middle Oligocene

Principal Results: Clayey sediments totaling about 474 meters thick and ranging in age from Quaternary to late Oligocene were cored at Site 268. Ice-rafted pebbles and granules are common well down into the lower Miocene part of the section, and isolated granules occur in the Oligocene sequence. Sediments in which chert has formed were deposited prior to the interval of abundant ice rafting—in the Oligocene and earliest Miocene. Thin sand and silt laminae found in the upper 150 meters probably represent turbidite deposition. Silty clays in the lower two-thirds of the section show few structural characteristics of turbidites and the dominant sedimentation process is inferred to have been related to deep ocean currents.

BACKGROUND

Site 268 is located on the lower continental rise just north of the Knox Coast of Antarctica (Figure 1) in a water depth of about 3500 meters. There have been no previous geophysical surveys at this site, although magnetics data acquired aboard *Glomar Challenger* enroute indicate that the underlying crust is older than anomaly 20 (50 m.y.). A magnetic quiet zone may underlie the site. The total sediment cover at this site is expected to exceed 1.5 km, if conditions here are similar to surveyed areas along the lower continental rise to the east. The *Challenger* seismic profile in the vicinity of Site 268 is shown in Figure 2.



The objectives at this site were to extend the reconnaissance profile of holes nearer shore in the hope of recovering terrigenous material bearing on the geologic history of this sector of Antarctica, and to generally examine glacial, sedimentological, and volcanic history of the adjacent continent. Several hours of presite seismic surveying were required to ensure the absence of potentially hazardous geological structures.

OPERATIONS

The area originally intended for Site 268 was briefly surveyed by *Glomar Challenger*. However, because of the presence of numerous icebergs, this area was abandoned. A new site some 30 miles to the southeast and relatively free of icebergs was surveyed. The site chosen was on the lower continental rise and on a gentle slope to the northwest. Several subbottom reflecting horizons were present.

Following completion of the survey (see Figure 3), the towed gear was retrieved and the ship reversed course and steamed back over the selected site using the PDR as a guide. The beacon was dropped at 1047 on 10 January in 3529 meters (PDR corrected) of water and positioning in the automatic mode was acquired by 1200 hr.

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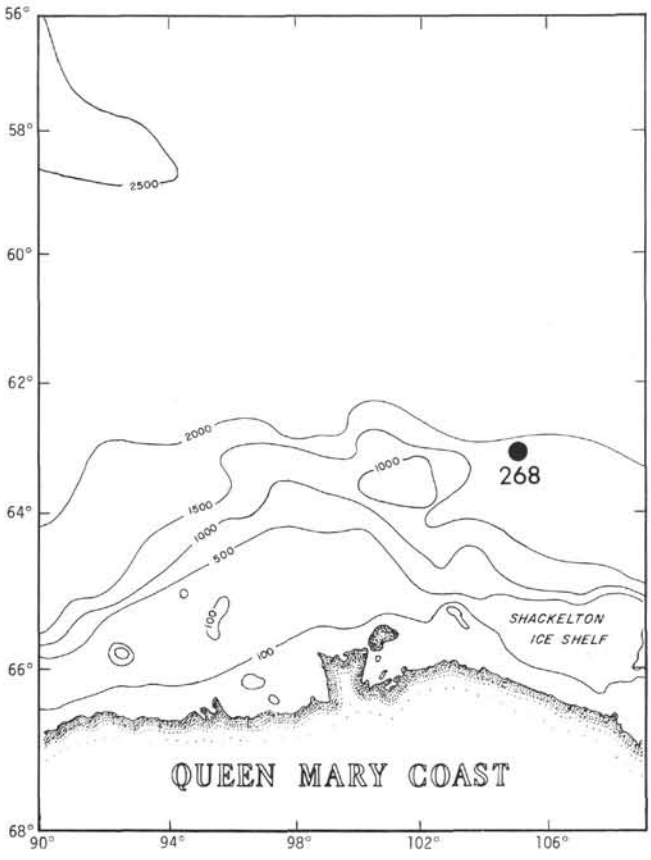


Figure 1. *Location of Site 268 and bathymetry. Contours in fathoms (corrected). Solid line is track line for* Glomar Challenger *seismic profile shown in Figure 2.*

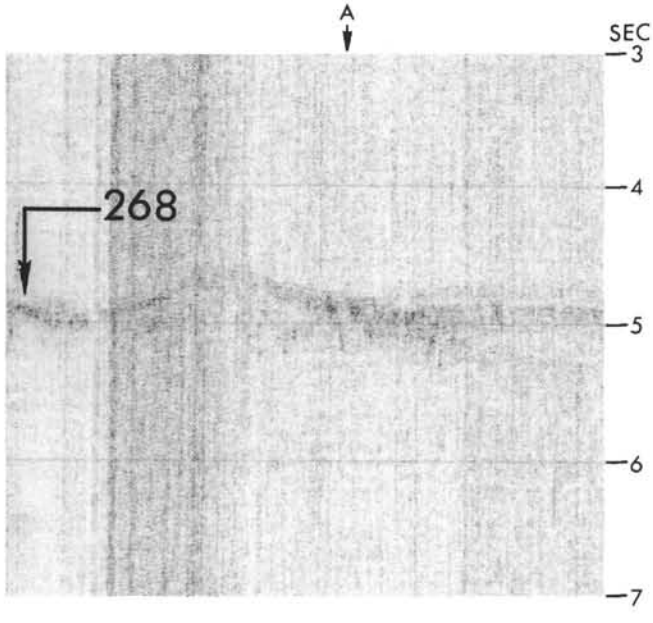


Figure 2. Glomar Challenger *acoustic reflection profile on approach to and departure from Site 268. Vertical scale is in seconds of two-way reflection time. The last portion of the approach profile (starting at point A) is the* Challenger *survey for Site 268, the detailed track of which is shown in Figure 3.*

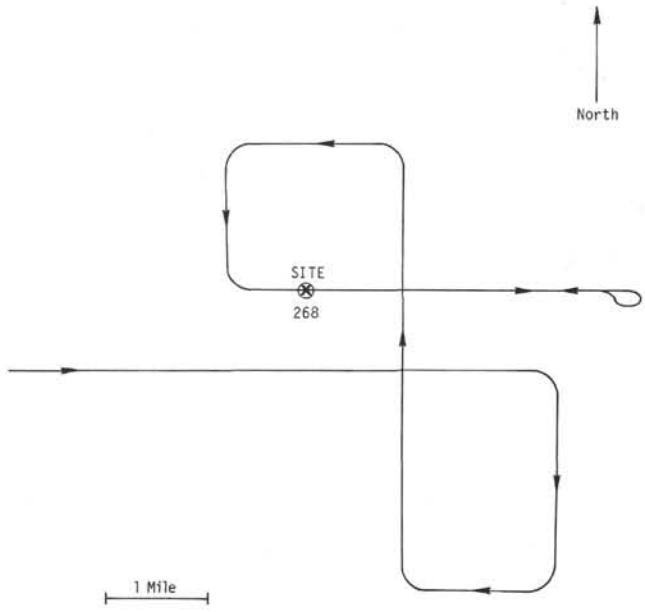


Figure 3. *Detailed dead-reckoning survey by* Glomar Challenger *for Site 268. Point A corresponds to beginning of survey and to point A on the seismic reflection profile in Figure 2.*

Hole 268 was spudded in at 2215 on 10 January and drilling with intermittent coring was carried out to a depth of 474.5 meters subbottom (Table 1).

No serious problems were encountered with either the drilling and coring operations or with the dynamic positioning system, although during the first several hours on site these operations were barely maintained because of rough seas and 35- to 40-knot winds.

The last core was brought onboard at 1120 on 12 January, the drill string and bottom-hole assembly were recovered and the ship got underway at 2155 12 January 1973.

LITHOLOGY

The sequence cored at this site has been divided into three units, shown in Table 2. Several criteria could have been selected in order to break up the section into units. An arbitrary choice was to use the first and last occurrence of nanno ooze to define the limits of Unit 2. Several other lithological characteristics change at or near the unit boundaries defined in this way.

Ice-rafted pebbles are common in Unit 1; some ice-rafted granules are found in Unit 2; in Unit 3, here are very rare pebbles and granules, which are possibly of ice-rafted origin. The lowest granules found are in Core 19.

Semilithified sediment was found at a shallower depth at this site than in previous sites in the Southeast Indian Ocean. This sediment was also noticeably fissile, probably because of the abundance of lamination. The sedimentology of this site is discussed in greater detail (Piper and Brisco, this volume).

Unit 1

Three main types of sediment are found in this unit. (1) Diatomaceous sediment, ranging from diatom ooze

TABLE 1
Coring Summary, Site 268

Core	Date (Jan. 1973)	Time	Depth From Drill Floor (m)	Depth Below Sea Floor (m)	Length Cored (m)	Length Recovered (m)	Recovery (%)
1	10	2355	3554.0-3563.0	0.0-9.0	9.0	8.9	98
2	11	0129	3582.0-3591.5	28.0-37.5	9.5	8.6	91
3	11	0310	3610.5-3620.0	56.5-66.0	9.5	2.4	25
4	11	0420	3639.0-3648.5	85.0-94.5	9.5	2.8	29
5	11	0542	3667.5-3677.0	113.5-123.0	9.5	2.7	28
6	11	0740	3688.5-3698.0	134.5-144.0	9.5	0.6	6
7	11	0930	3698.0-3707.5	144.0-153.5	9.5	1.8	19
8	11	1050	3724.5-3734.0	170.5-180.0	9.5	3.7	39
9	11	1208	3753.0-3762.5	199.0-208.5	9.5	7.2	76
10	11	1329	3781.5-3791.0	227.5-237.0	9.5	9.5	100
11	11	1500	3810.0-3819.5	256.0-265.5	9.5	0.3	3
12	11	1635	3838.5-3848.0	284.5-294.0	9.5	1.5	16
13	11	1851	3857.5-3867.0	303.5-313.0	9.5	0.6	6
14	11	2044	3876.5-3886.0	322.5-332.0	9.5	0.3	3
15	11	2235	3895.5-3905.0	341.5-351.0	9.5	0.9	9
16	12	0125	3905.0-3914.5	351.0-360.5	9.5	1.2	13
17	12	0345	3933.5-3943.0	379.5-389.0	9.5	3.3	35
18	12	0635	3962.0-3971.5	408.0-417.5	9.5	4.3	46
19	12	0920	3990.5-4000.0	436.5-446.0	9.5	3.0	32
20	12	1120	4019.0-4028.5	465.0-474.5	9.5	2.0	21
Total					189.5	65.6	35

TABLE 2
Lithologic Units, Site 268

Unit	Lithology	Subbottom Depth (m)	Unit Thickness (m)	Age
1	Clay, silty clay, sand, and diatom ooze	0-~160	~160	Pliocene to Quaternary
2	Clay, silty clay, and clay nanno ooze	~160-228	~68	Early Miocene
3	Silty clay, laminated silty clay and clayey silt, and chert	228->474.5	~256.5	Mid-Oligocene or older to early Miocene

to diatom-bearing silty clay. Colors are olive- or yellowish-gray (5Y6/4-10Y4/2-5Y4/1). Pebbles, granules, and coarse sand, presumably ice rafted, are common. (2) Clay, silty clay, and clayey silt, with brownish color (10YR4/2-5YR3/4-5YR4/1). Diatoms are present in trace amounts only. Ice-rafted granules and coarse sand are in places concentrated in thin beds, but rarely scattered. Ice-rafted pebbles are rare. Laminae of medium silt are common (average one every 5-10 cm). (3) Beds of fine sand and coarse silt generally 3-10 cm thick. These generally have sharp bases, and grade finer upwards into clayey silt, and are interpreted as turbidites.

These three sediment types appear uniformly distributed throughout the unit. Cores 6 and 7 recovered 70 cm of granite, gneiss, and gabbro in lengths of up to 28 cm. This is presumed to be from ice-rafted boulders. The sequence of cored lithologies suggests at least seven boulders. There is no evidence for the cause of such a concentration of boulders, but it may have resulted from an iceberg melting sufficiently for the remaining sediment laden ice to sink.

Unit 2

Three main sediment types are found in this unit. (1) Olive-gray silty clay and clay, some diatom bearing, with infrequent coarse sand, granules and pebbles, presumably of ice-rafted origin. (2) Olive-gray nanno clay and clay nanno ooze, some diatom bearing. Coarse sand is very rare and granules and pebbles are lacking. Forams are rare and are generally fragmentary. (3) Grayish-red and brown clay and silty clay. This lithology is best developed in the lower part of Core 9, where thin laminae of medium silt are common (one every 1-2 cm). The silt includes about 15% size-sorted diatoms, Radiolaria, and sponge spicules; in the silty clay, biogenous material is less concentrated (2%-5%).

Unit 3

This unit consists dominantly of silty clays and porcellaneous cherts, with minor amounts of partly chertified silty clay. The cherts appear to have formed by lithification of the silty clays, since all the variations in color and bedding structures in the silts can also be

found in the cherts. The two main lithological types are: (1) Dark yellowish-brown (10GR4/2) laminated silty clay and (clayey) silt, similar to that in Unit 2. Silt laminae are very abundant, sometimes several per centimeter. Silt-sized diatoms and Radiolaria are concentrated in the laminae. In Core 14 and below there is a similar lithology of a grayish-olive color (10Y4/2, also 5GY4/1). In places, silt laminae are less abundant (one per 2 cm), and in parts of Cores 19 and 20 are completely absent. Similar chertified lithologies, both laminated and unlaminated, are common. Small amounts of diatoms and radiolarians are found in the silty clays throughout the unit. (2) Grayish-red and brownish-gray silty clay, with no laminae, and similar chertified lithologies.

