CURATORIAL NEWSLETTER	DATE: July 6, 1981	NO: 32
	D P Blanchard	
	DOUGLAS P. BLANCHARD, LUNAR SAMPLE CURATOR CURATORIAL BRANCH, SN2, NASA/JSC HOUSTON, TEXAS 77058, 713-483-3274	

New Curator and New Laboratory Manager Named

On May 31, Doug Blanchard was announced as the new Curator. Doug is a geochemist and, as the principal investigator in the JSC neutron activation and x-ray flourescence labs, has been active in the lunar sample program. Doug was the Contamination Control Officer during Pat Butler's curatorship and was heavily involved in the construction and operational readiness phases of the new lunar sample building.

Steve Waltz has been named as Northrop Services Inc. Laboratory Manager for the Lunar Curatorial Lab. He replaced Chuck Simonds who has taken a position with an oil exploration company. Steve has worked in the curatorial laboratory for the past eight years working as a sample processor, lunar core processor, lunar laboratory supervisor, and now as laboratory manager. Steve has been instrumental in establishing the computer-based inventory and sample control programs and procedures.

The staff of the curatorial branch and the Northrop staff deserve special recognition for the productive and responsive operation of the curatorial facilities during this period of change.

LAPST met in May, meets again in August

The Lunar and Planetary Sample Team (LAPST) met at the Lunar and Planetary Institute (LPI) from the 14th through the 17th of May. In response to specific requests, the LAPST recommended the allocation of 198 samples to 10 Principal Investigators (PI's). Most of the studies are concerned with the Highland's Initiative and involve samples from the Apollo 16 sample suite. Several requests were for samples from double drive tube 64001/2, which is just now being processed.

The next LAPST meeting will be near the end of August. Please submit lunar sample requests to this office no later than August 15. Requests received past this date will not be considered until the November LAPST meeting. LAPST members and LAPST advocates for PI's are included in this newsletter for your information.

Work on Core 64002 progresses, other core issues raised

The first two dissection passes of 64002 have been completed and the core synopsis is included in this Newsletter. The second dissection pass provides the minimum contamination/bulk soil samples. The third dissection pass should be completed by the end of the summer, and the continous polished thin sections ready by October 31, 1981. There is now one processor (J. S. Nagle) in the Core

Laboratory. The rate of dissection of unopened core tubes is one double drive tube per year. This rate seemed reasonable to LAPST. Please communicate your feelings to the Curator.

Two other core topics also need to be considered. There are core samples in Remote Storage. Which of these cores, if any, should be opened and when is a question now open for discussion and comment to LAPST members and the Curator. The second topic concerns the several core samples that were vacuum-sealed on the Moon and have been maintained in vacuum ever since. Discussion of special experiments or opening and dissection procedures for these special cores should also be directed to LAPST members or the Curator.

The long-awaited catalog on the 60009/10 core will be printed sometime this fall. The final draft is being prepared this summer.

Status and Future of Cores

Opened and dissected cores

10004	14230
10005	15008
12025	15010
12028	15011
12026	60009
12027	60010
14210	74001
14211	74002
14220	76001

Drill cores

15001 - 15006
60001 - 60007
70001 - 70009

Unopened cores and projected dissection dates

15007	December 1981
15009	March 1983
60013, 60014	in Remote Storage
64001	February 1982
64002	August 1981
68001, 68002	both by November 1982
69001	in Remote Storage (vacuum-sealed)
70012	app. 1984
73001	vacuum-sealed
73002	in Remote Storage
79001, 79002	September 1983

Lunar Sample Catalog Work Continues

The following catalogs are being prepared by or for the Curator's office.

- Soils Catalog (R. Morris)
- Apollo 16 2-4mm Catalog (includes about 40 generic samples) (M. Norman)
- 66055 Guidebook (G. Ryder)
- Apollo 15 Rock Catalog (G. Ryder)
- Introduction to the Apollo 16 Core Samples (J. Allton)
- 60009/10 Catalog (R. Fruland)

67016 Guidebook (M. Norman) is finished and available from the Curator's Office. The Apollo 16 Workshop report (F. Horz and O. James) will be ready soon. The LPI will distribute this workshop report.

