CURATORIAL NEWSLETTER	DATE: April 26, 1979 NO. 23
	Patrick Butler Jr
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ATTACHMENTS

Core Snynopses - 14210/14211 and 76001

REQUESTS FOR SAMPLES

The next meeting of LAPST will start May 17 and the following meeting is scheduled for August 16. Send sample requests to the Curator as soon as possible so that background information can be assembled before the meeting begins. Include your schedule for starting studies on the requested sample so we can plan processing of the allocations. Even if your schedule is not tight, please include it for our guidance.

LUNAR HIGHLANDS NEWSLETTER

Nearly 700 copies of Volume 1, No. 2 were mailed last week. Write if your copy did not arrive. This issue consists of 31 pages with information on the supplemental suite of rocks, the reference soils, and on the allocations for highlands studies made in February 1979.

FOUR ROCKLETS FROM LUNA 16, 20 AND 24

Representatives from the Academy of Sciences, U.S.S.R., delivered four fragments of igneous rocks from the Luna missions for the specified purpose of obtaining ages by the Sm-Nd method. Requests are invited for coordinated studies to develop the maximum possible information on these samples (described below) in conjunction with the dating studies. These samples will not be allocated until state-of-the-art methods are well enough advanced to give some assurance of successful determinations.

Sample No.	Landing Site	Sample No.	Weight (mg)	Description	Comments
		Data Supplied by the Academy of Sciences, U.S.S.R.*			
21025,0	Luna-16	1611-028	29.8	Dark, fine grained basalt	--
22014,0	Luna-20	2004-011	38.5	Anorthositic, recrystallized rock	On surface there are traces of oxidation in Earth's atmosphere.
24067,3200	Luna-24	24067,3-002	67.2	Vesicular, coarse grained basalt (gabbro)	Different from sample 24170
24067,3800	Luna-24	24067,3-008	30.9	Micro gabbro, of pinkish group color	Proposed to be from a dike rock.

*Translation by N. Hubbard of a document that accompanied the four Luna samples delivered to M. Duke by V. L. Barsukov March 20, 1979.

OBSERVATIONS BY M. NORMAN*

Luna 16 - 21025,0 (originally 1611-028) - dark, fine grained mare basalt. Grain size less than ∿0.1 mm.

Luna 20 - 22014,0 (originally 2004-011) - brecciated, possibly recrystallized anorthositic fragment. Some feldspar retains original crystal faces (up to ∿0.5 mm). No traces of glass veins of any sort but numerous small spots of oxidation ("rust") similar to some Apollo 16 samples are present.

Luna 24 - 24067,3200 (originally 24067,3-002) - Coarse grained gabbroic to subophitic texture. Some plag laths present up to ∿1 mm long. Plag is ∿30-40%, similar to the finer-grained Luna 24 VLT ferrobasalts. Two mafic minerals (olivine and pyroxene) are present and are generally 0.2-0.5 mm. Opaques are rare and interstial.

- 24067,3800 (originally 24067,3-008) - Very fine grained (<0.1 mm) green-gray fragment. Described as pink-gray by U.S.S.R. Fine grained opaques can be seen and appear to be somewhat more common than the typical Luna 24 VLT (very low-Ti) rock fragments.

*Through capped silica tubes with a binocular microscope. All fragments are in one piece.

LUNAR CORES

Synopses of the dissection observations and other information on core sections 14210, 14211, and 76001 are attachments to this Newsletter. Spectral reflectance images were made of the stratigraphic remainders of these cores and the preliminary results were reported (Butler et al.,(1979), Lunar and Planetary Science X, pages 175-177).

A synopsis for 15011 is in preparation and will be distributed when finished. The last of the Apollo 12 and 14 cores, drive tubes 12027 and 14220, will be dissected this summer as the last core dissections to be done in the present laboratory. Drive tubes 15008 and 15009 will be the first cores dissected in the new Lunar Sample Building, and will be started in late summer.

LUNAR SAMPLE BUILDING

Construction will be completed early in May, at which time the curatorial staff will start a 1-1/2 month process of activation, which includes final cleaning of the pristine vault and laboratories, reinstallation of nearly 3000 feet of nitrogen gas supply and monitor piping after cleaning, installation of cabinets, and simulations and testing of all systems and operations. Following the final Operations Readiness Inspection, by a team including L. A. Haskin and B. French, as well as JSC representatives of Engineering and Safety, movement of the samples from building 31 to the new vault will start. When all of the samples have been moved, sample processing will be started in the new pristine laboratory. The tenth anniversary of landing the first humans on the Moon, July 20, will include dedication of the Lunar Sample Building as one of the observance activities at JSC. The next Newsletter in June will have more information.