Because of limited recovery, general statements about the abundance of chert are difficult. There is no evidence for marked variation in abundance in different parts of Unit 3.

Rare granules and fine pebbles are found in the cherts. A 4-cm granite pebble in Core 14 may be evidence of ice rafting, but could be downhole contamination similar to that in Unit 4 of Site 274. A granule-sized clast was found in a grayish-red chert in Core 11, Section 1. A dark greenish-gray chert at 19-2, 78-81 contains a thin bed of sand and granules.

In Core 10 and many of the lower cores, occasional silt laminae have a dark color which extends about 1 mm into the surrounding silty clay. This is apparently diagenetic, and associated with an unidentified opaque mineral seen in smear slides to coat or replace biogenic silica. At 10-2, 137, small dark concretions of granule size have formed in such a lamina.

Silt laminae are generally planar. No cross-lamination has been seen. In the lower part of the unit, many silt laminae are discontinuous and lenticular. A silt lamina at 18-3, 40 shows apparent small load deformation. The biogenic component of the silt laminae is generally size sorted, but varies in abundance with the abundance of biogenic material in the interlaminated silty clay.

Core 13-1 contains a trace of nanno ooze. A grayish-red silty clay in 17-3 contains 1-mm flecks predominantly of carbonate, including some calcareous nannofossils. Occasional calcareous nannofossils are found in silty clays in Core 20.

At 18-3, 131-140, there are blocks of silty clay dipping at about 35° set in a slightly softer matrix. The sediment is stiff to semilithified. The occurrence may be due to either drilling deformation, or to synsedimentary slumping. The former interpretation is preferred. However, one chert bed at 15-1, 109 has microfaulting which apparently developed prior to chertification.

Petrology of Ice-rafted Debris

Numerous clasts of continental-type rocks occur to a subbottom depth of 440 meters in Hole 268. Most were doubtless deposited from melting icebergs calved from ice shelves and glacier tongues around Antarctica.

Visual inspection and probing of each split core section revealed a total of 105 clasts larger than about 1 cm. Most by far were in Unit 1. Much of the silt and sand fraction in the core is also likely to be of glacial origin.

Size, shape, and roundness measurements of the clasts are summarized in Chapters 22 and 23, this volume. Although the largest clasts in most clast-bearing intervals are between 3 and 6 cm long, much larger ones, up to at least 28 cm long, are present in Sections 6-1 and 7-1. The clasts are mostly equant to tabular, and with sphericities that range from 0.55 to 0.9. Mean roundness for the four core sections with 10 or more pebbles ranges from angular to subangular. The range in roundness is also small within each sample and only one or two very angular or rounded pebbles were found. Several subrounded pebbles appear to have been broken in half, probably during glacial transportation, but possibly during drilling.

The effects of glacial abrasion, implying transport at the base of a wet-base glacier, were seen clearly on only two clasts, both of which are gabbro. One has a flat face with fine parallel striae and the other a well-developed "keel" formed by abrasion as the pebble, held firmly in the basal ice of the glacier, was dragged through unconsolidated subglacial sediment. Several other clasts have indistinct striae or facets.

Clast lithologies were determined in hand specimens, and 20 of these were examined in thin section. Half of the clasts are granitic, and are typically fine- to coarse-grained, equigranular biotite-microcline granite with no prominent fabric, and biotite or biotite-hornblende granodiorite. A few are altered, like clast 5 of Section 5-1, which consists of extensively sericitized plagioclase, quartz, and elongate patches of chlorite, probably replacing biotite. Another (1, CC, 1) shows clear evidence of cataclastic deformation and mineralization. The rock consists of about 20% quartz with strongly undulose extinction and orthoclase and sericitize plagioclase in equal proportions. Quartz occurs as large, noncomposite or complexly sutured crystals a millimeter across, and as aggregates of fine crystals 50 μm across ("wreaths of mortar") forming a matrix for the larger crystals. A gray metallic mineral, possibly galena, occurs in several veins up to 0.2 mm wide in this pebble. Two other pebbles (1, CC, 5 and 18) have traces of fine-grained brassy sulfides.

Mafic plutonic rocks, which make up 9% of the total, are mainly unaltered fine- to medium-grained clinopyroxene gabbros, but include a sericitized hornblende gabbro (5-2, 1) and two probable diorites. In most of the gabbros the crystals appear randomly oriented, but in 7-1, 4 and 7-2, 1 apparent long axes of plagioclase laths are closely aligned, suggesting derivation from a layered-cumulate mafic intrusion. Both samples are strongly magnetic and carry about 10% of disseminated magnetite blebs about 100 μm across.

The metamorphic rock types comprise mainly regionally metamorphosed granitic gneiss, and quartzofeldspathic and mafic schists. The gneisses are composed mainly of quartz, oligoclase, and microcline with minor brown biotite and a little chlorite. The mafic schists consist almost entirely of green hornblende. A pebble from 5, CC (9) consists mainly of sericite (pinnite)-flecked cordierite crystals a millimeter across, with scattered quartz and patches of fine-grained chlorite and epidote. Most crystals show the pseudohex-

agonal twinning which is characteristic of cordierite. The rock probably resulted from thermal metamorphism of a pelitic sequence.

The sedimentary rocks include several lithologies. The most common clasts are very quartzose, well-sorted, fine- to medium-grained sandstones with well-rounded grains in a quartz cement. They are very much like the Devonian orthoquartzites of the Beacon Supergroup of the Transantarctic Mountains. A second lithology is hematite-cemented quartzose sandstone with grains ranging from angular to rounded. This sandstone is medium grained and moderately sorted and was probably derived from a "red-bed" sequence. The third lithology is represented by two pebbles (5-2, 3 and 4) of greenish-gray semilithified claystone with about 10% silty quartz. A smear slide of 4 shows scattered sponge spicules, diatom fragments, and well-preserved wood fragments. The lithology and degree of lithification are comparable with lower Miocene strata in Holes 268 and 269. There are also three pebbles of very light gray indurated siltstone, probably from the same, or a similar, sequence to that from which the quartz-cemented sandstones were derived.

Two volcanic pebbles were recovered. The basalt (5-22, 14) has a few scattered phenocrysts of plagioclase and clinopyroxene set in a groundmass of semiopaque devitrified glass with flow-aligned plagioclase microlites and microphenocrysts (An_{70}). A few microphenocrysts of clinopyroxene are also present. Sample 5-2, 10 is a lava of intermediate composition with a strongly developed trachytic texture and without visible mafic minerals. Most of the plagioclase microlites have parallel extinction, indicating a composition of about An_{20}. Phenocrysts are about An_{35}. The thin section also shows scattered patches of chlorite and epidote and an area 1.55 mm across of finely crystalline quartz.

Other pebbles include three of vein quartz and several fine-grained pebbles that have not been identified.

Provenance

The scattered distribution of the clasts in the sediments, the variety of lithologies, and the glacial features of two of the pebbles, in fine-grained deep-sea strata, provide compelling evidence for transport by ice rafting from a continental landmass.

The relative abundance of clasts more than a centimeter across at this site and their absence about the same latitude at Site 269, 1200 km to the west, points to a strong local influence in the quantity of glacial debris deposited in this sector of the Subantarctic oceans. However, the presence of gabbros, possibly from a layered intrusion, of "red beds," and of orthoquartzites suggests that the rocks were derived from an area larger than the adjacent 30° sector of the continent, where such rocks are not known. Charnockitic rocks, which are common along the Wilkes Land coast, are inexplicably absent in the ice-rafted debris in this hole.

Interpretation

In contrast to the sites to the north, calcareous sediments are restricted to the early Miocene, and the lower part of the core has cherts and diatom-bearing sediments. The site is on the continental rise, and has received much sediment from the continent. Many of the laminae in Unit 3 appear the result of contour currents; in contrast, Unit 1 is dominated by turbidites.

PHYSICAL PROPERTIES

Wet-bulk density measurements using the GRAPE technique were obtained on one or more sections from each of Cores 1-10, 17, and 19 at this site. Several additional determinations of wet-bulk density and porosity were obtained from the syringe samples. Sonic-velocity measurements were made on nearly all cores. Representative data are plotted in Figure 6. The sonic-velocity determinations for Cores 1-10 were made on the unsplit, lined cores while those for 11-20 were made on chunks of sediment.

With a couple of notable exceptions, sonic velocity increases regularly with depth at a rate of about 50 m/sec per 100 meters of depth. Wet-bulk densities are extremely variable within single cores, sections of cores, and from core to core. Based on the preliminary lithologic descriptions, most of these variations can be accounted for by changes in the relative proportions of sand, silt, clay, chert, and biogenous components. A good example of this is found in Core 10, Section 1, which contains a clay nanno ooze (ρB = 1.60 to 1.70 g/cc), silty clay (ρB = 1.55 to 1.70 g/cc), and clayey silt (ρB = 1.70 to 1.80 g/cc).

Several very sharp changes occur in the physical properties of the sediments cored. Figure 4 shows the variation of sonic velocity, wet-bulk density, and acoustic impedance with depth. The peak in acoustic impedance at about 30 meters subbottom is caused by a sand layer (ca 30 cm thick) and correlates well with an acoustic reflector at about 0.04-0.05 sec two-way travel time which appears both on the profiler and sonobuoy records. Also, the very large change in physical properties at 115 to 140 meters subbottom is correlatable with a reflector at 0.13 to 0.14 sec.

Sonic-velocity measurements on chunks of semilithified and laminated clay and siltstone in several of the cores below Core 11 showed anisotropy, with velocities measured parallel to the bedding generally being 5% to 10% greater than velocities measured normal to the bedding.

Shipboard determinations of alkalinity, *p*H, and salinity are shown in Figure 5. Alkalinity values are quite high (3.91-6.16 meq/kg), except for the determination from deepest in the hole (2.1 meq/kg in Core 17). Salinity and *p*H show little variation, except for a low value of salinity corresponding to the low alkalinity in Core 17.

BIOSTRATIGRAPHIC SUMMARY

A largely detrital section of undetermined age at the base to Recent at the top was recovered at Site 268. The lowest dated core is Core 17 for which nannofossils and foraminifera indicate a probable late Oligocene age. The section is, in general, sparsely fossiliferous and preservation of calcareous as well as siliceous fossils is poor throughout. Foraminifera are present only in Cores 1, 8, 12, and 17 and as previous Antarctic sites, diversity is limited to one or two species in any assemblage. Nannofossils occur only in Cores 8-11 and 17-20 and are,

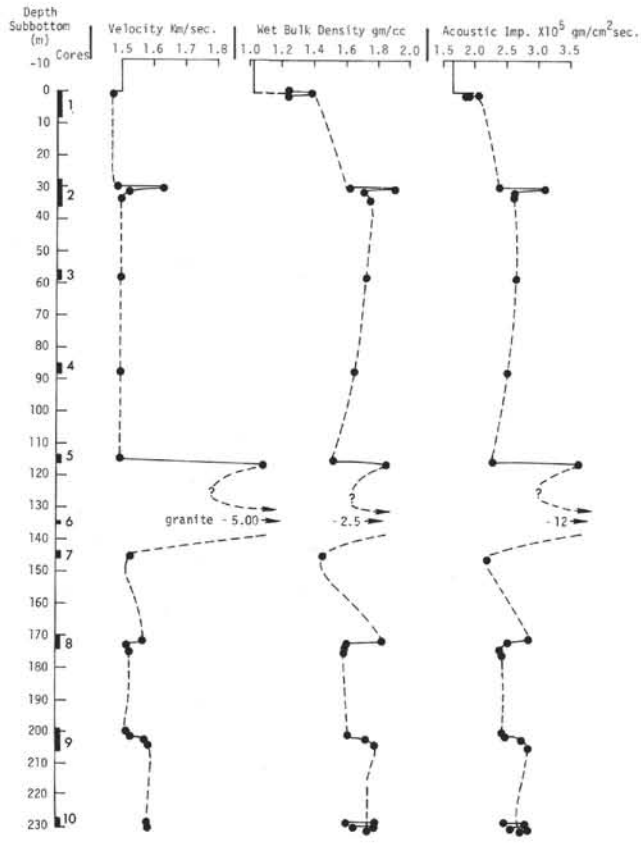


Figure 4. *Shipboard measurements of sonic velocity and wet bulk density at Site 268. Calculated acoustic impedance is shown.*

likewise, of very limited diversity and poor preservation. Datable radiolarian assemblages occur in Cores 1, 4, and 5; in the remainder of the section radiolarians are absent or so poorly preserved that age determinations are impossible. Diatoms are scarce and generally occur as fragments; they are absent below Core 12. Unequivocal age determinations were possible only for Cores 1, 2, and 5. Poor assemblages of Miocene diatoms occur in Cores 4 through 12.

Based on combined data from the various fossil groups the probable distribution of ages for cores at Site 268 is as follows. Cores 1, 2: late Pleistocene to Recent; Core 3: early Pleistocene(?); Core 4: Pliocene; Core 5: late Miocene or early Pliocene; Cores 6, 7: late-mid Miocene?; Cores 8-16: early Miocene to late Oligocene; Core 17: late Oligocene; Cores 18-20: unknown.