G. Ryder would be interested in receiving any unpublished data on Apollo 15 samples for the Apollo 15 Rock Catalog. This catalog will be similar in scope to the Catalog of Apollo 16 Rocks (in 3 volumes) by Ryder and Norman.

Highlands Initiative Matures, More Workshops Planned

A workshop on "Magmatic Processes in the Formation of Early Planetary Crusts" will be held in Billings, Montana, August 3-7. The workshop will explore the analogies between pristine cumulate rocks of the lunar highlands and rocks of terrestrial stratiform layered intrusions.

The workshop on "Comparisons between Lunar Breccias and Soils and their Meteoritic Analogues" will be held November 9-11, 1981 at the LPI. Wilkening and J. Taylor are the co-conveners. All the keynote speakers and discussion leaders have been lined up. The first day will be devoted to observational data of lunar and meteorite breccias and of asteroidal surfaces. The second day will concentrate on processes involved in regolith formation and evolution and models for these processes. The third day will feature discussions of future research directions and opportunities for collaborative research.
More information on these workshops and other topics concerned with the Highlands Initiative are contained in the Lunar Highlands Newsletter.
If you would like to receive that newsletter notify the Curator's Office and we'll include you on the mailing list.

Vigorous Antarctic Meteorite Program Continues

The 103 meteorites returned to JSC from the 1980 collecting season are being unpacked and examined in the meteorite processing lab. Continued examination work and allocations should be completed in time for the next Meteorite Working Group meeting scheduled for September 12-14 in Washington D.C.

Preparations are being made for John Annexstad's Antarctic trip, the fourth as part of the exploration and meteorite collection team and eighth overall. This years' effort will see an expanded glaciological investigation in which John will play a leading role. These measurements are clarifying our understanding of the processes that concentrate meteorites in certain areas of Antarctica.

If you do not already receive the Antarctic Meteorite Newsletter and would like to, please notify the Curator's Office and we will add you to the mailing list.

Cosmic Dust Collects Inspite of Aircraft Problems

After an impressive effort by Uel Clanton and the NSI staff, the NASA RB57 took off on schedule with eight cosmic dust collectors in place on May 8, 1981. Unfortunately a procedural problem caused the airplane to land with the collectors open. That problem was easily remedied and new collectors were installed. These collectors have accumulated about 40 hours of collection time at altitude. The present set of collectors are due to be changed out in mid July. The next set will then fly until late September.

Meanwhile work on the JSC ultraclean facility to clean collectors and process cosmic dust is progressing well. Building 31 modifications are being made to install the clean tunnel which has already been delivered. We are quite confident that the ultraclean facility will be operational by mid-August.

With this good news is serious bad news. As of September 31, NASA's RB57 will no longer fly; it will be phased out with many of its mission activities transferred to NASA's new ER-2 aircraft at Ames. We are negotiating with Ames to support our cosmic dust collection efforts but the situation is not well enough defined to predict an outcome.

Our present options for continued collection are these:

1. Piggy back our present RB57 collectors on another RB57 that will continue to fly out of Ellington (JSC) exclusively for the DOE. This aircraft flies less often and for shorter duration but we could expect to accumulate about 100 hours of collection time per year.

2. Move ahead with design and fabrication of "pie pan" collectors (much larger surface area) for the RB57 assuming that the DOE flights will continue. We would get the same 100 hours/year but with great improvement of collection efficiency.

3. Use the wingtip collectors (4) on the Ames U-2 aircraft (flying schedule uncertain) that will be vacated when the Ames moves their aerosol collectors to the ER-2. Total collection time is very uncertain.

4. Design collectors for use on the ER-2. This is the long lead time, expensive option.

We are moving ahead with options 1 and 2 and anticipate that we will maintain some reasonable level of collection time. We are presently working with Ames to explore options 3 and 4.