CABINET ATMOSPHERES - SPECIFICATIONS

In the two previous Newsletters, No.s 21 and 22, we announced plans to raise the maximum permissible levels of O_2 and H_2O from 20 ppm and 50 ppm, respectively, to 200 ppm each if there were no objections. Two Principal Investigators have objected, however, so the possible effects of such a change will be further studied to meet all objections before any change is made. Continued investigation of the matter is worthwhile because the annual expenditure for liquid nitrogen could be reduced from $90,000 to as little as $33,000, which is the boiloff rate of the storage tank.

FEBRUARY 1979

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*Track requests to Housley

GROUP C

MACDOUGALL

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Gose	Hörz
Horai	Housley
Larsen	Klein
Runcorn	Simmons
Spetzler	Tittman
Strangway	Uhlmann

CORE SYNOPSIS

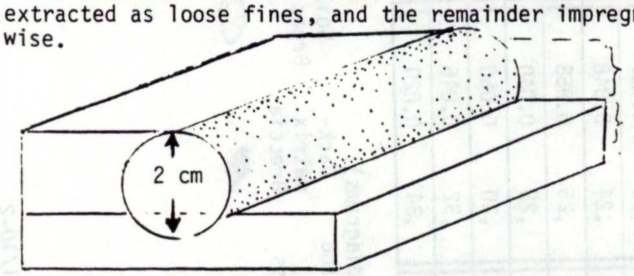
Sample No. 14211/14210, a double, 2 cm diameter drive tube

Field relationships: Core 14211/10 was collected at station A, on the smooth plains part of the Fra Mauro Formation, and at least 350 m west of the nearest ridge. The coring site was 180 m northeast of the LM, 1 km southwest from 370 m Cone Crater and off the continuous ejecta of Cone Crater. Other nearby craters include 80 m North Triplet, which is 120 m to the southeast, and three 20 m unnammed craters, with one, seen in AS14-64-9048 being relatively fresh. No other soil samples were collected at station A. Apollo 14 soils contain 10-10.5 % FeO.

Sample history - possible contamination or disturbance: Several cm of soil was lost from the junction between 14211 and 14210 during uncoupling on the moon, but the amount of missing soil is not definitely known. The cores were returned in ALSRC 1006, which sealed on the moon and held a pressure of 60 microns Hg on return. The ALSRC was opened on 12 February, 1971, in the Sterile Nitrogen Atmosphere Processing Line, and the core was kept unopened, under dry N_2 (< 25 ppm O_2, < 50 ppm H_2O) until October, 1978, when the cores were opened for dissection.

Length: (14211) 7.7 cm, Mass: 39.719 gm, Bulk Density: 1.64.
(14210) 30.0 cm, Mass: 169.70 gm, Bulk Density: 1.80.

Numbering and location of samples, Samples are numbered in order down from the lunar surface. Cores that are 2 cm in diameter are dissected in one pass, with 3/4 of the core diameter extracted as loose fines, and the remainder impregnated with epoxy and thin-sectioned lengthwise.



,1 - ,999 dissection splits (see following tables)
,1000 - ,1999 thin sections from impregnated core.

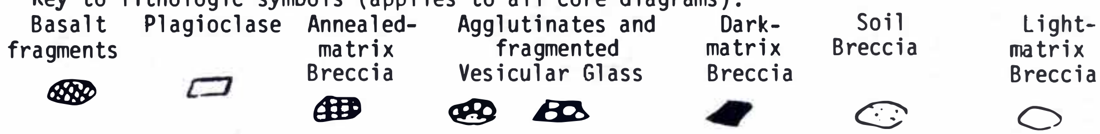
Summary of stratigraphic units identified during dissection:

Unit	Depth/samples	light/dark color	relative grain size	major petrographic components
7	0.0 - 3.5 cm ,3 - ,16	dark	fine 96% < 1mm	The coarse fraction contains abundant fused soil particles (± 70%) with dark annealed-matrix breccia also common. Fines are rich in glass.
6	3.5 - 5.0 cm ,17 - ,22 and ,35	dark	moderately fine 90% < 1mm	The top of the unit has 50% basalt and annealed-matrix breccia fragments; these are replaced down ward by fused soil components.
5	5.0 - 12.5 cm ,23 - ,34 (211) ,19 - ,36 (210)	dark	fine 96% < 1mm	Very similar to unit 7, with mostly fused soil (agglutinates, glass, dark matrix, and soil breccia), some annealed-matrix breccia.
4	12.5 - 15.5 cm ,37 - ,46	dark over light	very coarse 37% > 1mm	This unit is dominated by large agglutinates which grade downward into progressively more friable soil breccia.
3	15.5 - 19.5 cm ,47 - ,62	very light	fine 94% < 1mm	Dark annealed-matrix breccia, ropy glass and soil breccia predominate the 1mm fraction; finely divided plagioclase gives the unit a light color.
2	19.5 - 26.5 cm ,63 - ,96	light	moderately fine 89% < 1mm	Light annealed-matrix breccia and ropy glass are predominant in the coarse fraction; tiny white clasts are common in the finer sizes.
1	26.5 - 37.7 cm ,97 - ,135	light, marbled	coarser than above 86% < 1mm	Light annealed-matrix breccia and ropy glass are common, in addition to large white clasts; plag. fragments are common in the fine fraction.

DRIVE TUBE 14211: LOCATION OF DISSECTION SAMPLES

Stratigraphic Unit	Depth Below Surface	Fine (<1mm) Fraction Sample No.	Fine (<1mm) Fraction Sample Wt.	Coarse (>1mm) Fraction Sample No.	Coarse (>1mm) Fraction Sample Wt.	Special Samples Sample No.	Special Samples Sample Wt.	Special Samples Sample Type	Sample Depth
	0.5	,3	1.275	,4	0.024				
14211	1.0	,5	2.011	,6	0.059				
3	1.5	,7	1.685	,8	0.080				
(7)	2.0	,9	1.783	,10	0.079				
	2.5	,11	2.093	,12	0.128				
	3.0	,13	2.013	,14	0.092				
	3.5	,15	2.058	,16	0.092				
14211	4.0	,17	1.727	,18	0.312				
2	4.5	,19	1.908	,20	0.247				
(F)	5.0	,21	2.121	,22	0.107	,35	0.012	light soil clast	4.6-4.9
	5.5	,23	1.901	,24	0.048				
	6.0	,25	1.798	,26	0.058				
14211	6.5	,27	2.074	,28	0.040				
1	7.0	,29	1.963	,30	0.060				
(5)	7.4	,31	1.217	,32	0.046				
	7.7	,33	1.150	,34	0.020	,2	1.148	rind	0 - 7.4

Key to lithologic symbols (applies to all core diagrams):