Foraminifera

Except for occurrences in four cores, the section at Site 268 is barren of foraminifera. Core 1 contains a fauna consisting entirely of left-coiling *Globorotalia pachyderma*, and belongs in the *G. pachyderma* assemblage zone of late Miocene to Recent age (see report for Site 266). The core catcher of this core contains frequent specimens of this species along with abundant ice-rafted sand- to pebble-sized material. A sample from Section 6, 82 cm is virtually a *G. pachyderma* ooze, containing very little other material.

The other occurrences of foraminifera at Site 268 are in Cores 8, 12, and 17; these belong in the *Catapsydrax unicavus* assemblage zone of late Oligocene/early Miocene age. In Core 8 *Catapsydrax dissimilis* is also present.

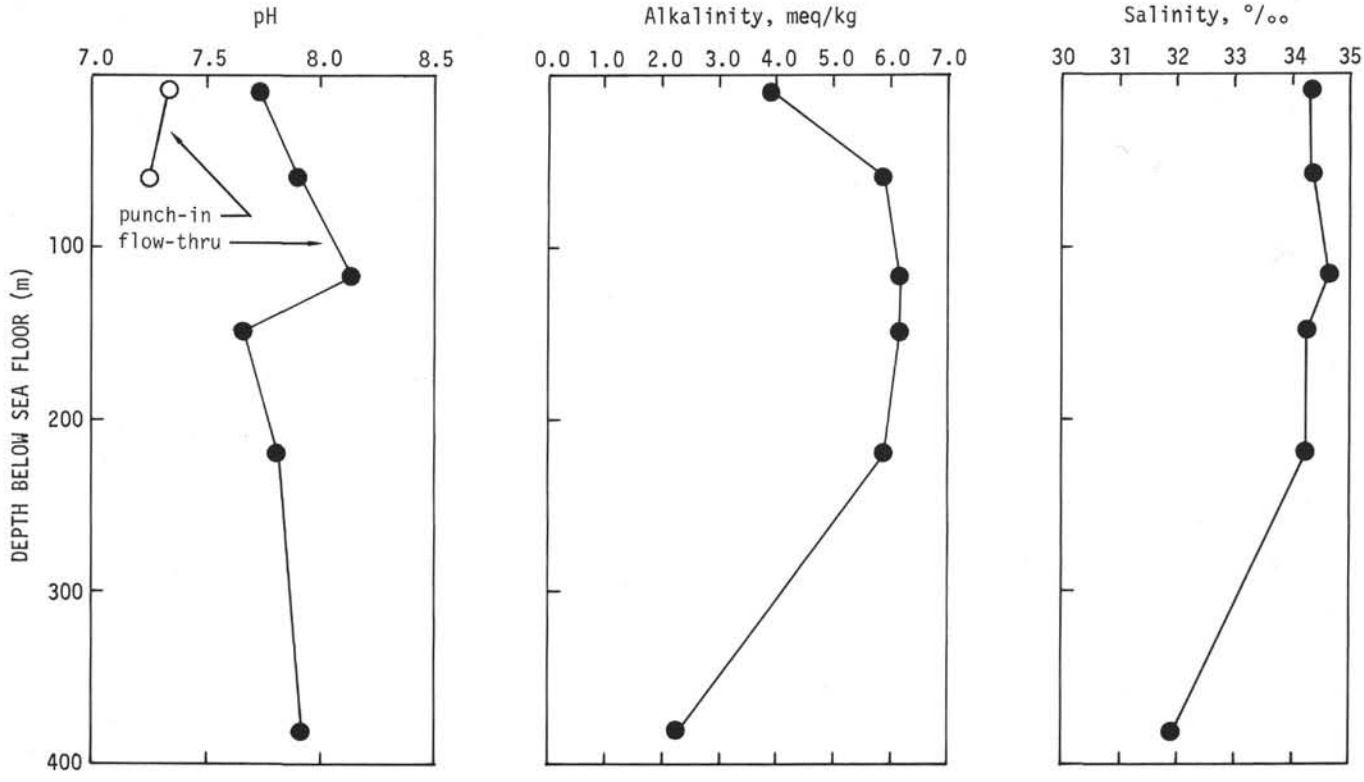


Figure 5. *Shipboard measurements of* pH, *alkalinity, and salinity in sediment pore waters at Site 268.*

As at previous Antarctic sites, the lack of diversity of the foraminiferal assemblages indicates deposition in a high-latitude environment. Moreover, despite its relatively shallow depth, Site 268 has been below the carbonate compensation depth for practically all of late Oligocene/early Miocene to Recent time.

Nannofossils

A 474-meter section of siliceous oozes and cherts (Cores 1 to 20) was sampled at Site 268. Within the siliceous oozes there were a few calcareous horizons which contained nannofossil assemblages (Sample 10-1, 10 cm; Core 13-1; Core 17-1-top; Samples 17-2, 129 cm to 17-3, 9 cm). These assemblages were generally poorly preserved. Occasional good nannofossil specimens allowed species identification to be made, but single shields and separated centers of placoliths were common. Species present include: *Coccolithus miopelagicus*, small *Reticulofenestra* sp., *Discoaster deflandrei*, *Cyclicargolithus floridanus*, *Coccolithus eopelagicus*, *Reticulofenestra umbilica*, *Dictyococcites abisecta*, *D. bisecta*, *Chiastomolithus altus*, *Dictyococcites scrippsae*, *Reticulofenestra* cf. *gartneri*, *Sphenolithus moriformis*, *Coccolithus pelagicus*, *Reticulofenestra hillae*.

The low abundance of nannofossils in the assemblages and their generally poor preservation made it impossible to give accurate age designations for the calcareous horizons. However, some biostratigraphic approximations can be given as follows. Mid to early Miocene: Core 10-1-top to Sample 10-1, 10 cm; early Miocene: Core 13-1; mid Oligocene: Core 17-1-top; mid Oligocene: Sample 17-2, 130 cm and Sample 17-2, CC; lower Oligocene: Core 17-3, 9 cm.

Radiolaria

Radiolaria are rare and moderately to poorly preserved in most of the Neogene sediments (Cores 1 to 12), and trace to absent in older sediments.

The only radiolarian zone recognized is the *Helotholus vema* Zone (Core 3, Section 2 to Core 7). The overall assemblages in Cores 8 to 13 indicate Miocene age, and further subdivision of this interval into zones is impossible. From Core 14 downward, sediments are barren of Radiolaria except at Core 17, Section 1 where only *Stylosphaera coronata coronata* is observed.

Diatoms

Diatoms are typically in very poor abundance and condition. When diatom remains are found they are fragmented. Very few entire frustules were found from Cores 1 through 12. Below Core 12 diatoms are absent.

Core 1 through Sample 2, CC contain the *Coscinodiscus lentigenosus* Zone along with a few reworked Oligocene diatoms. Only at Sample 2-1, 60 cm were there enough diatoms to give assurance to this assignment. In Cores 3 and 4 there were too few identifiable diatoms to make an assignment. Cores 5, 6, and 7 contain a portion of the *Denticula hustedtii* Zone. Cores 8 through 12 and below show such paucity of diatoms that they cannot be zoned.

Palynology

Eight samples, taken from all three lithological units, were macerated to recover palynomorphs from this site. Sampling was concentrated in the basal part of Unit 3, in the hope of establishing the age of the oldest part of the sequence penetrated. However, none of the samples yielded diagnostic fossils.

Core 20 yielded abundant acritarchs, chiefly leiospheres, which are not diagnostic as to age. A few pollen grains referable to the Late Cretaceous-Tertiary genus *Nothofagidites* are present, and recycled Permian pollens were notably common. *Nothofagidites* spp., and *Proteacidites* spp., another Cretaceous-Tertiary from genus, occur in Cores 16-19. Cores from the upper units, i.e., Cores 7, 8, and 9 were barren of identifiable palynomorphs, probably due to extreme dilution with terrigenous material.

SUMMARY AND CONCLUSIONS

Site 268 is the southernmost comprising the transect between the ridge crest and the Antarctic continent and along 105°-110°E longitude. The site is located on the lower continental rise off the Knox Coast in a water depth of 3544 meters. Sediments here are probably more than 1.5 km thick, but only 474.5 meters were penetrated during drilling. Sediments throughout the hole are chiefly silty clays, diatom-rich near the top and nannofossil-rich at lower levels, while chert is common in the lower 200 meters of the drilled section. Ice-rafted detritus is common down to the early Miocene portion of the section and isolated granules are found in the Oligocene sediments.

A few strata identifiable as turbidites occur in the form of thin sand units and silt laminae near the top of the sequence but below Core 7 silt laminae more closely resemble deposits from contour currents (Piper and Brisco, this volume). Thus, turbidity currents apparently did not reach this site before the Pliocene and then not in substantial quantities; contour currents apparently deposited a considerable amount of the silty sediment before the Pliocene. As in the pelagic sites on Leg 28, nannofossil sediments underlie diatomaceous ones at Site 268, but these possibly represent the upper part of a thick transition zone since nannofossils are present in only sparse amounts in the cherty sequence at the bottom of the hole (below Core 11). The highest level at which calcareous nannofossils are abundant is in the early Miocene (Core 8), within the time span representing the similar lithologic change at Site 267 (late Oligocene-early Miocene).

A prominent unconformity occurs between Pliocene (Gilbert) sediments in Core 7 and early Miocene ones in Core 8; throughout this interval the sedimentation rate averages to ~2 m/m.y. Diatomaceous clays above this break accumulated at ~31 m/m.y. and nannofossil-bearing clays below it at ~41 m/m.y. Extrapolation of the sedimentation rate observed between Cores 14 and 17 yields an age of early Oligocene for the oldest sediments penetrated at the site.

Magnetic lineation studies suggest that the underlying crust at Site 268 is about 55 m.y. old. If correct, this implies a very high average sedimentation rate of 60-70 m/m.y. for the lower 1000 meters of unsampled sediments at this site. This area has presumably undergone major vertical tectonism associated with the early rifting of Antarctica and accompanied by large-scale terrigenous sedimentation.

