

## 17. PRELIMINARY REPORT ON PALEOMAGNETISM OF DEEP SEA DRILLING PROJECT LEG 2 SPECIMENS

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The core locations and descriptions of cores are given elsewhere in this report. All paleomagnetic measurements were made at Lamont-Doherty Geological Observatory on magnetometers of the type described by Foster, 1966. The natural remanent magnetization (NRM) of all specimens was measured and each specimen was then partially demagnetized in alternating fields of 50 oersteds. Selected specimens (one from each drill hole) were progressively demagnetized in fields up to 200 oersteds and A.F. demagnetization curves were plotted.

The intensity of magnetization varies widely both within each site and between sites from about  $1 \times 10^{-7}$  emu/gram to  $2 \times 10^{-4}$  emu/gram. Intensities at these levels are measurable on most modern magnetometers used to measure sediments. The majority of the specimens have intensities to the  $10^{-6}$  emu/gram level which are easily measurable even after A.F. demagnetization. It must be emphasized that intensities normalized by the methods employed here are only approximate since the specimens are measured and weighted at various states of dessication. However, the numbers given indicate clearly which specimens are easily measurable and which are not.

The A. F. demagnetization curves are typical of stable and partially stable rocks. The relative stability can also be judged by comparing the intensity before and after A. F. cleaning, and in a few cases the intensity actually increases after treatment in 50 oersteds peak field, indicating the removal of an unstable component.

The magnetic inclination has been plotted in Figures 7 through 10 showing whether the specimen is normally (+) or reversely (-) magnetized. Most of the specimens are older than Miocene in age and direct comparison with the known magnetic stratigraphy for the past 5 m.y. or with the sea floor spreading sequence is probably unwarranted, especially since the cores are discontinuous and the age designation is not precise. It should be noted however that in certain core barrels the sediments are often dominantly normal or reversely magnetized in sections of core as old as Eocene and Upper Cretaceous. In some cases the reversals are questionable since the dips are low and the declination does not change  $180^\circ$  with respect to adjacent specimens. These apparent reversals could be caused by disturbance and disorientation of the core during the drilling. In seven cases, changes of greater than  $120^\circ$  occur with changes of inclination within a single barrel making it more likely that a true reversal of the field has been recorded.

<sup>1</sup>Lamont-Doherty Geological Observatory Contribution No. 1392.

**TABLE 1**  
**Summary of Magnetic Data**

Hole	Core	Section	Sampled at (cm)	Depth Below Sea Floor (m)	NRM			50 oersted		
					Decl.	Incl.	Intensity (emu/gm) $\times 10^{-5}$	Decl.	Incl.	Intensity (emu/gm) $\times 10^{-5}$
8	1	1	100-102	168.9	44.4	-35.0	7.3000	59.4	-8.0	4.16000
8	2	1	99-100	250.0	102.0	44.3	0.8850	118.8	30.6	0.26900
8	2	1	100-102 <sup>a</sup>	250.0	110.5	35.1	0.6410	85.4	21.0	0.29800
8	2	2	6-8	250.6	71.3	36.2	1.1400	64.4	25.2	0.66400
8	2	3	12-14	252.1	292.9	54.8	0.7010	229.9	64.5	0.33000
8	2	3	72-74	252.7	299.2	69.4	0.0925	302.1	62.5	0.06620
8A	1	1 <sup>a</sup>	102-104 <sup>a</sup>	279.3	292.5	-8.1	0.3870	298.4	-5.6	0.38300
8A	1	1	108-110	279.4	325.0	-43.1	0.0136	349.7	-49.7	0.00916
8A	1	2	6-8	279.9	200.8	32.2	-	206.5	41.8	-
8A	1	2	83-84	280.5	123.6	-39.7	0.0151	108.4	-11.9	0.01040
9	5	3	48-50	34.9	238.4	67.5	1.2600	237.4	66.8	1.01000
9	5	3	98-100	35.4	337.7	59.8	1.2000	323.4	62.4	0.70700
9	5	4	75-77	36.7	338.6	56.8	0.6570	306.8	34.9	0.52700
9	5	5	70-72	38.1	290.5	77.0	3.6100	298.8	76.4	0.33600
9	7	1	126-128	195.8	250.6	20.6	1.4500	237.0	21.7	1.64000
9	7	2	90-92	196.9	9.7	51.8	19.2000	11.0	51.4	14.80000
9	7	4 <sup>a</sup>	74-76 <sup>a</sup>	199.7	243.4	-26.8	1.3600	251.8	-40.4	1.43000
9	8	4	89-91	209.0	40.8	65.6	2.1200	49.7	50.7	1.73000
9	8	4	100-103	209.1	320.3	65.1	1.7700	326.6	62.3	1.55000
9	8	5	15-18	209.8	96.9	73.5	2.7100	76.6	67.3	2.18000
9	8	6	18-20	211.3	170.9	2.4	0.7980	162.6	-29.6	0.98000
9	9	2	3-5	303.0	155.9	57.6	0.6230	132.2	19.8	0.27900
9	9	2	78-80	303.8	335.5	-38.7	0.8070	334.8	-56.6	1.32000
9	9	3	7-10	304.6	140.1	43.8	0.0123	246.0	21.1	0.00605