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ADVOCATE LIST FOR 1981 PIs

MINERALOGY AND PETROLOGY

O. JAMES	D. WALKER	F. HÖRZ	J. TAYLOR
Albee	Arnold	Andre(Adler)	El Goresy
Buseck	Goldstein	Basu	Hafner
Hays	Lofgren	Englehardt	Hubbard
Huebner	Meyer	James	Weiblen
Keil	Rutherford	Maurette	
Lindsley(Bence)	Smith	McDonnell	
McKay	Tatsumoto	Papike	
Phinney	Tilton	Ringwood	
Roedder	Wasserburg	Stöffler	
Sato	Weill	Taylor, L.	
Wood		Takeda	

ISOTOPES AND CHEMISTRY / PHYSICAL PROPERTIES

D. BROWNLEE	W. BOYNTON	TO BE NAMED	R. MORRIS
Clayton	Anders	Bhandari	Adams
Epstein	Blanchard	Blanford	Ahrens
Geiss	von Gunten	Fireman	Brownlee
Gibson	Haskin	Hohenberg	Dollfus
Heymann	Laul	Lal	Fuller
Kaplan	Morgan	Marti	Hapke
Kirstein	Nyquist	Philpotts	Hörz
Pepin	Reynolds	Pillinger	Housley
Perkins	Schmitt	Signer	Klein
Rhodes	Wanke	Taylor, S. R.	Reed
Thode	Wasson	Tombrello	Schaeffer
		Walker, R.	Simmons
			Strangway
			Turner
			Runcorn

LAPST SUBCOMMITTEES

CORE	RESTRICTED ACCESS COLLECTION AND CUTTING PLANS	PUBLIC DISPLAYS AND EDUCATION	PROCEDURES AND LABORATORY
R. MORRIS	J. TAYLOR	D. WALKER	W. BOYNTON
F. Hörz	O. James	O. James	D. Brownlee
D. Walker	R. Morris	F. Hörz	

COSMIC DUST	HIGHLANDS INITIATIVE
D. BROWNLEE	O. JAMES
W. Boynton	F. Hörz
U. Clanton	R. Morris
F. Hörz	D. Walker

FIRST DISSECTION OF CORE 64002, A SYNOPSIS

J. H. Allton

7/1/81

Sample Number: 64002, top half of a double, 4 cm drive tube (64002/64001)

Field Relationships: Core 64001/2 was collected at Station 4, the highest station on Stone Mountain. The surface slope is about 16^0 on a 100 m scale (1). The local slope for 64001/2 was influenced by the core being taken, on the downslope side, 7-8 m from the rim of a subdued, shallow crater of 15 m diameter. The regolith was gray in color. In the crater, white soil was observed at 1 cm depth, and none was found in a trench in the bottom of the crater. A soil penetrometer test taken adjacent to the core indicated relatively dense soil to 27 cm depth underlain by softer soil (2).

Sample History: Astronauts neglected to insert the keeper in the top end of the core (2), thus, the top of the core may have been free to move slightly. X-radiographs taken in May, 1972, after the keeper was set, reveal a partial void along one side of the tube, as might occur from horizontal storage, from 26 cm to the bottom of core. The top of the core showed no void space at this time. No voids were evident after extrusion. The first dissection and description in this synopsis was done by J.H. Allton. Subsequent dissections and descriptions and the tables of sample numbers was (will be) done by J.S. Nagle.

Weight, Length, Density:

	Before opening tube	After extrusion
Weight	584.1 g	
Length	31.7 cm	26.4 cm
Density	1.38 to 1.40 g/cm^3(2)	1.65 g/cm^3

Summary of Stratigraphic Units Identified During Dissection by Classification of >1 mm Fragments:

Classification scheme is given in Table 1. Abundance data related to Table 2.

0.0 - 4.0 cm Homogeneous medium brown-gray (Munsell color 5Y 4/1). Lowest density unit, has lowest abundance of soil breccias, and highest abundance of the hardest fragments: dark matrix breccias and gray crystallines.

4.0 - 9.0 cm Homogeneous medium brown-gray (Munsell color 5Y 4/1). Medium density, coarsest unit. Unit has greatest abundance of soil breccias and splash glass.

9.0 - 12.5 cm Homogeneous medium brown-gray (Munsell color 5Y 4/1). Medium density, finest grain unit with high abundance of dark matrix breccias.