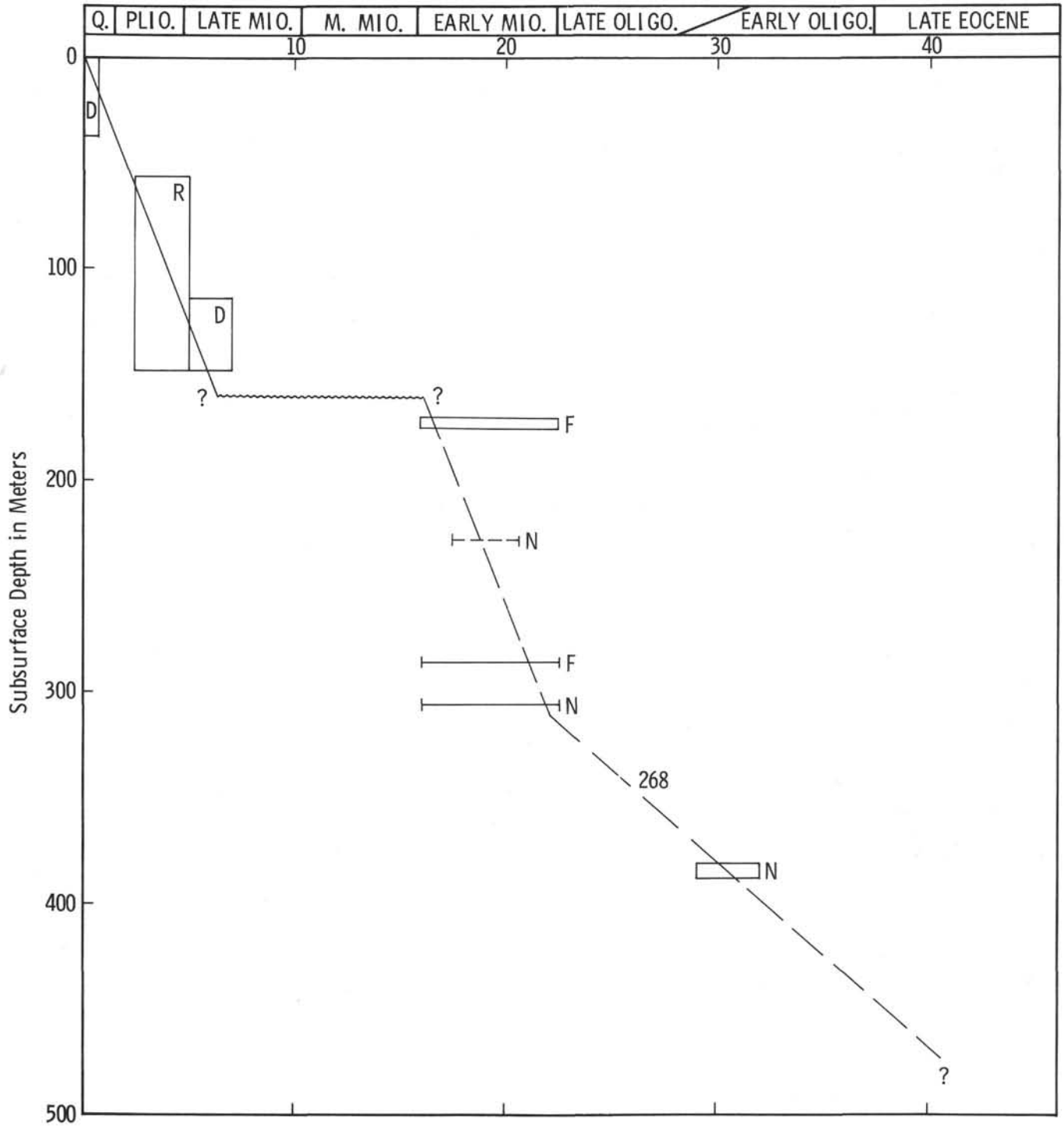


Figure 6. *Age vs. depth at Site 268.*

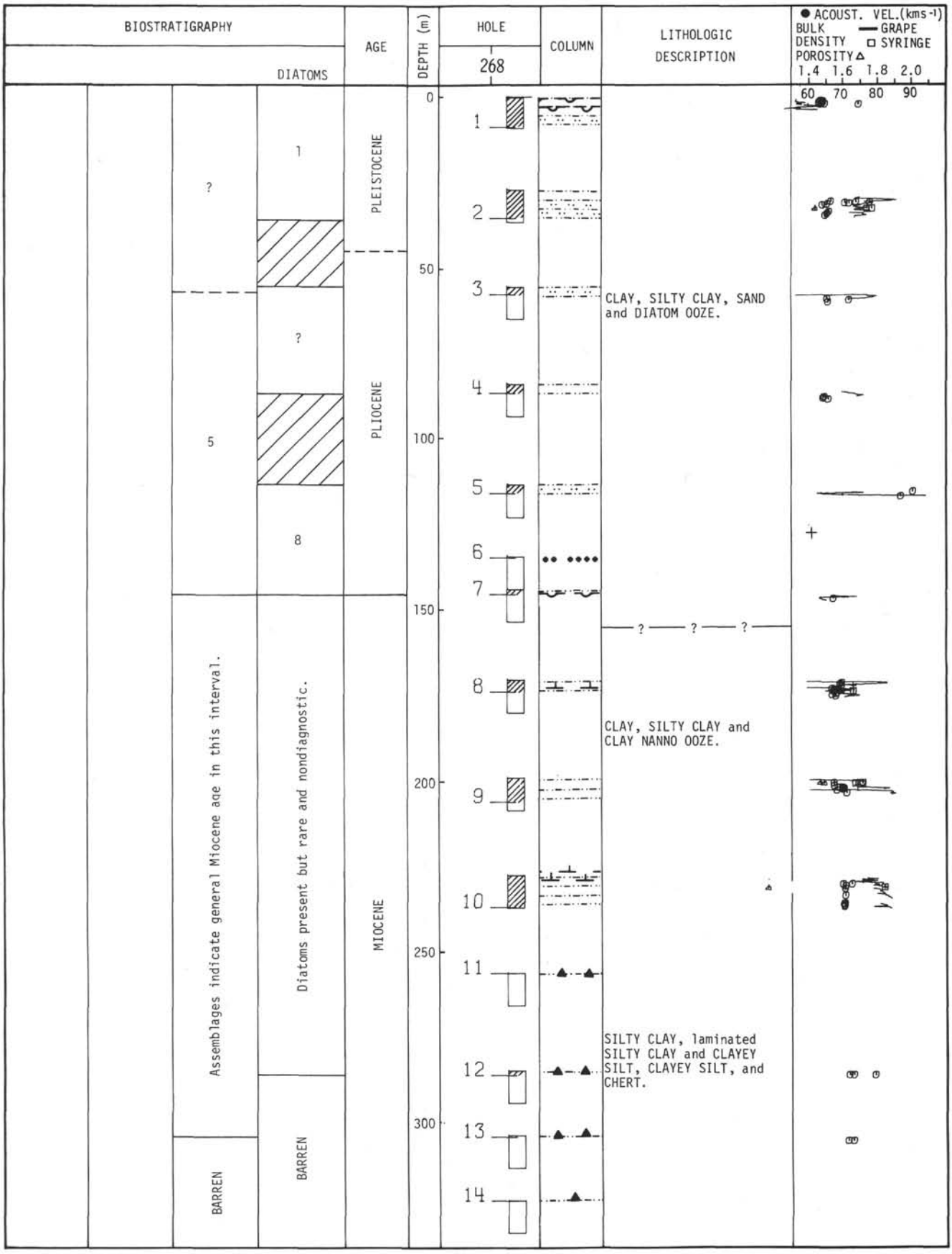


Figure 7. *Graphic hole summary, Site 268.*

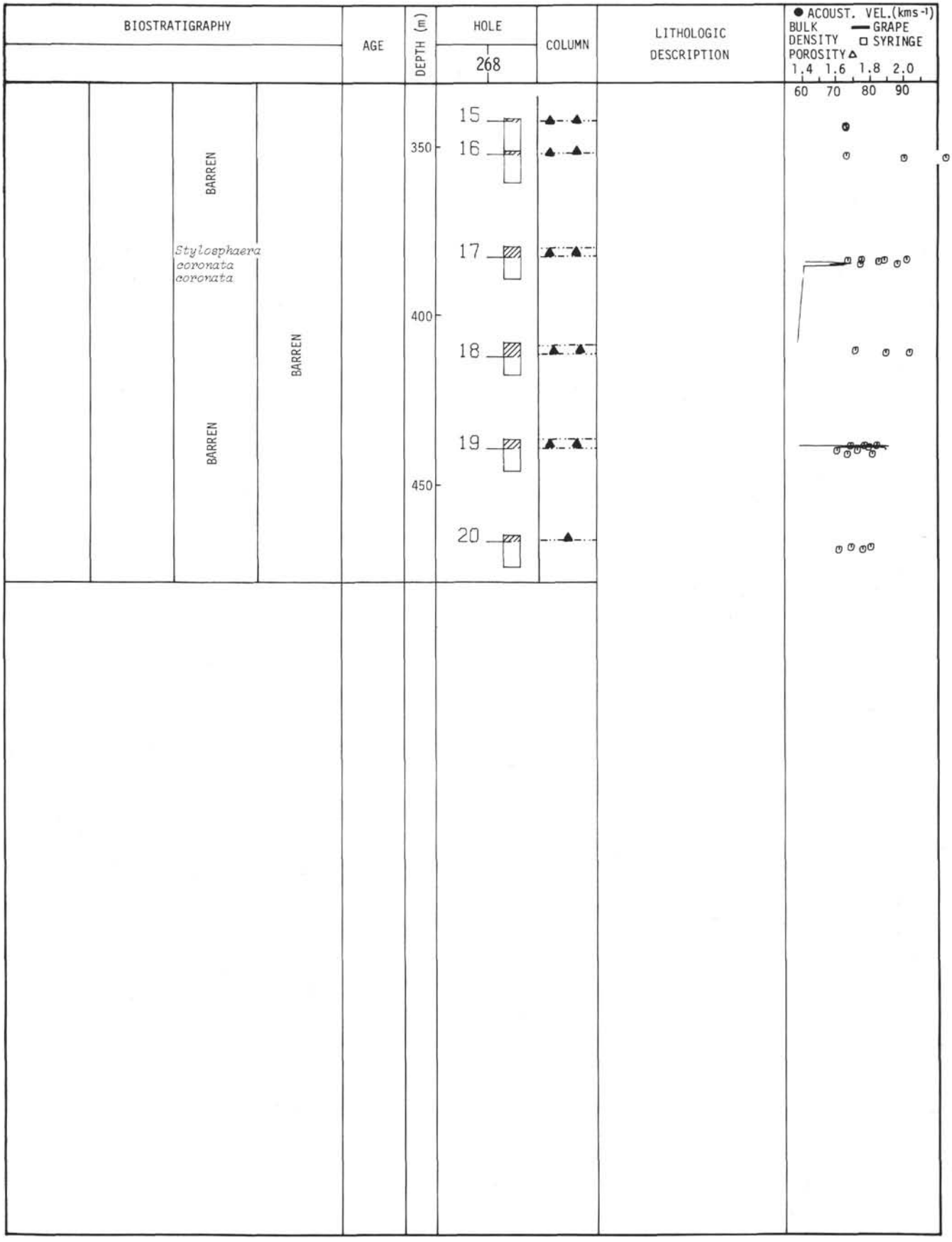


Figure 7. *(Continued).*

Site 268 Hole Core 1 Cored Interval: 0-9 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LATE PLEISTOCENE	Globorotalia pachyderma	R	R	G	1	0.5			*56 *76	Soft, dusky yellow (5Y 6/4) DIATOM OOZE; rare erratic granules, especially in lower part. Sec. 1 (76 cm): 97% diatoms 2% silt TR radiolarians, calcareous nannos
						1.0				
					2				CC *95	
					3					Dark yellowish brown (10YR 4/2) CLAYEY SILT. Moderate brown (5YR 3/4) SILTY CLAY, 2 coarse-sand-bearing thin beds.
					4		VOID			Void: in part, probably washed out fine sand.
					5				*135	Light olive gray (5Y 5/2), SILT RICH, DIATOM OOZE; rare erratic pebbles and granules. Sec. 5 (135 cm): 80% diatoms 15% silt 3% clay TR radiolarians, sponge spicules
									20	
		F	A	M	6				*78 *81	Pale brown (5YR 5/2) SILTY CLAY passing down to yellowish gray (5Y 6/2) CLAYEY SILT. Very fine quartz SAND passing down into very fine FORAMINIFERAL SAND. Mixture of sand-rich clayey silt with many pebbles and granules (20-40% of sediment), and pieces of clayey silt. May be a highly disturbed alternation of beds, or the pieces of clayey silt may be clasts.
		D N R	P C R	P M P	Core Catcher					

Site 268 Hole Core 2 Cored Interval: 28-37.5 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
							VOIDS			Core soft throughout.
LATE PLEISTOCENE	PLEISTOCENE BRUNHES	D	A	G	1	0.5			*91	Alternating beds of brownish gray (5YR 4/1) SILTY CLAY and olive gray (5Y 4/1) diatom-bearing SILTY CLAY. Scattered erratic pebbles, granules and sand, commoner in diatom-bearing lithologies. Some medium silt thin laminae in the brownish gray silty clay.
						1.0			CC *143	Smear slide 5YR 4/1 material (Sec. 1, 143 cm): 68% clay 30% silt TR diatoms, radiolarians, sand
					2				CC	two graded fine sand-coarse silt beds Smear slide 5Y 4/1 material (Sec. 3, 34 cm): 68% clay 25% silt 5% diatoms TR sponge spicules
					3				*34 CC	Alternating thin beds of 5YR 4/1 silty clay and 5Y 4/1 diatom-bearing silty clay.
									*108	Bulk X-ray (33.1 m): Amorph. - 42.1% Ident. - 57.9% Quar. - 36.8% K-Fe. - 19.8% Plag. - 17.5% Kaol. - 1.3% Mica - 21.3% Chlo. - 2.1% Amph. - 1.1%
					4				*25 XM CC XM CC	
									*106	Bulk X-ray (33.2 m): Amorph. - 53.7% Ident. - 46.3% Quar. - 29.7% K-Fe. - 16.7% Plag. - 18.8% Kaol. - 1.5% Mica - 26.9% Chlo. - 1.7% Mont. - 2.7% Amph. - 2.0%
					5					
					6				*67	
		N F D R			Core Catcher				*150	clayey silt medium and fine sand clayey silt

Explanatory notes in Chapter 1

Site 268 Hole Core 3 Cored Interval: 56.5-66 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
?		N F D R			1	0.5	VOID			Core stiff throughout.
						1.0			*82	Brown gray (5YR 4/1) SILTY CLAY; some medium silt thin laminae.
					2				*138	
									*59	very fine sand
										coarse silt bed
									*103	large pebble
									*126	Dark grayish green (5GY 4/1) SILTY CLAY; rare? erratic coarse sand.
					Core Catcher					Sec. 2 (126 cm): 80% clay 20% silt TR radiolarians, diatoms
										10Y 4/2 SILTY CLAY with pebbles

Site 268 Hole Core 4 Cored Interval: 85-94.5 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
PLIOCENE		N F D R	P R	P M	1	0.5	VOID			Core stiff throughout.
						1.0			*97	Block of diatom ooze at 97 cm.
					2				*12	Dark yellowish brown (10YR 4/2) SILTY CLAY and CLAY; diatom bearing in places; scattered erratic pebbles, granules and coarse sand.
					Core Catcher					Granules and coarse sand common. Sec. 2 (12 cm): 85% clay 12% silt 3% diatoms

Site 268 Hole Core 5 Cored Interval: 113.5-123 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
LATE MIOCENE		N F D R	M R	P P	1	0.5			*52	10YR 3/3 SILTY CLAY
						1.0			*94	10Y 4/2 PEBBLE-RICH SILTY CLAY, diatom rich
							VOID			Grayish olive (10Y 4/2) DIATOM SILTY CLAY Graded bed fine SAND-coarse SILT
					2				*56	5Y 4/1 clayey silt with fine pebbles
										10Y 4/2 and 10YR 3/3 (alternating thin beds) SILTY CLAY with granules
									115 120	5YR 3/3 SILTY CLAY with pebbles
										5YR 3/3 SILTY CLAY
										5YR 3/3 CLAYEY SILT
										Graded bed very fine SAND and coarse SILT
										10Y 4/2 SILTY CLAY SAND-SILT-CLAY 5Y 4/1
										5Y 4/1 CLAYEY SILT with pebbles
					Core Catcher					5Y 4/1 SILTY CLAY with fine pebbles
										Smear slide of (10Y 4/2) diatom silty clay. Sec. 1 (52 cm): 60% clay 30% diatoms 10% silt TR sponge spicules
										Core stiff throughout.
										Diatom bearing SILTY CLAY with pebbles.