<sup>a</sup>Samples used for A-F Demagnetization.

TABLE 1 - *Continued*

Hole	Core	Section	Sampled at (cm)	Depth Below Sea Floor (m)	NRM			50 oersted		
					Decl.	Incl.	Intensity (emu/gm) × 10 <sup>-5</sup>	Decl.	Incl.	Intensity (emu/gm) × 10 <sup>-5</sup>
9	10	1	100-103	311.6	56.9	72.5	0.4000	47.0	-57.8	0.25500
9	10	2		312.9	257.2	78.3	0.0407	303.1	60.5	0.01170
9A	1	5	18-21	684.8	161.0	-10.0	8.8300	159.7	-16.1	6.13000
9A	2	1	140-142	759.6	81.9	58.5	7.1800	68.9	37.2	1.47000
9A	3	1	82-84	765.7	163.4	77.4	14.4000	111.6	61.7	1.63000
9A	3	4	134-136	770.7	325.7	70.4	14.5000	30.2	57.2	2.73000
10	1	2	13-15	31.5	186.6	-28.9	1.0800	211.8	-76.0	0.5360
10	2	2	12-14	41.8	126.1	51.1	0.6240	14.9	46.3	0.4110
10	2	2	78-80	42.5	166.9	76.4	0.4950	177.1	70.1	0.2340
10	2	2	129-131	43.0	209.3	63.3	1.5800	202.4	61.8	0.6920
10	2	3	13-15	43.3	153.0	32.4	1.7400	134.2	32.8	0.6250
10	2	3	49-51	43.8	117.1	87.3	0.9950	284.1	70.2	0.3960
10	2	3	99-101	44.2	126.0	24.1	1.0400	70.1	45.5	0.4220
10	2	4	5-7	44.8	184.9	-5.4	0.5430	189.3	36.6	0.2800
10	3	1	49-51	48.7	149.8	50.1	0.6320	160.4	53.0	0.4380
10	3	3	10-12	51.3	231.8	42.8	0.4920	256.1	52.0	0.2020
10	3	3	49-51	51.7	251.3	48.1	0.6770	274.1	50.0	0.4020
10	3	3	81-83	52.0	321.5	25.3	1.0500	325.8	20.7	0.4300
10	3	4	12-14	52.8	126.5	38.2	0.4370	172.4	80.9	0.1240
10	3	4	45-46	53.2	186.5	38.2	0.4850	62.4	70.1	0.1390
10	3	4	125-127	54.0	183.7	16.7	0.3630	185.9	-7.8	0.5220
10	5	1	118-120	72.5	175.0	-19.9	0.4370	192.7	-18.3	0.0852
10	5	1	127-129	72.6	275.2	-63.2	0.2100	292.4	-53.4	0.2200
10	5	2	12-14	72.9	172.3	24.9	0.2510	131.8	32.4	0.1240
10	5	2	49-51	73.3	246.9	25.5	-	288.5	26.1	-
10	5	2	74-76	73.5	196.4	10.0	0.2560	240.2	11.0	0.0880
10	5	3	49-51	74.8	213.6	-0.6	0.2020	196.1	14.1	0.1540