12.5-19.7 cm Light gray (Munsell color 5Y 5/1). Contains cm-size white, gray, and dark brown marbled soil clasts and small more distinct white soil clasts. Two distinctive brown soil clasts were associated with dark brown glass fragments. Clasts were small, 2-3 mm diameter. Most dense unit with greatest abundance of anorthosite. Textural boundary exists at 16.0 cm. Soil above 16 cm appears more massive because the large marbled clasts are diffuse. Below 16 cm more coarse particles are found, and the matrix has more 100-500 μ size white fragments. The large soil breccias found in the bottom of this unit are light gray and fine grain and do not appear to be lithified *in situ*. Unit contains lowest abundance of glass.

19.7-26.4 cm Homogeneous medium to dark brown-gray (Munsell color 5Y 4/1) with a few small white clasts near 23 cm. Color and fabric boundary at 23 cm defined by these white clasts and slightly darker soil above 23 cm. Medium dense unit with low abundance of glass and high abundance of light matrix breccia due to large fragment at bottom of core.

Special Features:

1. From 5-7 cm 86% of the splash glass coated soil breccias of greater than 3 mm diameter were oriented with the glassy face upward. There was a concentration of these glassy fragments at 5.5-6.0 cm.

2. Close correlation of abundance of fresh anorthosite and shiny, soil-free glass chips, shown in Figure 2, suggests both species have a common source.

References:

(1) Lunar Topophotomap 78D2S1
(2) Apollo 16 Prelim. Sci. Rep., 1972, sections 6,7, 8.

Table 1. Scheme used to classify fragments >1 mm

GROUP	SUBGROUP (description)	NEAREST STÖFFLER CLASSIFICATION
ANORTHOSITE	Fresh Crystals (crystal cleavages, usually translucent) Shocked (chalky appearance, vitrification)	
LIGHT MATRIX BX	(shocked plagioclase with dark inclusions)	Fragmental Bx
DARK MATRIX BX	Aphanites (dark colored, non-glassy, but homogeneous and fine-grained) Glassy Matrix with Clasts	Crystalline Melt Bx " " "
SOIL BX	Light gray compacted soil Dark gray compacted soil	Regolith Bx " "
GLASS	Glass-coated soil Vesicular glass fragments	Impact Glass " "
GRAY CRYSTALLINE	(coherent, angular, matte finish, sugary)	Crystalline Melt Bx (without clasts)

Table 2. Summary of lithic classification data by unit.

Depth of unit	g/cm length of core	g soil >1mm per gram soil	g soil bx per gram soil	g glass per gram soil	g anorthosite per gram soil	g light mx bx per gram soil	g dark mx bx per gram soil	g gray xtl per gram soil
0.0 - 4.0 cm	4.10	.169	.039	.039	.010	.005	.027	.044
4.0 - 9.0 cm	4.45	.271	.193	.046	.003	.009	.009	.011
9.0 - 12.5 cm	4.71	.077	.033	.007	.002	.003	.026	.005
12.5 - 19.7 cm	4.97	.139	.081	.006	.016	.008	.017	.013
19.7 - 26.4 cm	4.77	.094	.049	.006	.007	.019	.011	.001