DRIVE TUBE 14210: LOCATION OF DISSECTION SAMPLES

Stratigraphic Unit	Depth Below Surface	Fine(<1mm)Fraction Sample No.	Fine(<1mm)Fraction Sample Wt.	Coarse(>1mm)Fraction Sample No.	Coarse(>1mm)Fraction Sample Wt.	Special Samples Sample No.	Special Samples Sample Wt.	Special Samples Sample Type	Special Samples Sample Depth
5	7.7 – 8.5	,19	2.443	,20	0.099				
	8.5 – 9.0	,21	1.343	,22	0.035				
	9.0 – 9.5	,23	1.536	,24	0.038				
	9.5 – 10.0	,25	1.991	,26	0.161				
	10.0 – 10.5	,27	1.776	,28	0.064				
	10.5 – 11.0	,29	1.904	,30	0.068				
	11.0 – 11.5	,31	1.721	,32	0.049				
	11.5 – 12.0	,33	1.727	,34	0.054				
	12.0 – 12.5	,35	1.431	,36	0.043				
4	upper half	,37	1.367	,38	1.574				
	lower half	,39	1.477	,40	0.481				
	14.0 – 14.5	,41	1.398	,42	0.753				
	14.5 – 15.0	,43	0.832	,44	1.474				
	15.0 – 15.5	,45	1.303	,46	0.294				
3	15.5 – 16.0	,47	1.767	,48	0.110				
	16.0 – 16.5	,49	2.000	,50	0.173				
	16.5 – 17.0	,51	1.824	,52	0.077				
	17.0 – 17.5	,53	1.678	,54	0.098				
	17.5 – 18.0	,55	1.907	,56	0.133				
	18.0 – 18.5	,57	1.567	,58	0.095				
	18.5 – 19.0	,59	1.986	,60	0.145				
	19.0 – 19.5	,61	2.054	,62	0.121				
2	19.5 – 20.0	,63	1.949	,64	0.203				
	20.0 – 20.5	,65	1.891	,66	0.186				
	20.5 – 21.0	,67	1.785	,68	0.195				
	21.0 – 21.5	,69	1.857	,70	0.175				
	21.5 – 22.0	,71	1.629	,72	0.141				
	22.0 – 22.5	,73	1.956	,74	0.248				
	22.5 – 23.0	,75	1.736	,76	0.220				
	23.0 – 23.5	,77	1.794	,78	0.222				
	23.5 – 24.0	,79	1.881	,80	0.292				
	24.0 – 24.5	,81	1.653	,82	0.171				
	24.5 – 25.0	,83	1.797	,84	0.147				
	25.0 – 25.5	,85	1.405	,86	0.091				
	25.5 – 26.0	,87	1.813	,88	0.431				
	26.0 – 26.5	,89	1.632	,90	0.172				
1	26.5 – 27.0	,91	1.201	,92	0.104				
	27.0 – 27.5	,93	1.501	,94	0.953				
	27.5 – 28.0	,95	2.003	,96	0.310				
	28.0 – 28.5	,97	1.849	,98	0.125				
	28.5 – 29.0	,99	1.664	,100	0.083				
	29.0 – 29.5	,101	1.820	,102	0.332				
	29.5 – 30.0	,103	1.667	,104	0.140				
	30.0 – 30.5	,105	1.561	,106	0.122				
	30.5 – 31.0	,107	1.910	,108	0.339				
	31.0 – 31.5	,109	2.730	,110	0.228	,111	0.700	white clast	30.8 - 31.4 cm
	31.5 – 32.0	,112	1.947	,113	0.134				
	32.0 – 32.5	,114	1.541	,115	0.205				
	32.5 – 33.0	,116	2.081	,117	0.098				
	33.0 – 33.5	,118	1.877	,119	0.256				
	33.5 – 34.0	,120	2.018	,121	0.149				
	34.0 – 34.5	,122	1.420	,123	0.153				
	34.5 – 35.0	,124	1.649	,125	0.931				
	35.0 – 35.5	,126	1.602	,127	0.084				
	35.5 – 36.0	,128	1.486	,129	0.283				
	36.0 – 36.5	,130	1.769	,131	0.574				
	36.5 – 37.0	,132	2.001	,133	0.090				
	37.0 – 37.6	,134	1.980	,135	0.113				

CORE SYNOPSIS

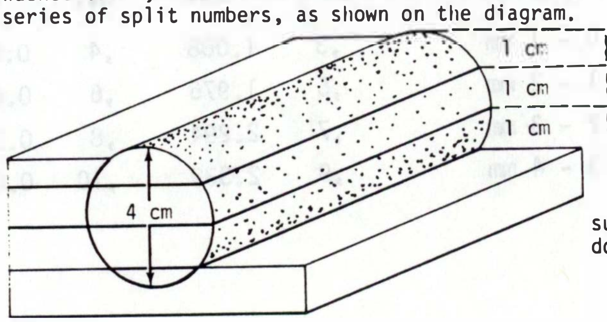
Sample No. 76001, a single, 4 cm diameter drive tube

Field relationships: The core was collected at the break in slope of the North Massif, on an 11° slope (massif slope is 24°), 10 m southwest of complex of large boulders and 20 m from boulder track, and 15 m southeast of nearest soil, 76500. Station 6 soils average 11% FeO.

Sample history - possible contamination or disturbance: 76001 was returned in bag SCB-7, and was subjected to spacecraft cabin and terrestrial atmosphere for 7 to 9 days, but had no known contact with seawater during spacecraft recovery. The top of the core appears intact and with less than 10% voids; it is one of the least disturbed cores in the Apollo collection.

Length (original) 32.2 cm, (extruded) 31.4 cm, Mass: 711.6 gm, Bulk Density 1.78 (post-extrusion)

Longitudinal dissections: In a standard dissection, samples are sieved at 1 mm under organically uncontaminated (CP-7) conditions. To produce samples with reduced contamination, the material in the second dissection was not sieved, but was subject to minimal handling with specially acid-washed tools, and should be suitable for Pb analysis. Each dissection is assigned a separate series of split numbers, as shown on the diagram.



,11 - ,999 1st (standard)
,1000 -,1999 2nd (minimal Pb)
,2000 -,2999 3rd (standard)
,6000 -,6999 impregnated sections

Early dissection of the 4mm at the lunar surface took place before extrusion, and is documented on a separate diagram.