TABLE 1 - *Continued*

Hole	Core	Section	Sampled at (cm)	Depth Below Sea Floor (m)	NRM			50 oersted		
					Decl.	Incl.	Intensity (emu/gm) × 10 <sup>-5</sup>	Decl.	Incl.	Intensity (emu/gm) × 10 <sup>-5</sup>
10	5	4	49-51	77.3	106.5	5.9	0.0442	247.5	2.0	0.0253
10	5	5	20-22	77.5	148.6	31.1	1.1700	124.7	28.4	0.6330
10	5	5	49-51	77.8	269.4	22.8	0.4560	278.5	15.2	0.3630
10	7	1	91-93	90.4	150.4	-21.9	0.7300	158.6	-46.7	0.2900
10	7	1	110-112	90.6	193.4	49.5	1.0100	175.5	73.1	0.3980
10	7	2	40-42	91.4	41.8	52.6	0.2400	154.7	38.1	0.2640
10	7	2	49-51	91.5	234.5	25.2	0.6440	282.9	41.0	0.2210
10	7	3	2-4	92.5	160.4	51.6	0.6610	71.2	44.1	0.5250
10	7	3	49-51	93.0	183.9	52.4	1.0600	336.3	66.1	0.5470
10	7	3	80-82	93.3	187.7	45.9	1.0400	172.7	56.9	0.4420
10	7	4	8-10	94.1	129.8	27.1	1.4000	113.6	39.1	0.5190
10	7	4	49-51	94.5	134.5	32.2	1.0700	124.5	22.0	0.4240
10	7	4	72-74	94.7	204.5	13.8	1.6400	210.9	30.0	0.3460
10	9	1	45-47	176.7	191.8	15.3	0.1330	141.3	-39.7	0.1100
10	9	1	79-81	177.0	87.8	-44.9	3.3200	1.1	-51.1	0.4670
10	9	1	104-107	177.2	181.6	8.9	0.3710	197.8	-31.8	0.1590
10	9	2	20-22	177.9	194.0	20.3	0.0863	159.6	-56.3	0.0440
10	9	2	49-51	178.2	293.1	-9.9	0.2910	317.2	-29.1	0.3670
10	9	2	80-82	178.5	303.6	-65.6	-	285.7	-12.0	-
10	9	3	49-51	179.7	174.5	21.0	0.1140	116.8	9.4	0.0272
10	9	3	70-72	179.9	75.9	30.2	0.5450	110.7	-43.8	0.2090
10	10	1	108-110	292.3	282.4	47.2	0.2490	308.4	80.1	0.7920
10	11	3	20-22	380.9	125.6	-15.4	0.6200	94.5	-17.5	0.4650
10	11	3	52-54	381.2	134.1	-18.9	0.4790	125.0	-29.2	0.3990
10	11	4	5-7	382.3	221.2	-8.3	1.0200	220.7	-41.6	0.7560

<sup>a</sup>Samples used for A-F Demagnetization.