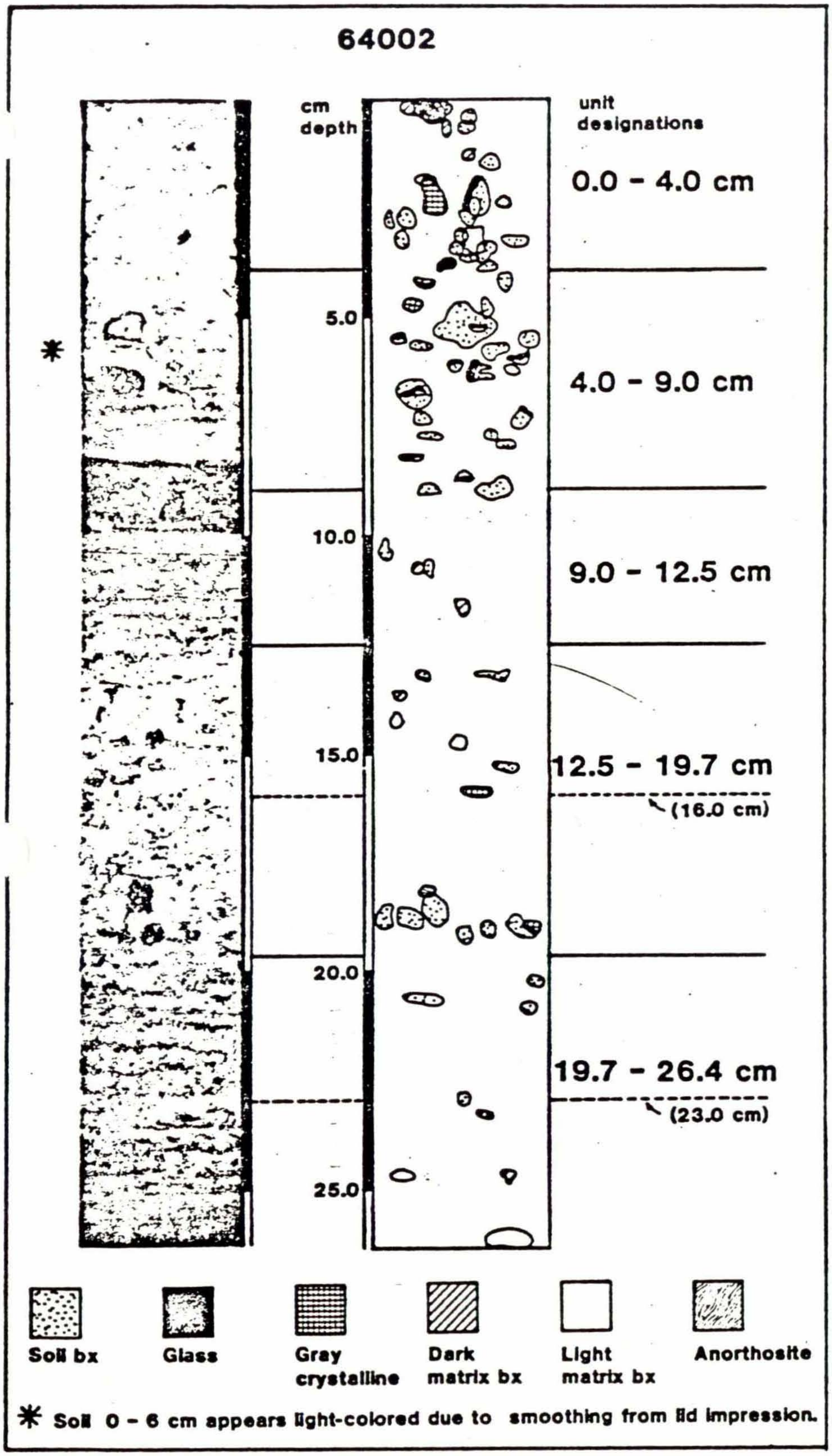


Figure 1. Photograph of core surface after first dissection and location of rocks greater than 3 mm.