Site 268 Hole Core 6 Cored Interval: 134.5-144 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO.SAMPLE	LITHOLOGIC DESCRIPTION
MIOCENE		N D N R	P	P	1	0.5	VOID			Blacks of medium and coarse grained ACID IGNEOUS rocks, presumed erratic boulders.
						1.0				Microdiorite Granite Gneiss Granite Microdiorite
										No core catcher sample.

Explanatory notes in Chapter 1

Site 268 Hole Core 7 Cored Interval: 144-153.5 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
MIOCENE		D N	P	P	1	0.5 – 1.0	VOID			GRAINTE and AMPHIBOLITE, presumed erratics
					2				*30	5YR 3/4 SILTY CLAY 5 cm microdiorite pebble 10Y 4/2 DIATOM OOZE, rare pebbles and granules
									*102	Grayish olive 10Y 4/2 silty-clay-rich DIATOM OOZE; rare granules and coarse sand. Sec. 2 (102 cm): 68% diatoms 20% clay 12% silt
										No core catcher sample.

Site 268 Hole Core 8 Cored Interval: 170.5-180 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
LOWER MIOCENE	Discoaster deflandrei / Catapsydrax unicavus	N F D R	C P R	P M F M	1	0.5 – 1.0			*24 26* XM *42 57XN *73 *78CC *107	10Y 4/2 and 5Y 4/1 diatom-bearing SILTY CLAY. CLAY, 10R 4/2, rare granules and coarse sand. Diatom-bearing NANNOFOSSIL CLAY, 5Y 4/1. Olive gray (5Y 4/1) NANNOFOSSIL CLAY and NANNOFOSSIL SILTY CLAY.
					2		VOID		*80 CC *128	Dark greenish gray (5GY 4/1) CLAY, diatom-rich NANNOFOSSIL OOZE, and CLAY NANNOFOSSIL OOZE very rare granules and coarse sand. Sec. 2 (128 cm): 55% calcareous nannos 20% diatoms 15% clay 5% silt 1% forams TR volcanic glass, radiolarians
					3		VOID		GZ	5YR 3/2 SILTY CLAY Olive gray (5Y 4/1) CLAY NANNO OOZE
					Core Catcher					Core stiff throughout. 5Y 4/1 silty clay rich, diatom-bearing NANNO OOZE.

Bulk X-ray (170.9 m):		Bulk X-ray (171.2 m):	
Amorph.	- 47.8%	Amorph.	- 47.9%
Ident.	- 52.2%	Ident.	- 52.1%
Quar.	- 44.4%	Quar.	- 36.2%
K-Fe.	- 12.6%	K-Fe.	- 9.8%
Plag.	- 14.1%	Plag.	- 12.6%
Mica	- 24.7%	Mica	- 33.6%
Chlo.	- 3.0%	Chlo.	- 3.9%
Amph.	- 1.2%	Hema.	- 2.7%
		Amph.	- 1.2%

Site 268 Hole Core 9 Cored Interval: 199-208.5 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
MIOCENE					1	0.5 – 1.0	VOID		*98 CC *145	Dark greenish gray (5GY 4/1) and olive gray (5Y 4/1) CLAY; rare granules and coarse sand. Color 5Y 4/1 Sec. 1 (98 cm): 90% clay 5% silt 3% diatoms TR sand
					2				*74 CC 92* *93	Color 5GY 4/1 5YR 3/2 silty clay Color 5GY 4/1
					3		VOID		*64 *82	Grayish brown (5YR 3/2) SILTY CLAY; some medium silt thin laminae. Sec. 3 (82 cm): 40% clay 50% silt 5% diatoms 2% sponge spicules TR radiolarians
					4		VOID			
					5		VOID			
		N F D R	P R	P P	Core Catcher				*	

Explanatory notes in Chapter 1

Site 268 Hole Core 10 Cored Interval: 227.5-237 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
MIOCENE		N	F	P	1	0.5			*10 CC	Olive gray (5Y 5/1) CLAY NANNOFOSSIL OOZE.
						1.0			*104	5Y 3/1 CLAYEY SILT 10YR 4/2 5G 4/1 5Y 3/1 SILTY CLAY
									*141	Bulk X-ray (229.4 m): Amorph. - 48.3% Ident. - 51.7% Quar. - 40.4% K-Fe. - 16.7% Plag. - 15.1% Mica - 22.4% Chlo. - 2.6% Hema. - 1.7% Amph. - 1.0%
					2				GZ	
									*84	
									*129	Dark yellowish brown (10YR 4/2) LAMINATED SILTY CLAY and CLAYEY SILT.
									*137	
					3				CC	Smear slide silty lamina, Sec. 2 (84 cm): 65% silt 15% clay 12% diatoms 5% radiolarians 5% sponge spicules
					4				*104	Smear slide silty clay, Sec. 2 (129 cm): 55% clay 40% silt 5% diatoms 1% sponge spicules TR radiolarians, silicoflagellates
					5					Core stiff to semilithified throughout; trace of very coarse sand grains.
					6				*17	Olive gray (5Y 4/1) laminated, diatom-bearing SILTY CLAY
									*58	Brownish gray (5YR 4/1) SILTY CLAY
									CC	Grayish red (10R 4/2) CLAY
										Brown gray (5YR 4/1) SILTY CLAY
										Dark yellowish brown (10YR 4/2) LAMINATED SILTY CLAY and CLAYEY SILT.
		N F D R	I I R	I I P	Core Catcher				*	

Site 268 Hole Core 11 Cored Interval: 256-265.5 m

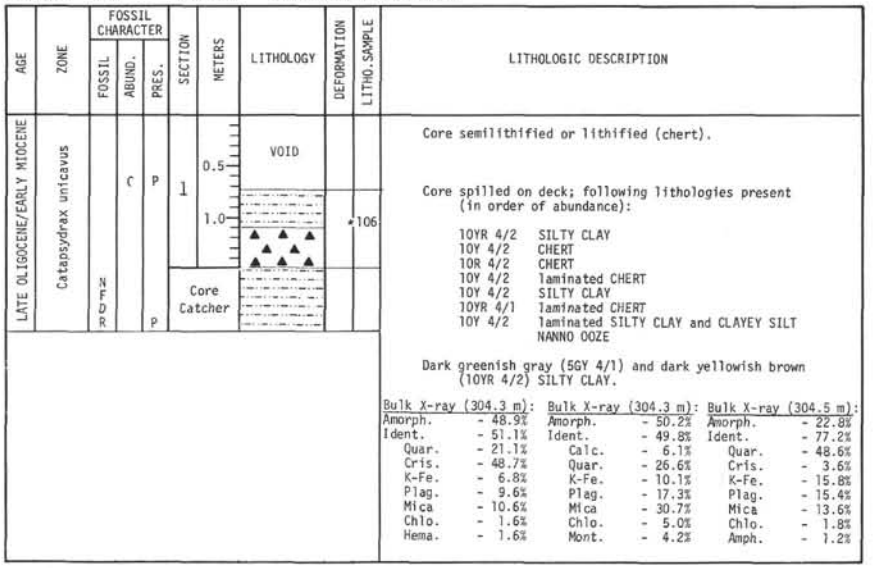
AGE	ZONE	FOSSIL CHARACTER: FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
MIOCENE		N F D R	P R	P P	1	0.5	VOID			Semilithified moderate brown (5YR 3/4) SILTY CLAY.
						1.0			*130	CHERT, grayish red (10R 4/2) black with granule clast dark greenish gray (5G 4/1) blocks. Sec. 1 (130 cm): 65% silt 30% clay 2% diatoms 2% sponge spicules TR radiolarians, silicoflagellates
					Core Catcher					5YR 4/1 CLAYEY SILT 10Y 4/2 SILTY CLAY CHERT

Site 268 Hole Core 12 Cored Interval: 284.5-294 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	ABUND.	PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
MIOCENE	Catapsydrax unicavus	N F D R	R R R R	P P P P	1	0.5			GZ	10R 4/2 CHERT
						1.0			*90	Dark yellowish brown (10YR 4/2) laminated SILTY CLAY and CLAYEY SILT. Core semilithified or lithified (chert).
					Core Catcher					10YR 4/2 diatom bearing SILTY CLAY 10Y 4/2 diatom bearing CLAY 5Y 3/2 CHERT

Explanatory notes in Chapter 1

Site 268 Hole Core 13 Cored Interval: 303.5-313 m



LITHOLOGIC DESCRIPTION

Core semilithified or lithified (chert).

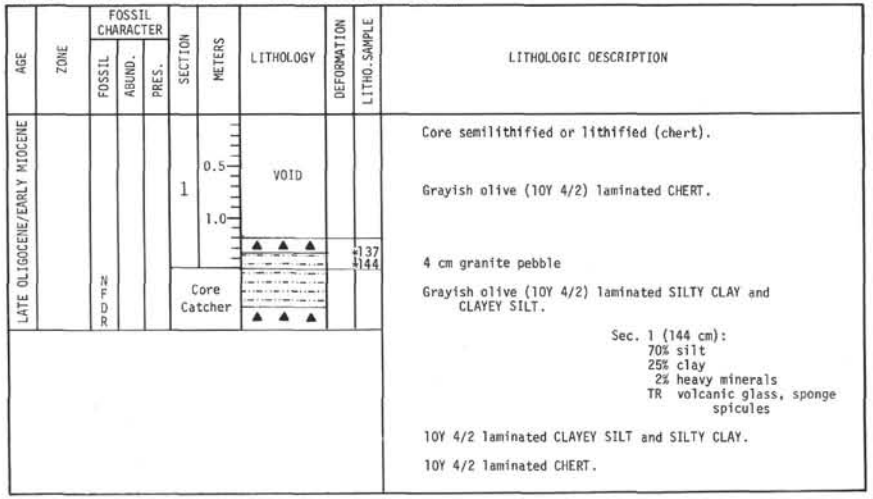
Core spilled on deck; following lithologies present (in order of abundance):

10YR 4/2	SILTY CLAY
10Y 4/2	CHERT
10R 4/2	CHERT
10Y 4/2	laminated CHERT
10Y 4/2	SILTY CLAY
10YR 4/1	laminated CHERT
10Y 4/2	laminated SILTY CLAY and CLAYEY SILT
	NANNO OOZE

Dark greenish gray (5GY 4/1) and dark yellowish brown (10YR 4/2) SILTY CLAY.

Bulk X-ray (304.3 m):		Bulk X-ray (304.3 m):		Bulk X-ray (304.5 m):	
Amorph.	48.9%	Amorph.	50.2%	Amorph.	22.8%
Ident.	51.1%	Ident.	49.8%	Ident.	77.2%
Quar.	21.1%	Calc.	6.1%	Quar.	48.6%
Cris.	48.7%	Quar.	26.6%	Cris.	3.6%
K-Fe.	6.8%	K-Fe.	10.1%	K-Fe.	15.8%
Plag.	9.6%	Plag.	17.3%	Plag.	15.4%
Mica	10.6%	Mica	30.7%	Mica	13.6%
Chlo.	1.6%	Chlo.	5.0%	Chlo.	1.8%
Hema.	1.6%	Mont.	4.2%	Amph.	1.2%

Site 268 Hole Core 14 Cored Interval: 322.5-332 m



LITHOLOGIC DESCRIPTION

Core semilithified or lithified (chert).

Grayish olive (10Y 4/2) laminated CHERT.

4 cm granite pebble

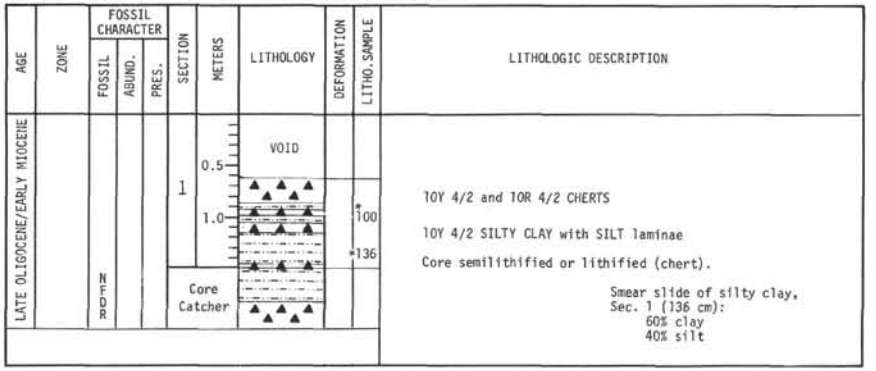
Grayish olive (10Y 4/2) laminated SILTY CLAY and CLAYEY SILT.

Sec. 1 (144 cm):
70% silt
25% clay
2% heavy minerals
TR volcanic glass, sponge spicules

10Y 4/2 laminated CLAYEY SILT and SILTY CLAY.

10Y 4/2 laminated CHERT.