TABLE 1 - *Continued*

Hole	Core	Section	Sampled at (cm)	Depth Below Sea Floor (m)	NRM			50 oersted		
					Decl.	Incl.	Intensity (emu/gm) × 10 <sup>-5</sup>	Decl.	Incl.	Intensity (emu/gm) × 10 <sup>-5</sup>
10	12	2	14-16	388.4	143.4	51.1	0.83500	127.5	67.1	0.54000
10	12	2	50-52	388.8	238.7	30.3	1.80000	242.0	24.4	1.21000
10	12	3	8-10	389.9	63.6	32.8	0.94000	53.9	27.9	0.74700
10	12	3	49-51	390.3	314.7	15.8	1.39000	319.0	21.4	0.91900
10	12	3	68-70	390.5	89.5	53.4	1.44000	74.2	49.1	0.89900
10	12	4	12-14	391.4	124.6	41.7	1.31000	114.9	47.8	0.80200
10	12	4	49-51	391.8	303.8	38.0	1.12000	309.5	26.0	0.78300
10	12	4	75-77	392.1	252.2	57.0	0.58900	290.0	63.9	0.39000
10	13	1	120-122	397.1	67.3	46.6	1.08000	45.5	41.9	0.66900
10	13	2	155-157	397.5	334.9	45.8	0.86600	355.4	37.2	0.66200
10	13	3	315-317	399.1	214.9	32.5	0.88900	226.3	32.5	0.49200
10	14	2	50-52	407.0	281.1	-25.8	1.00000	294.4	-15.0	0.55600
10	16	3	121-123	427.4	324.3	-58.6	0.73300	333.0	-42.7	0.54600
10	17	2	75-77	434.6	194.1	39.9	0.92600	190.6	32.4	0.51200
10	17	3	4-6	435.3	206.5	29.4	0.70600	210.3	22.3	0.30700
10	18	5	2-4	447.4	120.1	35.2	0.54700	115.8	31.3	0.28300
10	18	5	50-52	447.9	123.3	53.1	0.52500	107.4	39.3	0.29800
12B	1	1	32-34	110.3	159.2	30.1	0.01000	157.5	31.0	0.00581
12B	2	1	128-130	157.1	228.9	-33.3	0.02180	220.7	-49.9	0.01240
12B	2	2	16-18	157.5	268.6	-59.9	0.07650	274.6	-51.0	0.05520
12B	2	2	45-47	157.8	162.8	30.4	0.00753	219.7	-24.8	0.01140
12C	5	2	10-12 <sup>a</sup>	43.4	157.5	31.7	0.97500	118.3	45.1	0.27800
12C	5	2	74-76	44.0	40.0	26.9	0.62000	37.8	26.2	0.47100
12C	5	3	12-14	44.9	172.1	22.1	0.75200	191.3	83.7	0.11500
12C	6	1	110-112	52.0	201.4	41.8	0.61500	141.3	-5.2	0.15400

<sup>a</sup>Samples used for A-F Demagnetization.

TABLE 1 - *Continued*

Hole	Core	Section	Sampled at (cm)	Depth Below Sea Floor (m)	NRM			50 oersted		
					Decl.	Incl.	Intensity (emu/gm) $\times 10^{-5}$	Decl.	Incl.	Intensity (emu/gm) $\times 10^{-5}$
12C	6	2	10-12	52.5	240.4	21.8	1.50000	248.9	5.7	0.81000
12C	8	1	75-78	70.0	165.3	24.0	0.89300	126.5	34.8	0.13300
12C	9	1	127-129	79.7	174.9	20.5	1.45000	162.4	26.8	0.06940

TABLE 2. A-F DEMAGNETIZATION RESULTS

Hole	Core	Section	Sampled at (cm)	Peak Field in Oersteds	Intensity (emu/gm) × 10 <sup>-5</sup>	Decl.	Incl.
8	2	1	100	NRM	0.516	110.5	35.1
				50	0.240	85.4	21.0
				100	0.159	94.1	15.1
				150	0.122	102.8	21.2
				200	0.130	94.6	21.6
8A	1	1	102	NRM	0.387	292.5	-8.1
				50	0.383	298.5	-5.6
				100	0.374	294.7	-8.0
				150	0.281	338.2	-11.0
				200	0.0990	283.3	-45.2
9	7	4	74-76	NRM	1.36	243.4	-26.8
				50	1.43	251.8	-40.4
				100	1.18	250.5	-41.9
				150	1.01	255.3	-40.4
				200	0.639	250.9	-34.0
10	11	3	20-22	NRM	0.620	125.6	-15.4
				50	0.465	94.5	-17.5
				100	0.352	89.8	-14.9
				150	0.211	84.6	-18.5
				200	0.156	92.1	-16.2
12B	1	1	32-34	NRM	0.0100	159.2	30.1
				50	0.00581	157.5	31.0
				100	0.00617	216.0	-15.0
				150	0.00648	127.6	-19.7
				200	0.00426	176.4	-11.8
12C	5	2	10-12	NRM	0.975	157.5	31.7
				50	0.278	118.3	45.1
				100	0.167	87.8	36.7
				150	0.163	85.8	27.1
				200	0.185	73.1	9.4

Figures 1 through 6: Demagnetization curves for samples from Leg 2.