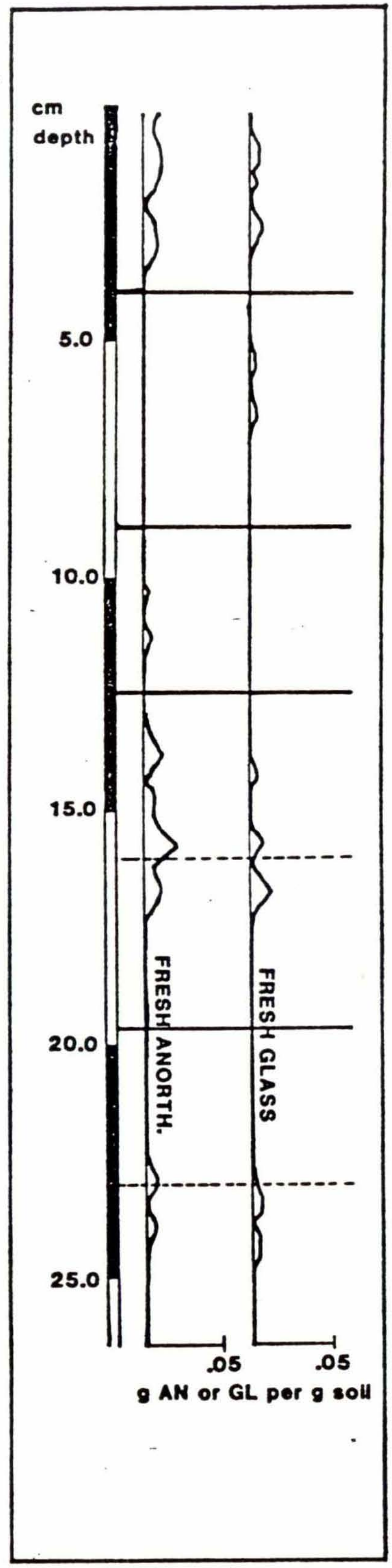


Figure 2. Correlation of weight abundance of fresh anorthosite and fresh, soil-free glass with depth in core.

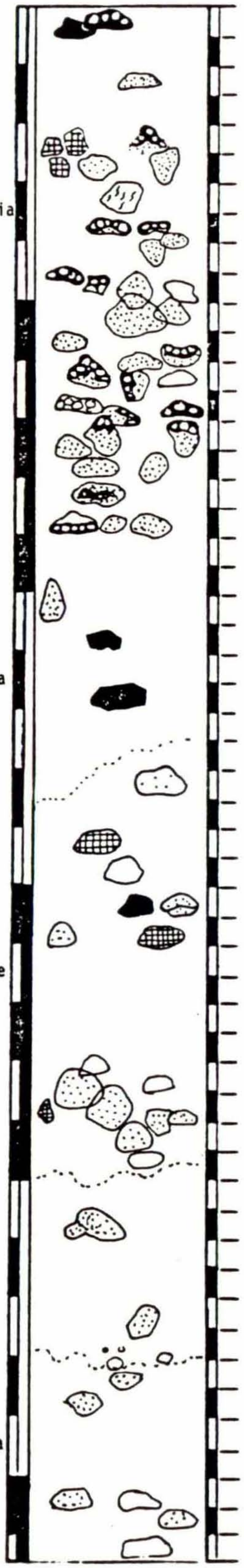
INTERVAL SAMPLES, FIRST DISSECTION OF CORE 64002

Lithologic Units

DARK MASSIVE ZONE
- Rel. Fine
- Coarse, rich in soil breccia and vesicular glass
- Rel. fine
- Rel. fine, rich in dark matrix breccia

LIGHT MARBLED ZONE
- Much hard lt. matrix breccia
- Mostly friable chalky, white (cat. An.?) breccia
- Much light soil breccia

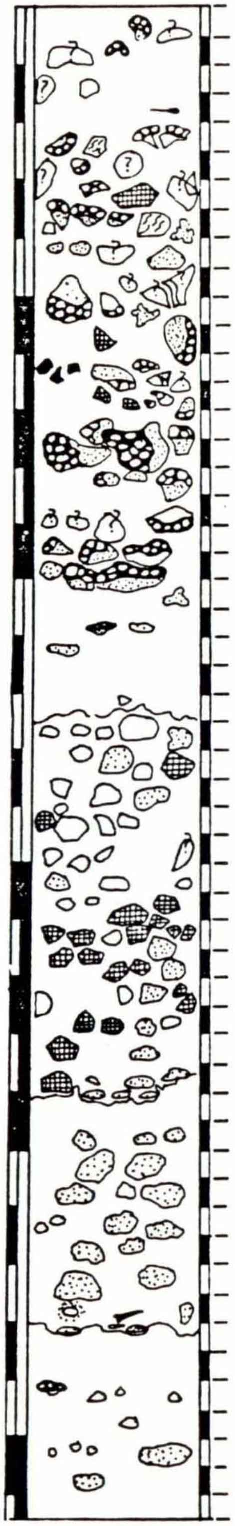
DARK MASSIVE ZONE
- Much soil breccia
- Increase in hard light matrix breccia