Site 268 Hole Core 15 Cored Interval: 341.5-351 m



LITHOLOGIC DESCRIPTION

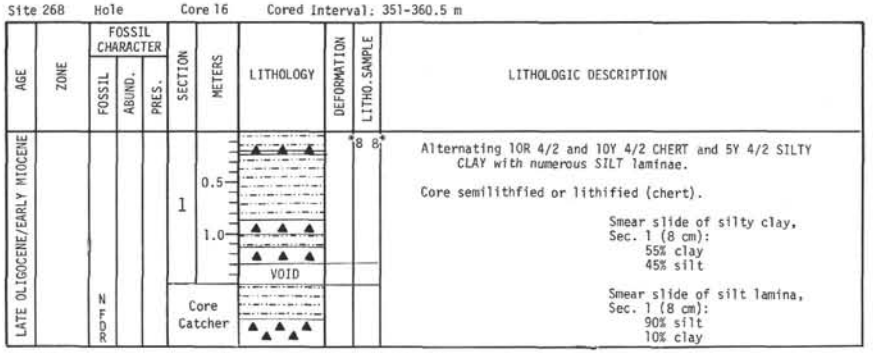
10Y 4/2 and 10R 4/2 CHERTS

10Y 4/2 SILTY CLAY with SILT laminae

Core semilithified or lithified (chert).

Smear slide of silty clay,
Sec. 1 (136 cm):
60% clay
40% silt

Site 268 Hole Core 16 Cored Interval: 351-360.5 m



LITHOLOGIC DESCRIPTION

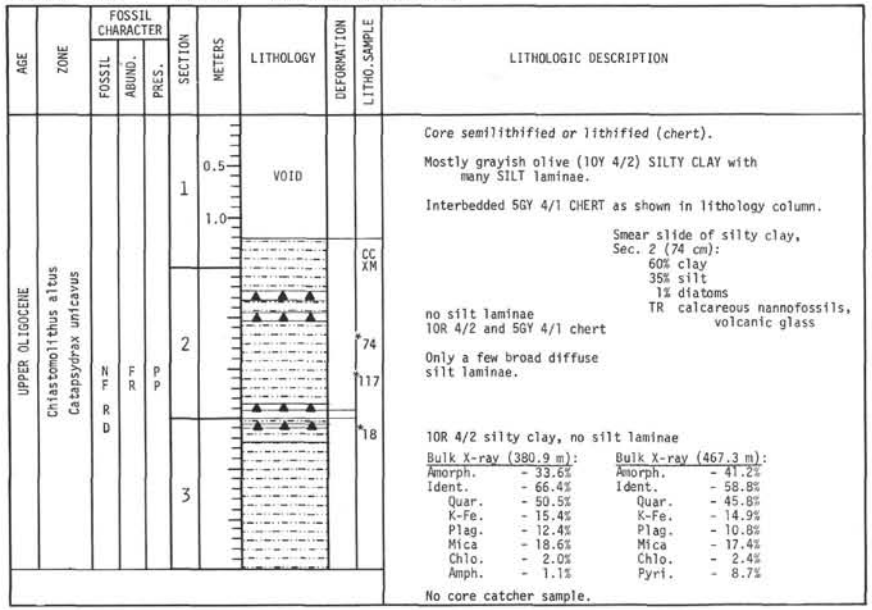
Alternating 10R 4/2 and 10Y 4/2 CHERT and 5Y 4/2 SILTY CLAY with numerous SILT laminae.

Core semilithfied or lithified (chert).

Smear slide of silty clay,
Sec. 1 (8 cm):
55% clay
45% silt

Smear slide of silt lamina,
Sec. 1 (8 cm):
90% silt
10% clay

Site 268 Hole Core 17 Cored Interval: 379.5-389 m



LITHOLOGIC DESCRIPTION

Core semilithified or lithified (chert).

Mostly grayish olive (10Y 4/2) SILTY CLAY with many SILT laminae.

Interbedded 5GY 4/1 CHERT as shown in lithology column.

Smear slide of silty clay,
Sec. 2 (74 cm):
60% clay
35% silt
1% diatoms
TR calcareous nannofossils, volcanic glass

no silt laminae
10R 4/2 and 5GY 4/1 chert

Only a few broad diffuse silt laminae.

10R 4/2 silty clay, no silt laminae

Bulk X-ray (380.9 m):		Bulk X-ray (467.3 m):	
Amorph.	33.6%	Amorph.	41.2%
Ident.	66.4%	Ident.	58.8%
Quar.	50.5%	Quar.	45.8%
K-Fe.	15.4%	K-Fe.	14.9%
Plag.	12.4%	Plag.	10.8%
Mica	18.6%	Mica	17.4%
Chlo.	2.0%	Chlo.	2.4%
Amph.	1.1%	Pyri.	8.7%

No core catcher sample.

Explanatory notes in Chapter 1

Site 268 Hole Core 18 Cored Interval: 408-417.5 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
?		N F D R			1	0.5			*54	Core semilithified or lithified (chert). 5YR 4/1 silty clay, no silt laminae
						1.0			*106	Dark greenish gray (5GY 4/1) SILTY CLAY; in most places, with many SILT laminae; 5GY 4/1 CHERT as shown in lithology column. Smear slide of silty clay, Sec. 1 (106 cm): 70% clay 30% silt
					2					
					3				*9	silt laminae common Dark greenish gray (5GY 4/1) SILTY CLAY; few silt laminae.
					Core Catcher					5GY 2/1 CHERT About 15 horizons in core of diagenetic ($?MnO_2$) blackening of silt laminae, commonest in lower part of core. Grayish olive (10Y 4/2) silty clay.

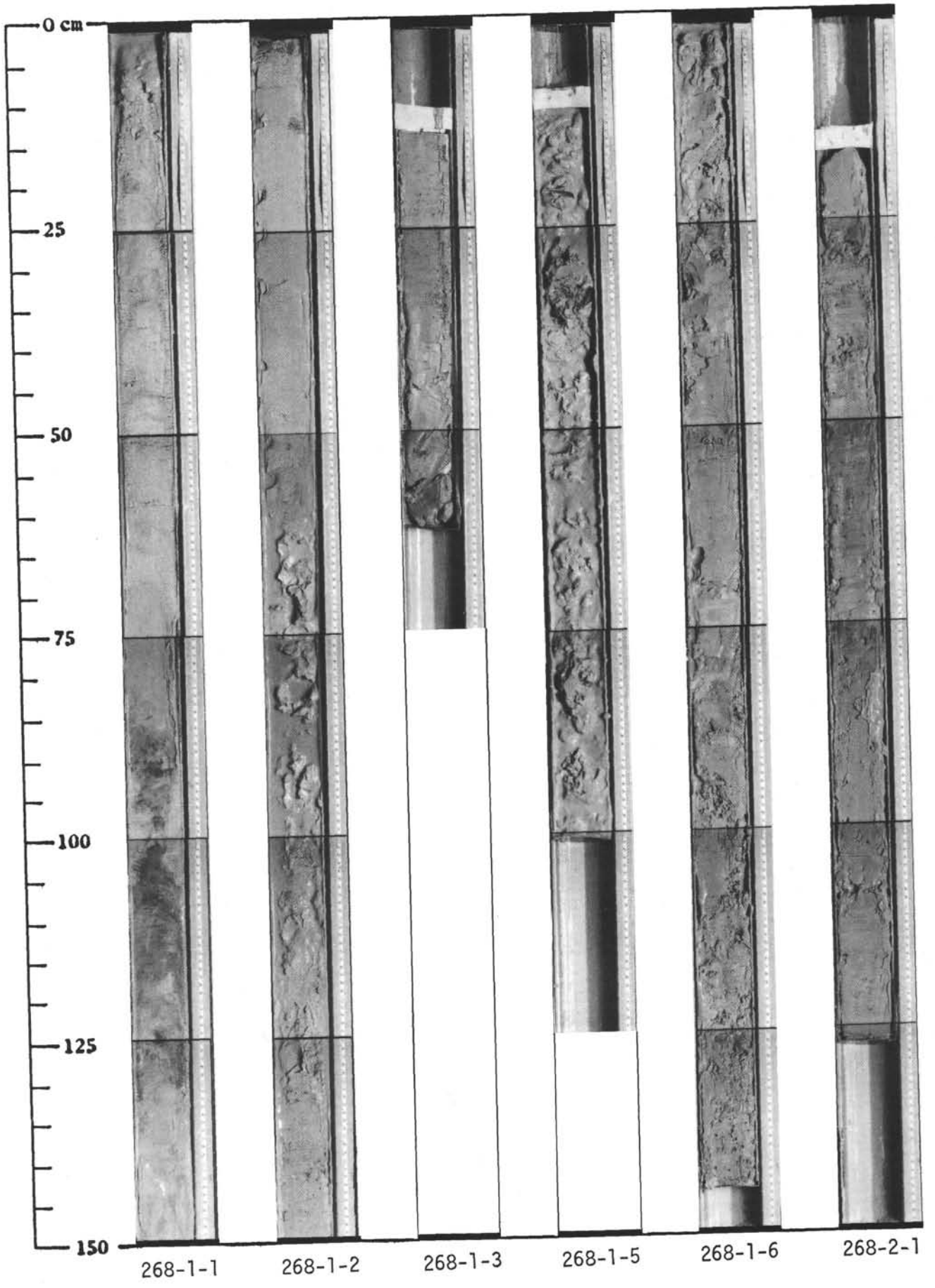
Site 268 Hole Core 19 Cored Interval: 436.5-446 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
?		N F D R	R	P	1	0.5				5Y 2/1 CHERT Core semilithified or lithified (chert).
						1.0			*99 CC CC *134* *135	5Y 2/1 CHERT Smear slide of silty clay, Sec. 1 (134 cm): 60% clay 35% silt 5% diatoms
					2				*38 *41	Dark greenish gray (5GY 4/1) SILTY CLAY; a few silt laminae in Sec. 2. Chert in Sec. 2 (80 cm) has bed of sand and granules. 5GY 4/1 CHERT
					Core Catcher					5GY 4/1 CHERT

Site 268 Hole Core 20 Cored Interval: 465-474.5 m

AGE	ZONE	FOSSIL CHARACTER: FOSSIL	FOSSIL CHARACTER: ABUND.	FOSSIL CHARACTER: PRES.	SECTION	METERS	LITHOLOGY	DEFORMATION	LITHO. SAMPLE	LITHOLOGIC DESCRIPTION
?		N F D R			1	0.5	VOID			Core semilithified or lithified (chert).
						1.0			*133	Dark greenish gray (5GY 4/1) SILTY CLAY; rare silt laminae; some 5GY 4/1 CHERT, as shown in lithology column. Smear slide of silty clay, Sec. 1 (133 cm): 90% clay 10% silt
					2				XM *86 93*	
							VOID			
					Core Catcher					

Explanatory notes in Chapter 1


0 cm
25
50
75
100
125
150
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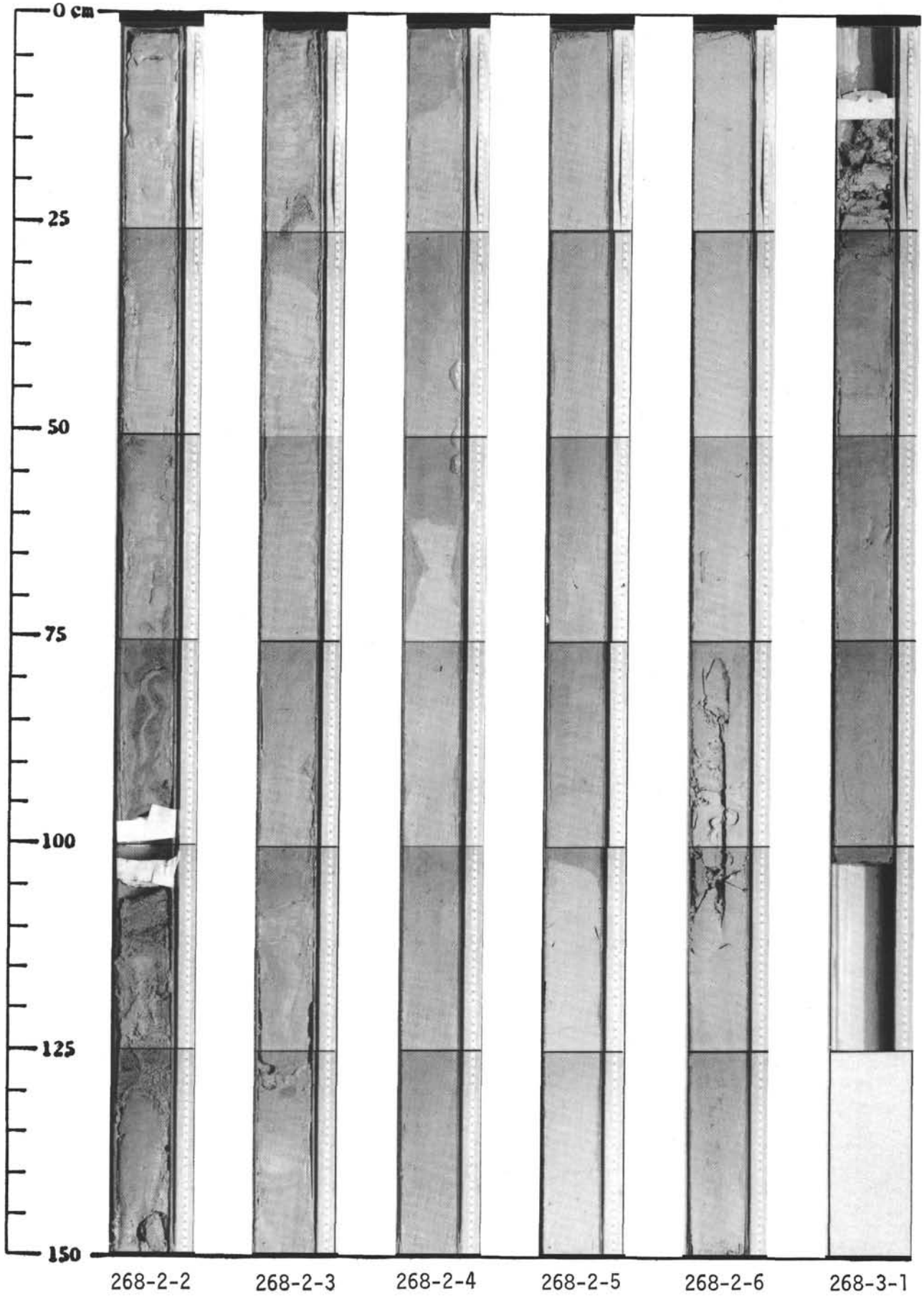
268-1-2
268-1-3
268-1-5
268-1-6
268-2-1