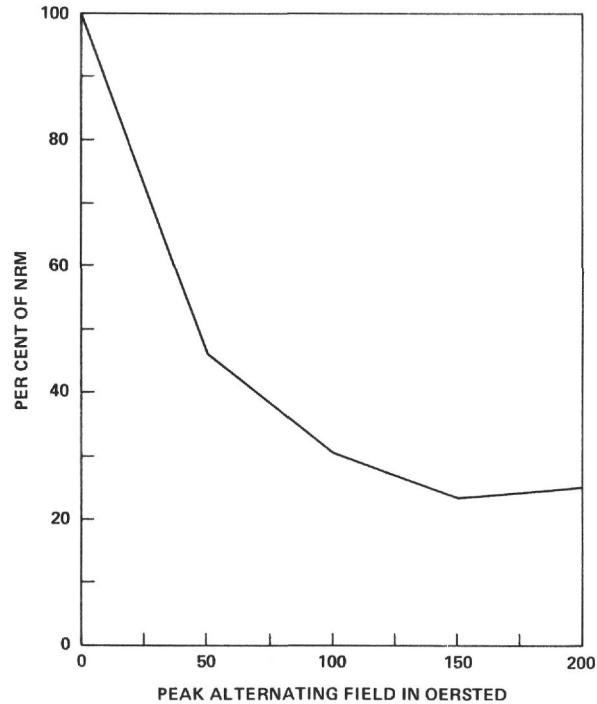


Figure 1. 2-8-2-1, depth 100 cm.

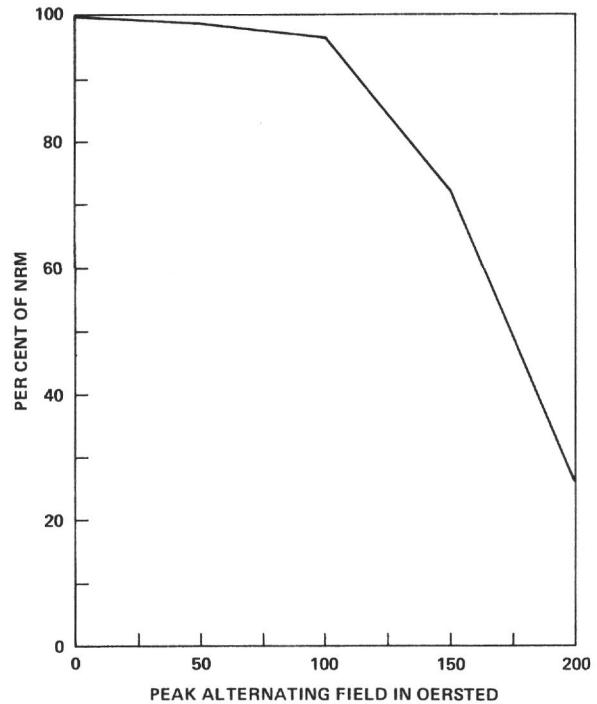


Figure 2. 2-8A-1-1, Depth 102 cm.

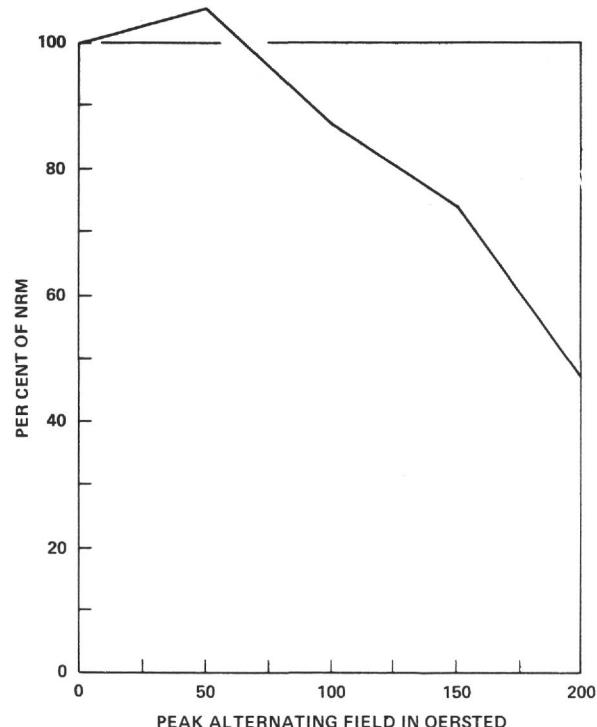


Figure 3. 2-9-7-4, Depth 74-76 cm.