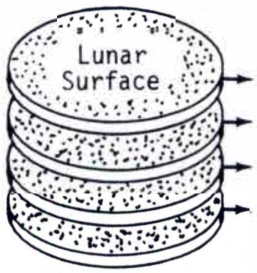
Summary of stratigraphic units identified during dissection:

Unit	Depth/samples	light/dark color	relative grain size	major petrographic components
6	0.0 - 6.0 cm ,2 - ,38 ,1010 - ,1020 ,2001 - ,2023	dark	fine 6% >1mm	The coarse fraction contains a mixture of rock types, including crystallized-matrix breccia, basalt, dark-matrix breccia and fused soil.
5	6.0 - 10.5 cm ,39 - ,56 ,1021 - ,1029 ,2024 - ,2041	dark	fine 4% >1mm	As above, but coarse particles are notable by their scarcity. Orange, dark, and clear glass are common in the fine fraction of units 3 through 6.
4	10.5 - 14.5 cm ,57 - ,72 ,1030 - ,1037 ,2042 - ,2058	dark	Units 3 & 4 are very unusual. Matrix is fine (5%	As above, with rare coarse particles, but with scattered boulders, over 1 cm, of fresh, crystallized-matrix breccia.
3	14.5 - 22.0 cm ,73 - ,102 ,1038 - ,1052 ,2059 - ,2088 ,2127	dark	>1mm) but scattered "boulders" (several cm) make up 50% of both units	Unit 3 is similar to 4, with rare, but varied 1-4mm coarse fines, scattered boulders of crystallized-matrix breccia, but with more plagioclase fragments than unit 4.
2	22.0 - 25.5 cm ,103 - ,116 ,1053 - ,1059 ,2089 - ,2102	moderately dark	moderately fine 10% >1mm	This unit is rich in clear, unshocked plagioclase. Orange and dark glass is uncommon in matrix fines, although clear and metallic droplets are common to abundant.
1	25.5 - 31.4 cm ,117 - ,140 ,1060 - ,1070 ,2103 - ,2126	moderately light	moderately fine 15% >1mm	This unit is lighter than above, because of a higher content of chalky, light-matrix breccia and shocked plagioclase in the fine fraction.

In general, the core contains dark, unusually fine-grained soil with a high concentration of Apollo 17 highland rock types and fused soils in the coarse fraction, and a mixture of partially shocked, plagioclase-rich fragments, orange, dark, and clear glasses as well as much nondescript (under the binocular microscope) material in the finer fractions. Basalt is present, but rare, throughout the core.

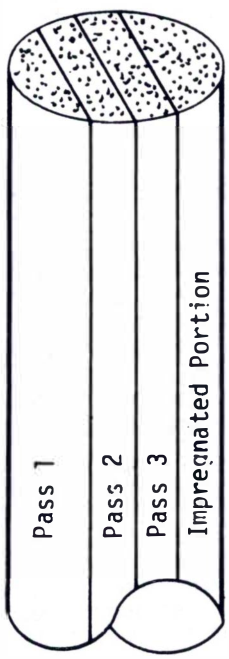
In order to characterize lunar surface processes, the uppermost 4mm of core 76001 was dissected transversely before the core was extruded into the longitudinal dissection receptacle. For the cross dissection, the core was placed upright, and four discs of soil, 1mm thick, were removed. (Normally five 1mm discs are removed, but the extruder failed to push the sample completely into the 5mm receptacle, so only the top 4mm was dissected.) Samples were sieved at 1mm and the size fractions were numbered as shown on the accompanying diagram. Then, the core was turned horizontally, and extruded into the dissection receptacle, where it was dissected lengthwise in 5mm increments. Three passes down through the diameter were required to complete the dissection.

POSITION OF CORE DURING THE CROSS DISSECTION



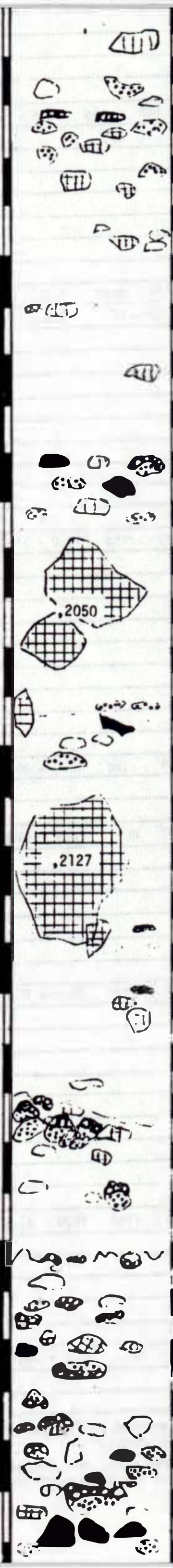
Sample Interval Below Lunar Surface	<1 mm Sample No.	<1 mm Sample Wt.	>1 mm Sample No.	>1 mm Sample Wt.
0 - 1 mm	,3	1.008	,4	0.042
1 - 2 mm	,5	1.976	,6	0.072
2 - 3 mm	,7	2.294	,8	0.219
3 - 4 mm	,9	2.339	,10	0.082