0 cm
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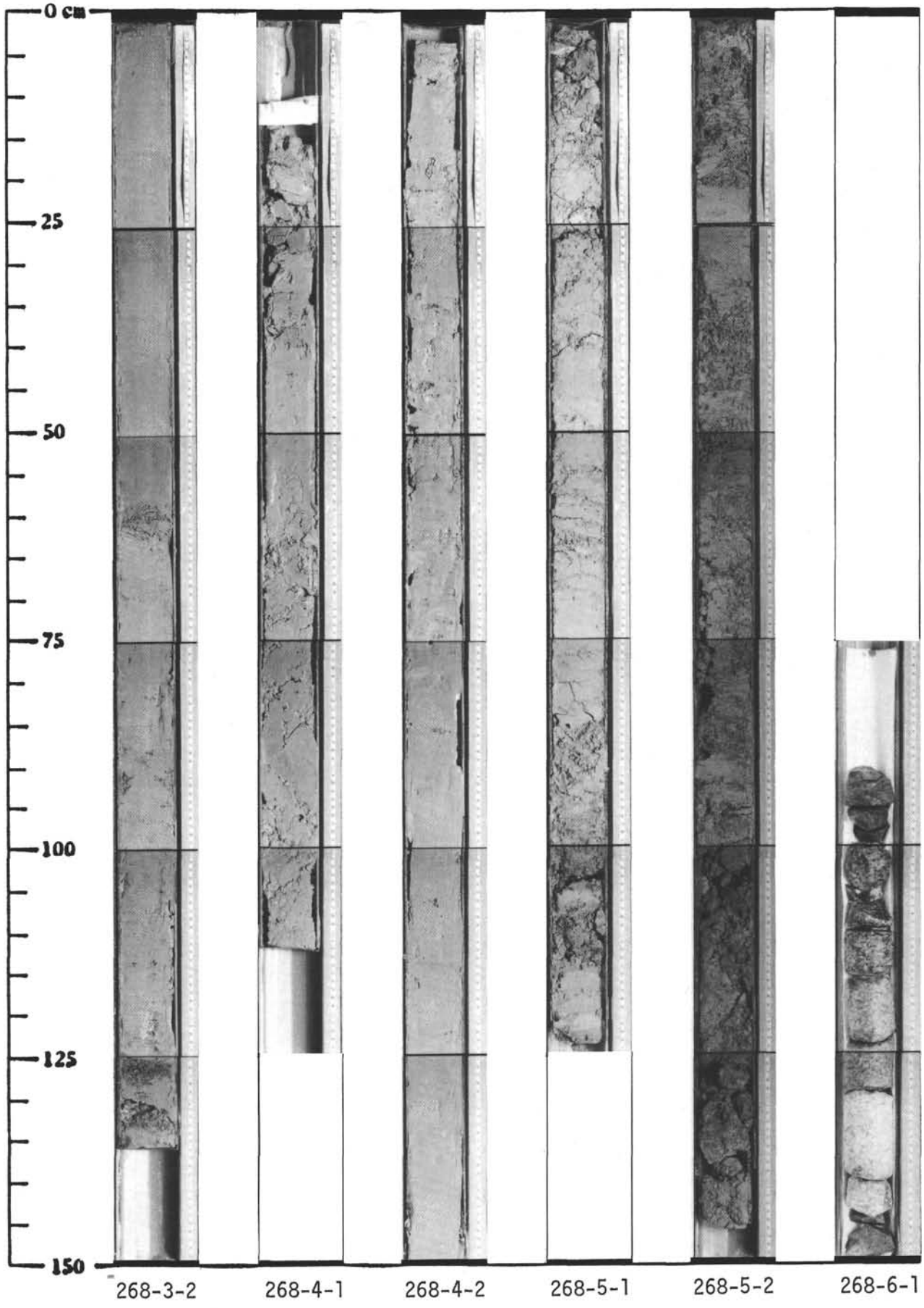
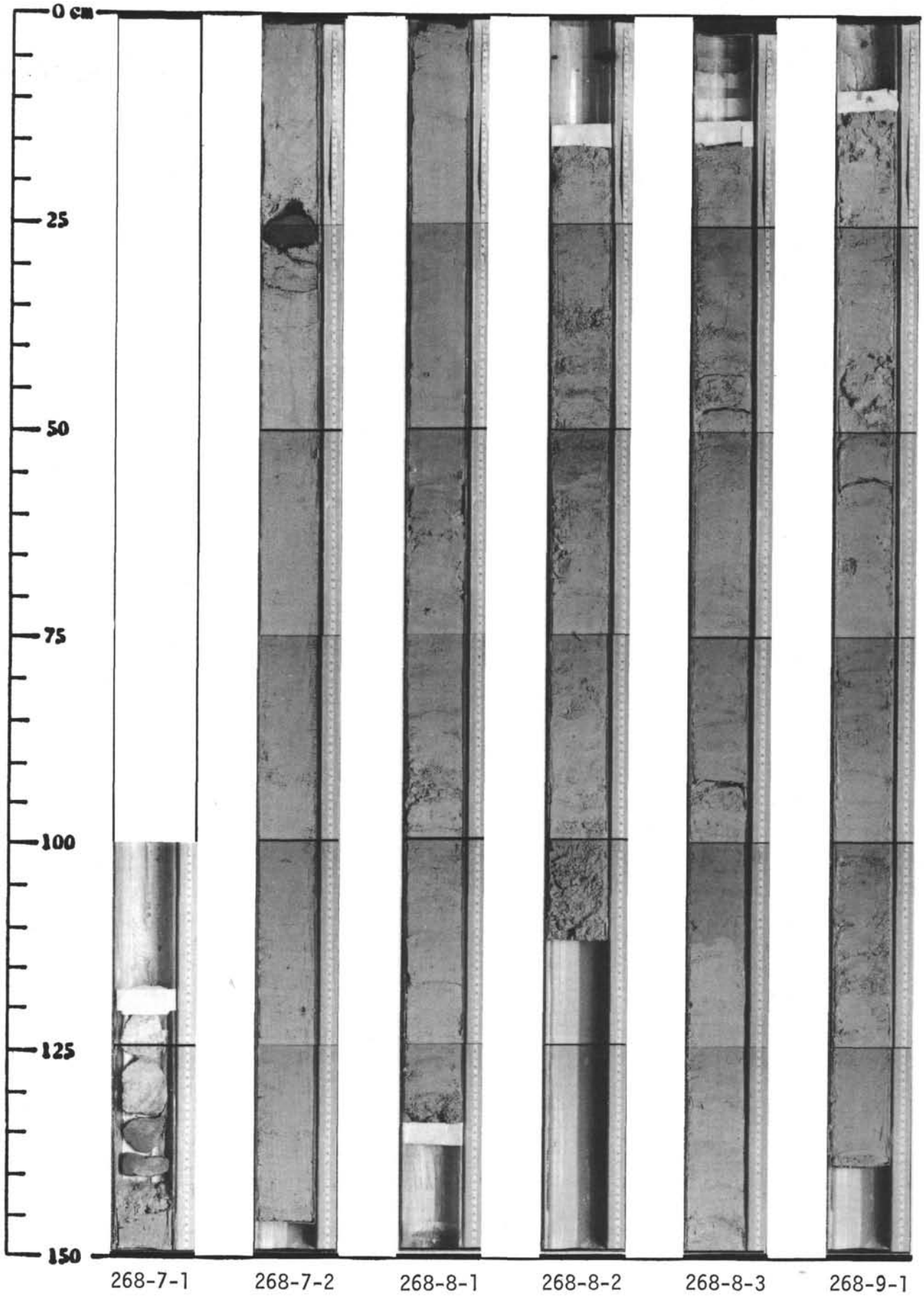
50
75
100
125
150
268-2-2
268-2-3
268-2-4
268-2-5
268-2-6
268-3-1


0 cm
25
50
75
100
125
150
268-3-2
268-4-1
268-4-2
268-5-1
268-5-2
268-6-1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75
100
125
150
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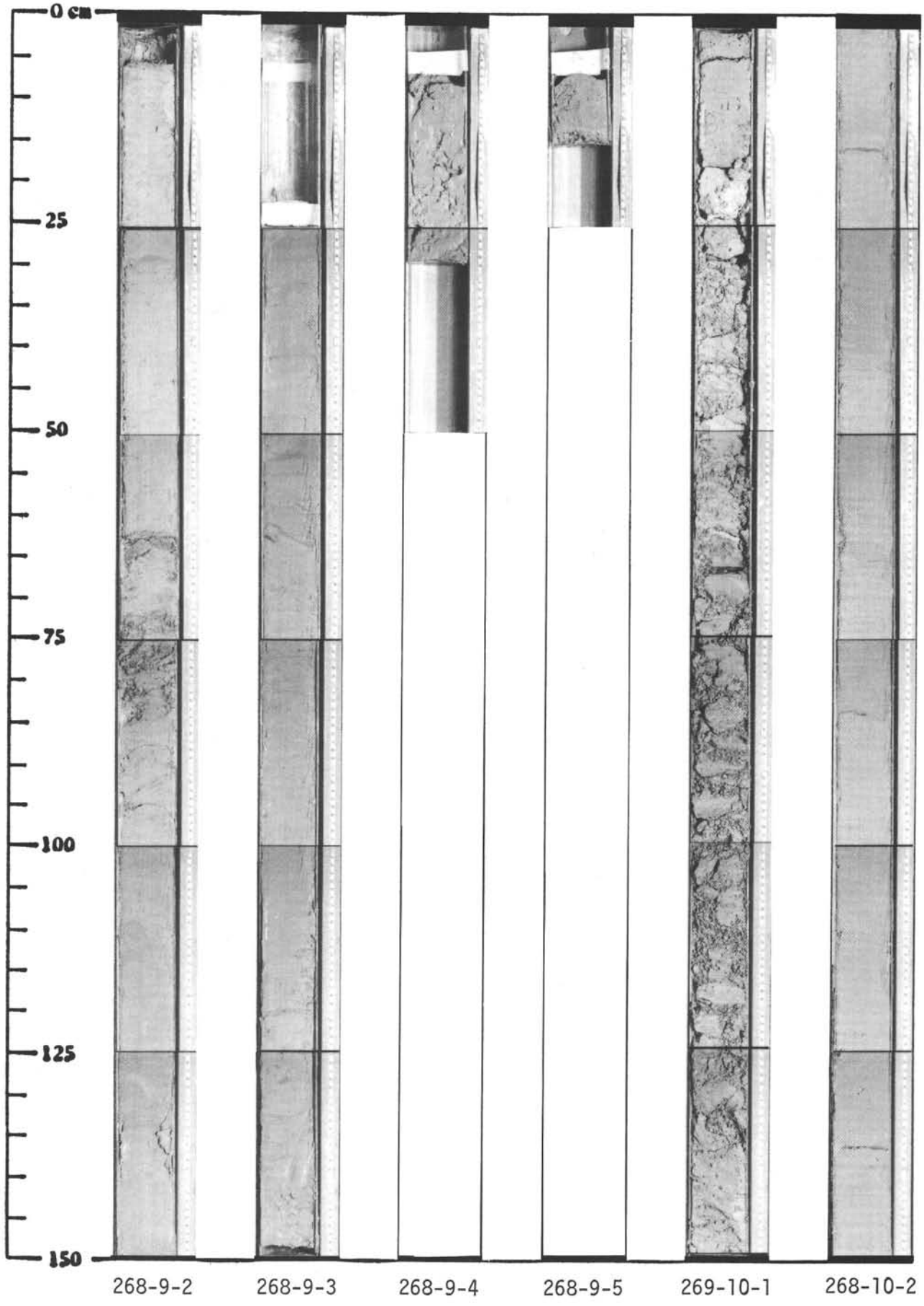
268-7-2
268-8-1
268-8-2
268-8-3
268-9-1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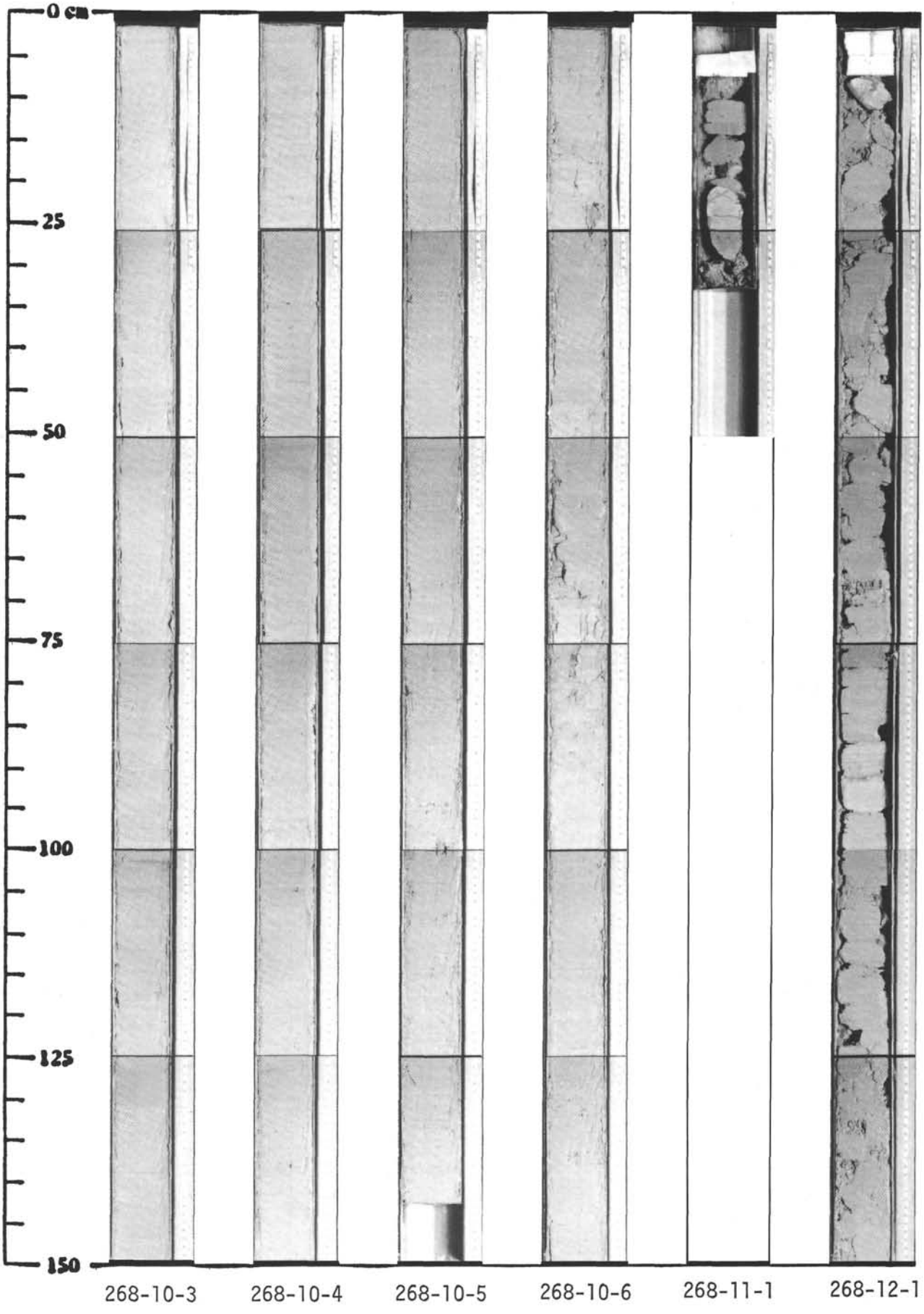
75
100
125
150
268-9-2
268-9-3
268-9-4
268-9-5
269-10-1
268-10-2