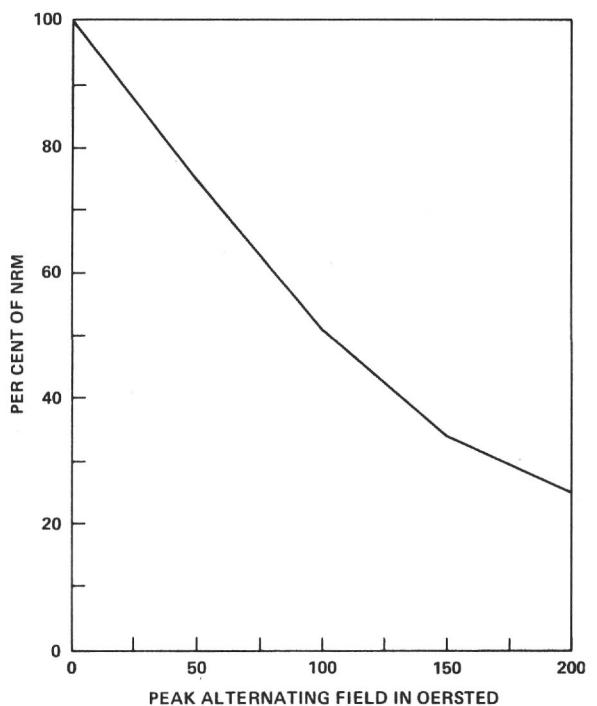


Figure 4. 2-10-11-3, Depth 20-22 cm.

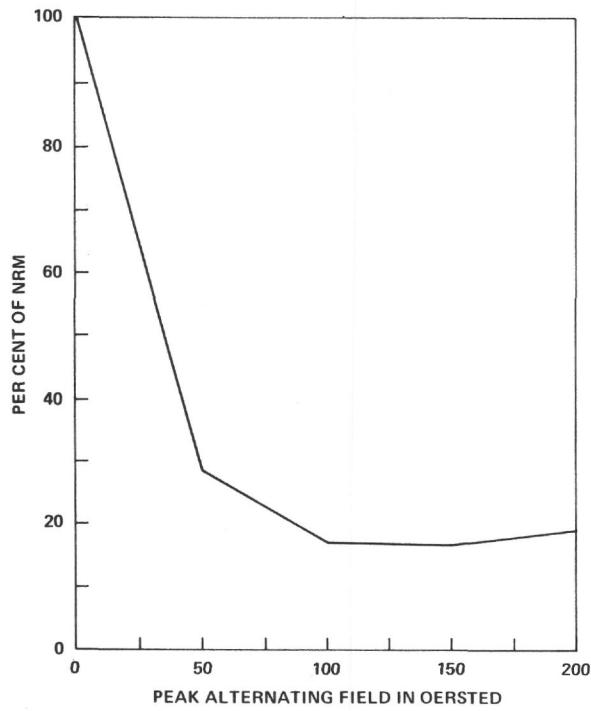


Figure 5. 2-12B-1-1, Depth 32-34 cm.

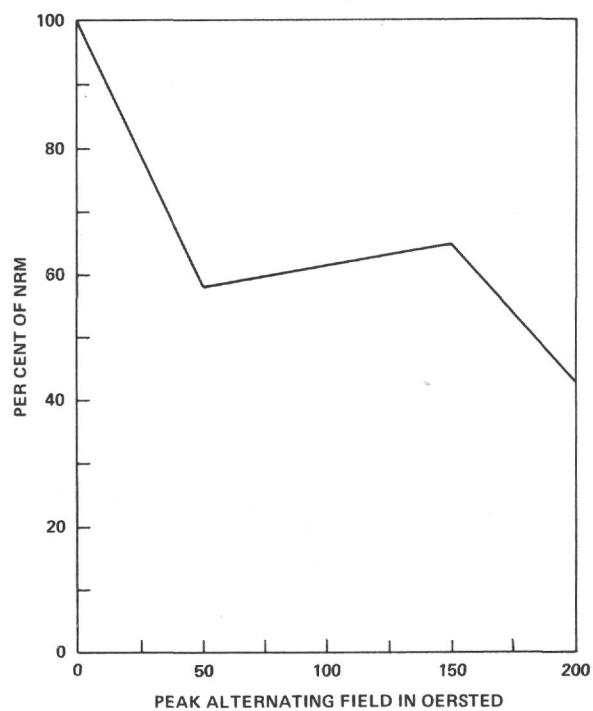


Figure 6. 2-12C-5-2, Depth 10-12 cm.