POSITION OF CORE DURING STANDARD DISSECTION



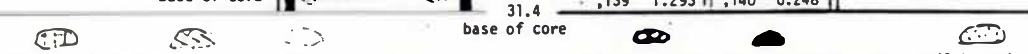
DRIVE TUBE 76001

LOCATION OF SAMPLES, FIRST DISSECTION



Stratigraphic Unit	Depth Below Surface	Fine (< 1mm) Fraction Sample No.	Fine (< 1mm) Fraction Sample Wt.	Coarse (> 1mm) Fraction Sample No.	Coarse (> 1mm) Fraction Sample Wt.	Special Samples Sample No.	Special Samples Sample Wt.	Special Samples Sample Type	Special Samples Sample Interval
top of core	0.4	See special section on top 4 mm.				,2	1.982	follower spillage	
	1.0	,17	1.730	,18	0.800				
	1.5	,19	1.312	,20	0.075				
6	2.0	,21	2.201	,22	0.151				
	2.5	,23	2.077	,24	0.187	,16	2.039	rind	0.4 - 5 cm
	3.0	,25	1.828	,26	0.140	Rind is the thin layer of smeared soil, next to the wall of the drive tube.			
	3.5	27	1.661	,28	0.124				
	4.0	,29	1.941	,30	0.275				
	4.5	,31	2.051	,32	0.091				
	5.0	,33	1.825	,34	0.121				
	5.5	,35	2.190	,36	0.036				
	6.0	,37	2.037	,38	0.110				
	6.5	,39	3.011	,40	0.154				
5	7.0	,41	1.766	,42	0.060				
	7.5	,43	2.103	,44	0.200				
	8.0	,45	2.108	,46	0.022	,15	2.487	rind	10 - 5 cm
	8.5	,47	2.092	,48	0.037				
	9.0	,49	2.100	,50	0.088				
	9.5	,51	2.005	,52	0.207				
	10.0	,53	2.079	,54	0.263				
	10.5	,55	1.911	,56	0.174				
	11.0	,57	2.105	,58	0.038				
	11.5	,59	1.273	,60	0.023				
4	12.0	,61	1.074	,62	0.030				
	12.5	,63	1.542	,64	4.451				
	13.0	,65	1.661	,66	0.031	,14	2.063	rind	15 - 10 cm
	13.5	,67	1.741	,68	0.107				
	14.0	,69	1.880	,70	0.054				
	14.5	,71	1.914	,72	0.425				
	15.0	,73	1.925	,74	0.566				
	15.5	75	2.195	,76	0.171				
	16.0	,77	1.898	,78	0.206				
	16.5	,79	1.834	,80	0.064				
	17.0	,81	1.234	,82	0.052				
3	17.5	,83	0.774	,84	0.040				
	18.0	,85	0.965	,86	0.059	,13	2.159	rind	20 - 15 cm
	18.5	,87	1.495	,88	0.058				
	19.0	,89	1.489	,90	0.148				
	19.5	,91	1.808	,92	0.192				
	20.0	,93	2.243	,94	0. 087				
	20.5	,95	2.227	,96	0.128				
	21.0	,97	2.037	,98	0.211				
	21.5	,99	2.099	,100	0.221				
	22.0	,101	2.292	,102	0.176				
	22.5	,103	2.266	,104	0.293				
	23.0	,105	1.734	,106	0.742	,12	2.221	rind	25-- 20 cm
	23.5	,107	2.113	,108	0.243				
2	24.0	,109	2.123	110	0.154				
	24.5	,111	2.357	,112	0.271				
	25.0	,113	1.721	,114	0.080				
	25.5	,115	2.299	,116	0.103				
	26.0	,117	1.784	,118	0.277				
	26.5	,119	2.231	,120	0.149				
	27.0	,121	2.287	,122	0.175				
1	27.5	,123	2.191	,124	0.305				
	28.0	,125	2.175	,126	0.291	,11	2.356	rind	31.4- 25 cm
	28.5	,127	1.984	,128	0.156				
	29.0	,129	2.352	,130	0.548				
	29.5	,131	2.152	,132	0.408				
	30.0	,133	2.177	,134	0.313				
	30.5	,135	2.191	,136	0.326				
base of core	31.0	,137	1.802	,138	1.050				
	31.4	,139	1.293	,140	0.248				