0 cm
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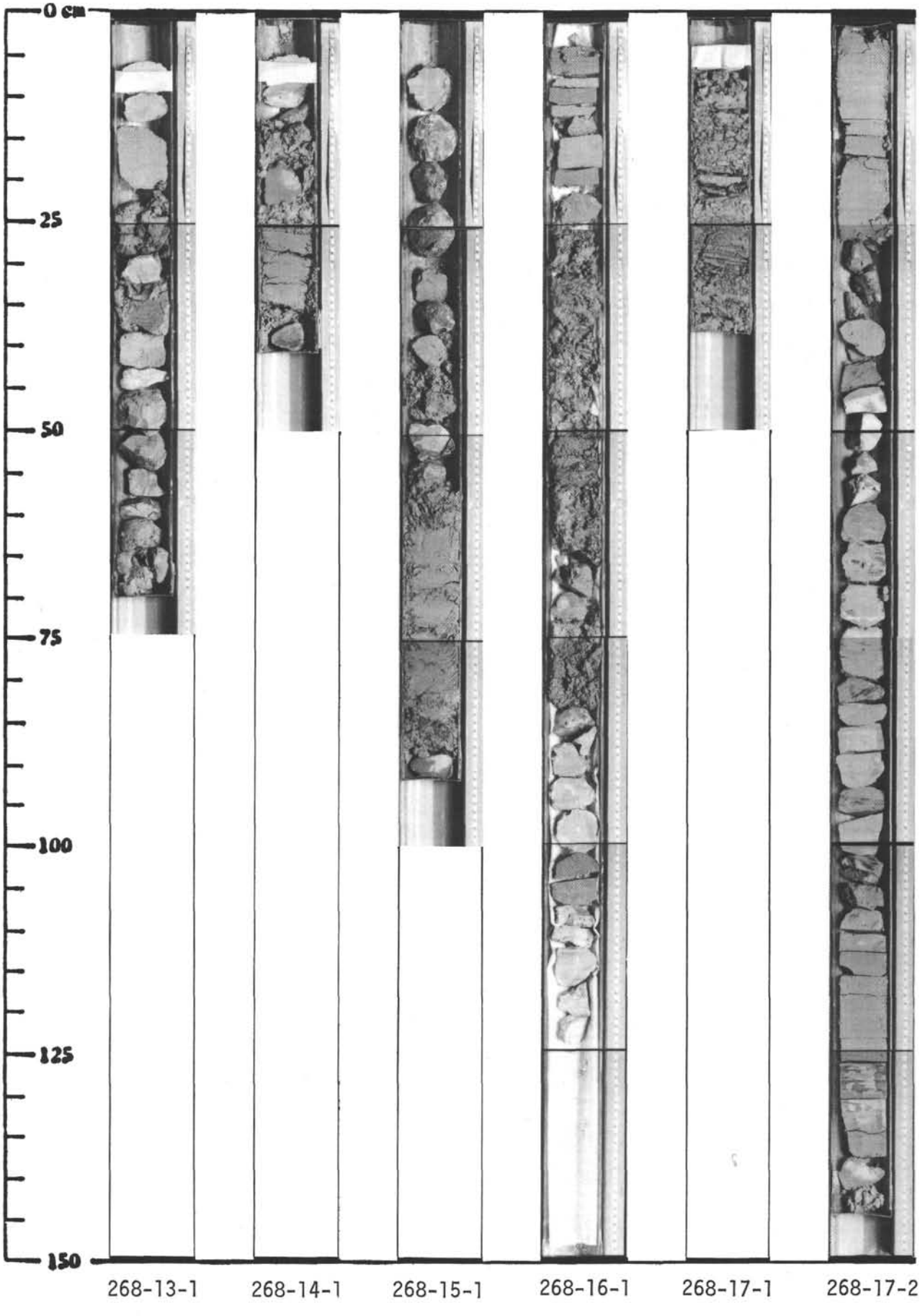
50
75
100
125
150
268-10-3
268-10-4
268-10-5
268-10-6
268-11-1
268-12-1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75
100
125
150
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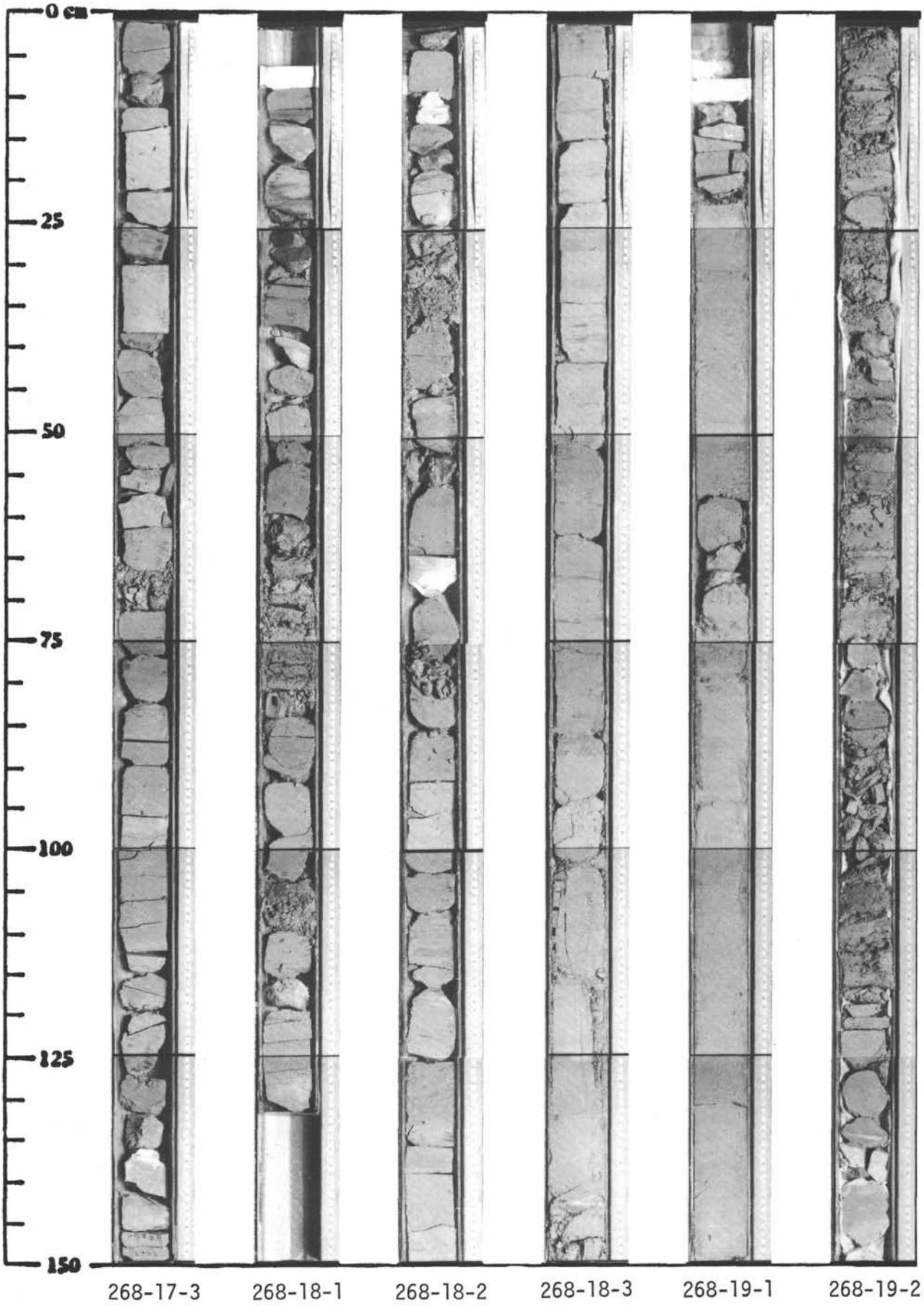
268-14-1
268-15-1
268-16-1
268-17-1
268-17-2


0 cm
25
50
75
100
125
150
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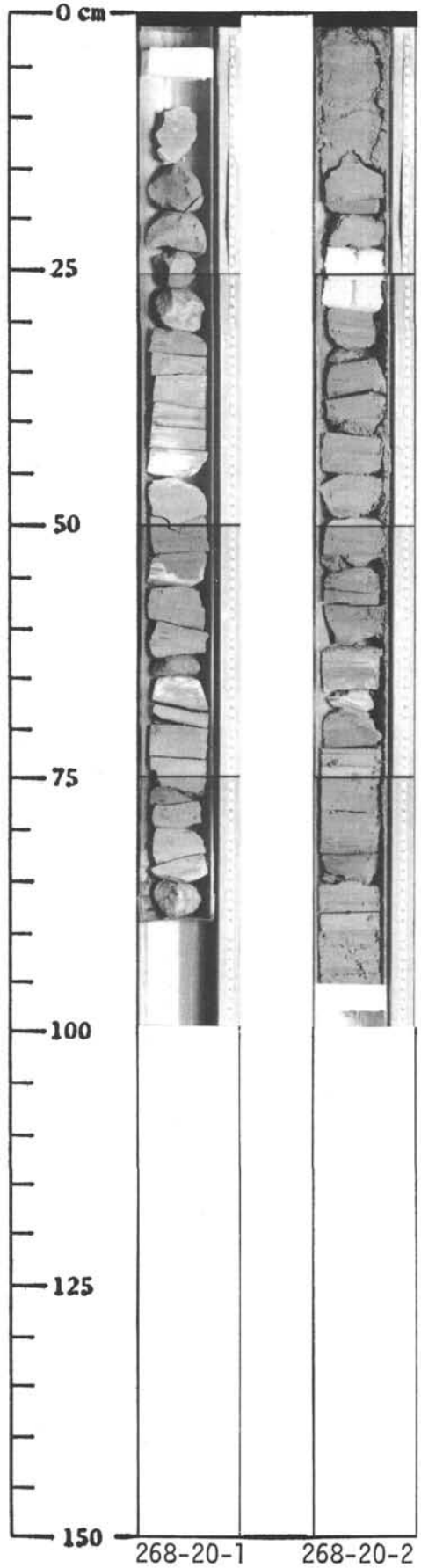
268-18-1
268-18-2
268-18-3
268-19-1
268-19-2


0 cm
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50
75
100
125
150
268-20-1
268-20-2