Figures 7 through 10: Paleomagnetic reversed stratigraphy  
for Sites drilled on Leg 2.

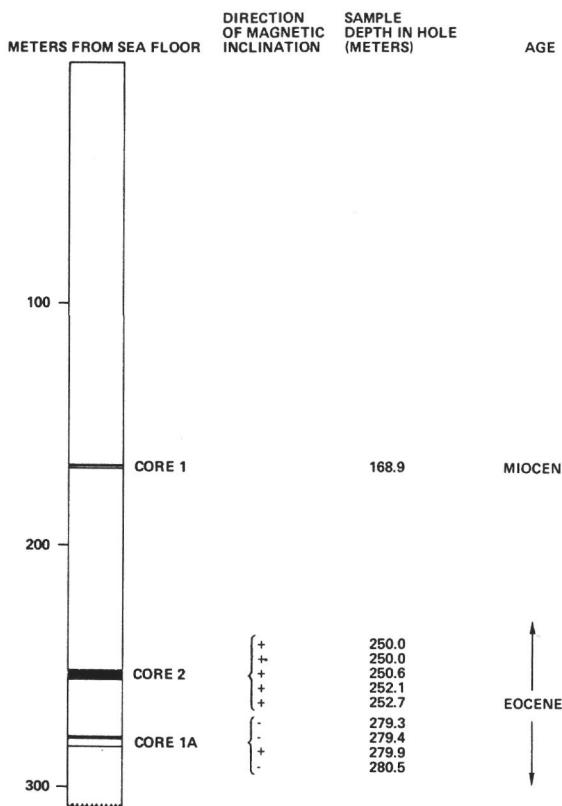


Figure 7. Holes 8 and 8A.

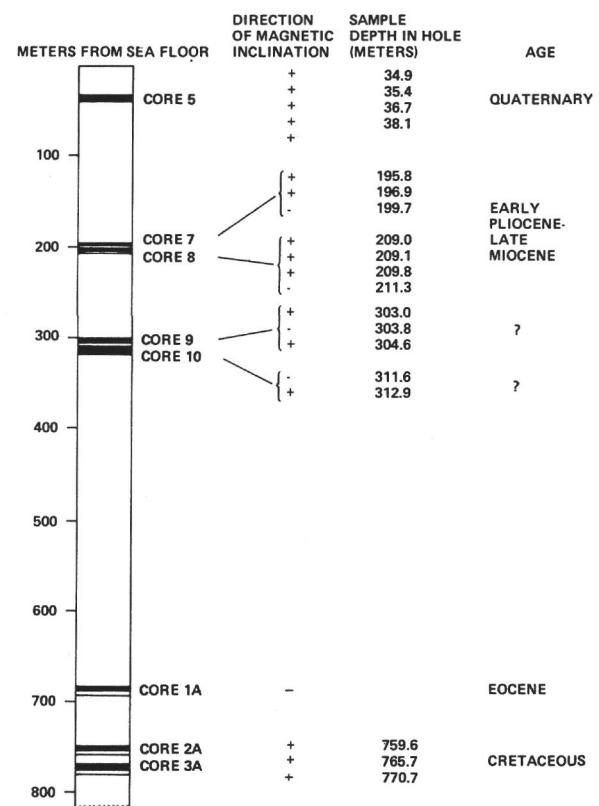


Figure 8. Hole 9.