base of core



DRIVE TUBE 76001

LOCATION OF SAMPLES, SECOND (CHEMICALLY PURE) DISSECTION

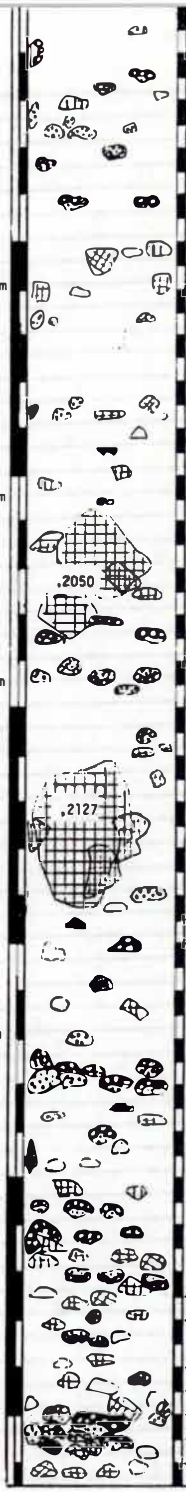
Stratigraphic Unit	Depth Below Surface	Sample No.	Sample Wt.	Sample No.	Sample Wt.	Sample Type	Sample Interval
top of core	0.4	See special section on top 4 mm.					
	1.0	,1010	3.429				
	1.5	,1011	3.494				
6	2.0	,1012	2.499				
	2.5	,1013	3.149				
	3.0	,1014	2.669	,1001	3.668	rind	0.5 - 5.0
	3.5	,1015	2.565				
	4.0	,1016	3.079				
	4.5	,1017	2.331				
	5.0	,1018	2.818				
	5.5	,1019	2.411				
	6.0	,1020	2.968				
	6.5	,1021	2.090				
	7.0	,1022	2.667	,1002	3.153	rind	5.0 - 10.0
	7.5	,1023	2.723	,1007	0.762	RL*	7.0 - 7.5
5	8.0	,1024	2.602				
	8.5	,1025	2.794				
	9.0	,1026	2.522				
	9.5	,1027	2.872				
	10.0	,1028	2.850				
	10.5	,1029	2.739				
	11.0	,1030	2.822				
	11.5	,1031	2.647				
4	12.0	,1032	1.836				
	12.5	,1033	1.538	,1003	3.869	rind	10.0 - 15.0
	13.0	,1034	1.737				
	13.5	,1035	1.876				
	14.0	,1036	2.521				
	14.5	,1037	2.802				
	15.0	,1038	2.482				
	15.5	,1039	1.678				
	16.0	,1040	2.296				
	16.5	,1041	1.782				
	17.0	,1042	1.631				
3	17.5	,1043	1.042	,1004	3.194	rind	15.0 - 20.0
	18.0	,1044	1.021				
	18.5	,1045	0.996				
	19.0	,1046	1.729	,1008	0.620	RL	18.9 - 19.0
	19.5	,1047	2.539				
	20.0	,1048	2.855				
	20.5	,1049	2.589				
	21.0	,1050	3.167				
	21.5	,1051	2.928				
	22.0	,1052	2.578				
	22.5	,1053	2.197	,1005	3.389	rind	20.0 - 25.0
	23.0	,1054	2.941				
2	23.5	,1055	2.817				
	24.0	,1056	2.904				
	24.5	,1057	2.815				
	25.0	,1058	2.646				
	25.5	,1059	2.648				
	26.0	,1060	3.280				
	26.5	,1061	2.951				
	27.0	,1062	2.864				
	27.5	,1063	2.886	,1006	4.820	rind	35.0 - 31.4
1	28.0	,1064	2.216				
	28.5	,1065	3.215				
	29.0	,1066	2.517				
	29.5	,1067	3.220				
	30.0	,1068	2.570				
	30.5	,1069	3.127	,1009	0.540	RL	30.0 - 30.5
	31.0	,1070	3.173				
base of core	31.4						

* RL - red light samples, never exposed to fluorescent light, and suitable for thermoluminescence studies

Rind is the thin layer of smeared soil, next to the wall of the drive tube. It is removed to preserve the purity and integrity of material on the inside of the core.