Depth cm	Sample No.	Sample Wt.	Sample No.	Sample Wt.	
0.0	See "Special Samples"		for details of top 5 mm		
0.5	,12	2.609	,13	0.179	
1.0	,14	1.256	,15	0.167	
1.5	,16	1.961	,17	0.142	
2.0	,18	1.527	,19	0.621	
2.5	,20	1.753	,21	0.434	
3.0	,22	1.571	,23	0.625	
3.5	,24	1.733	,25	0.252	
4.0	,26	1.432	,27	0.450	
4.5	,28	1.185	,29	0.410	
5.0	,30	1.625	,31	0.374	
5.5	,33	1.692	,34	0.628	
6.0	,35	1.714	,36	0.769	
6.5	,37	1.643	,38	0.329	
7.0	,40	1.595	,41	0.484	
7.5	,42	1.606	,43	0.346	
8.0	,44	1.897	,45	0.195	
8.5	,46	1.682	,47	0.432	
9.0	,48	2.124	,49	0.204	
9.5	,50	2.290	,51	0.153	
10.0	,52	2.220	,53	0.177	
10.5	,54	2.091	,55	0.235	
11.0	,56	2.189	,57	0.108	
11.5	,58	2.060	,59	0.287	
12.0	,60	2.231	,61	0.078	
12.5	,62	2.046	,63	0.121	
13.0	,66	2.333	,67	0.318	
13.5	,68	2.350	,69	0.287	
14.0	,70	1.887	,71	0.383	
14.5	,72	1.726	,73	0.325	
15.0	,74	1.870	,75	0.375	
15.5	,76	2.171	,77	0.446	
16.0	,78	2.112	,79	0.193	
16.5	,80	2.152	,81	0.262	
17.0	,82	2.432	,83	0.269	
17.5	,84	1.978	,85	0.258	
18.0	,86	2.186	,87	0.251	
18.5	,88	2.172	,89	0.661	
19.0	,90	1.650	,91	0.137	
19.5	,92	1.107 lt.	,93	0.144 lt.	,94 (1.402) ,95 (0.119) dark half
20.0	,99	2.117	,100	0.202	
20.5	,101	1.957	,102	0.242	
21.0	,103	2.388	,104	0.144	
21.5	,105	2.034	,106	0.184	
22.0	,107	2.528	,108	0.155	
22.5	,109	2.141	,110	0.240	
23.0	,111	2.063	,112	0.187	
23.5	,113	2.043	,114	0.201	
24.0	,115	2.537	,116	0.174	
24.5	,117	2.246	,118	0.189	
25.0	,119	2.208	,120	0.214	
25.5	,121	2.013	,122	0.126	
26.0	,123	1.386	,124	0.150	
26.4					

J. S. Nagle
July 1, 1981

SAMPLE LOCATIONS, 2ND DISSECTION, CORE 64002



Depth (cm)	Sample No.	Sample Wt.	Sample No.	Sample Wt.	Sample Type (Special Samples)
0.0	1006	2.342			
0.5	1007	2.604			
1.0	1008.	2.645			
1.5	1009	2.515			
2.0	1010	2.682			
2.5	1011	3.299			
3.0	1012	2.767			
3.5	1013	2.094			
4.0	1014	2.743			
4.5	1015	2.346			
5.0	1016	2.240			
5.5	1017	1.931			
6.0	1018	2.390			
6.5	1019	2.287			
7.0	1020	2.666	1021	0.886	rock fragments
7.5	1022	2.417			
8.0	1023	2.098			
8.5	1024	2.441			
9.0	1025	2.125			
9.5	1026	2-831			
10.0	1027	2.269			
10.5	1028	2.617			
11.0	1029	2.329			
11.5	1030	2.292			
12.0	1031	2.662			
12.5	1032	2.415			
13.0	1033	2.909			
13.5	1034	3.030			
14.0	1035	2.372			
14.5	1036	2.752			
15.0	1037	2.948			
15.5	1038	2.317			
16.0	1039	2.819			
16.5	1040	3.812			
17.0	1041	2.580			
17.5	1042	2.657			
18.0	1043	2.839			
18.5	1044	2.653			
19.0	1045	3.043			
19.5	1046	2.768			
20.0	1047	2.875			
20.5	1048	2.596			
21.0	1049	3.303			
21.5	1050	2.889			
22.0	1051	2.790			
22.5	1052	2.818			
23.0	1053	3.052			
23.5	1054	2.977			
24.0	1055	2.922			
24.5	1056	2.909			
25.0	1057	2.865			
25.5	1058	2.436			
26.0	1059	2.369			
26.4					

base Of 64002, section continued into 64001

J. S. Nagle
July 1, 1981