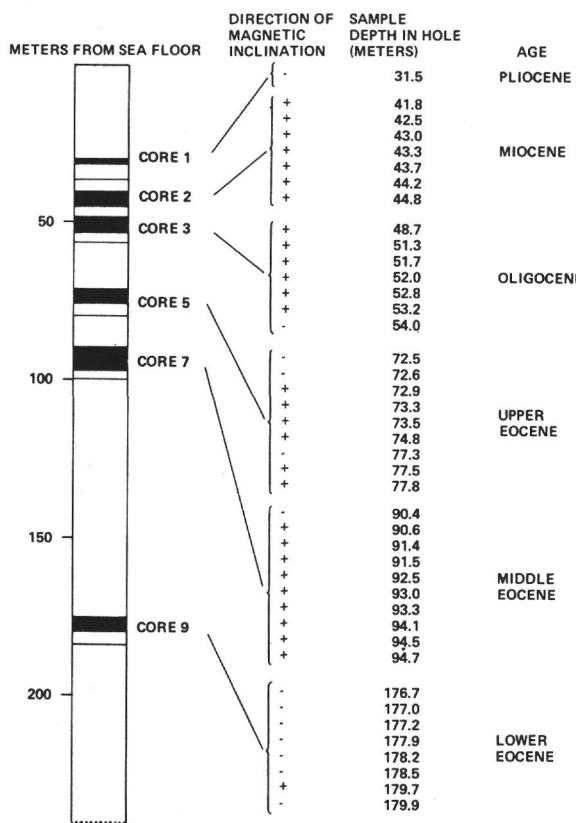


Figure 9. Hole 10.

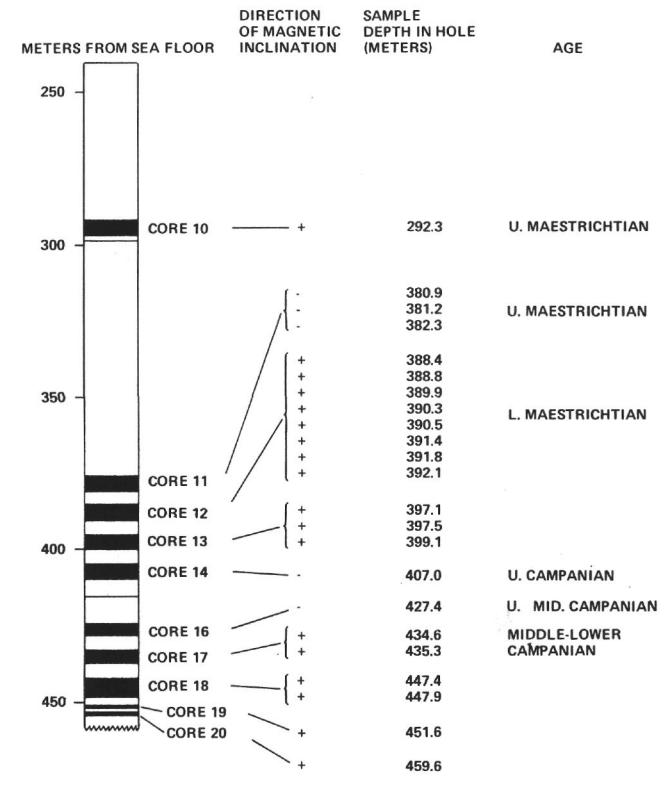


Figure 9. Continued

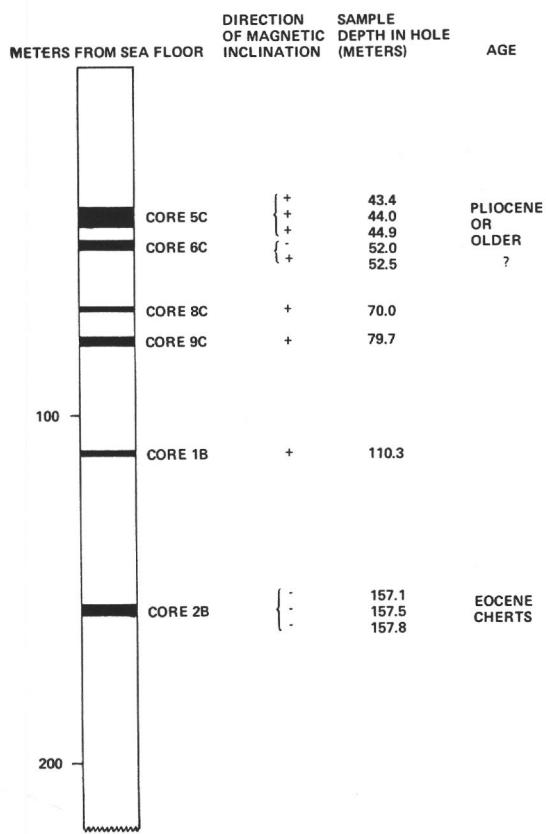


Figure 10. *Holes 12B and 12C*