DRIVE TUBE 76001

LOCATION OF SAMPLES, THIRD (STANDARD) DISSECTION



Stratigraphic Unit	Depth below Lunar Surface (cm.)	Depth Below Surface	Interval Samples Fine (< 1mm) Fraction: Sample No.	Sample Wt.	Interval Samples Coarse (> 1mm) Fraction: Sample No.	Sample Wt.	Special Samples: Sample No.	Sample Wt.	Sample Type	Sample Interval
	top of core	0.4	See special section on top 4 mm.							
		1.0	,2001	2.141	,2002	0.115				
		1.5	,2003	3.676	,2004	0.168				
6		2.0	,2005	2.789	,2006	0.120				
		2.5	,2007	2.971	,2008	0.119				
		3.0	,2009	2.864	,2010	0.223				
		3.5	,2011	2.860	,2012	0.113				
		4.0	,2013	3.069	,2014	0.086				
		4.5	,2015	2.962	,2016	0.126				
		5.0	,2017	2.550	,2018	0.081				
		5.5	,2019	3.797	,2020	0.230	,2021	0.483	BsRF	5.3 - 6.0 cm
	6.0 cm	6.0	,2022	2.767	,2023	0.079				
		6.5	,2024	2.277	,2025	0.315				
		7.0	,2026	2.802	,2027	0.174				
5		7.5	,2028	3.080	,2029	0.062				
		8.0	,2030	3.152	,2031	0.059				
		8.5	,2032	2.764	,2033	0.125				
		9.0	,2034	2.558	,2035	0.308				
		9.5	,2036	2.962	,2037	0.095				
		10.0	,2038	2.753	,2039	0.086				
	10.5 cm	10.5	,2040	2.988	,2041	0.163				
		11.0	,2042	2.803	,2043	0.054				
		11.5	,2044	2.738	,2045	0.085				
		12.0	,2046	2.714	,2047	0.103				
4		12.5	,2048	1.587	,2049	0.047	,2050	11.427	XmBx	11.7 - 12.9 cm
		13.0	,2051	2.037	,2052	0.177				
		13.5	,2053	2.107	,2054	0.085				
		14.0	,2055	2.404	,2056	0.089				
	14.5 cm	14.5	,2057	2.924	,2058	0.117				
		15.0	,2059	3.186	,2060	0.063				
		15.5	,2061	3.067	,2062	0.075				
		16.0	,2063	3.242	,2064	0.089				
		16.5	,2065	2.535	,2066	0.089				
		17.0	,2067	2.645	,2068	0.205				
		17.5	,2069	2.590	,2070	0.314				
		18.0	,2071	2.730	,2072	0.164	,2127	21.002	XmBx	15.6 - 18.9 cm
3		18.5	,2073	2.473	,2074	3.268				
		19.0	,2075	2.369	,2076	0.286				
		19.5	,2077	3.080	,2078	0.086				
		20.0	,2079	2.730	,2080	0.115				
		20.5	,2081	3.051	,2082	0.204				
		21.0	,2083	3.004	,2084	0.149				
		21.5	,2085	2.681	,2086	0.103				
	22.0 cm	22.0	,2087	2.850	,2088	0.424				
		22.5	,2089	2.846	,2090	0.322				
		23.0	,2091	2.902	,2092	1.123				
		23.5	,2093	3.129	,2094	0.283				
2		24.0	,2095	3.065	,2096	0.145				
		24.5	,2097	3.239	,2098	0.252				
		25.0	,2099	2.836	,2100	0.176				
	25.5 cm	25.5	,2101	2.878	,2102	0.225				
		26.0	,2103	3.439	,2104	0.151				
		26.5	,2105	2.448	,2106	0.414				
		27.0	,2107	2.993	,2108	0.698				
		27.5	,2109	2.752	,2110	0.350				
1		28.0	,2111	3.350	,2112	0.403				
		28.5	,2113	2.794	,2114	0.227				
		29.0	,2115	2.980	,2116	0.216				
		29.5	,2117	3.123	,2118	0.373				
		30.0	,2119	2.521	,2120	0.681				
		30.5	,2121	2.546	,2122	1.055				
		31.0	,2123	2.863	,2124	0.583				
	base of core	31.4	,2125	1.629	,2126	0.229				

LITHOLOGIC SYMBOLS

crystallized-matrix breccia (probably the common noritic breccia of A 17 (XmBx)

mare basalt (BsRF)

light-matrix breccia (LMBx)

dark-matrix breccia (DMBx)

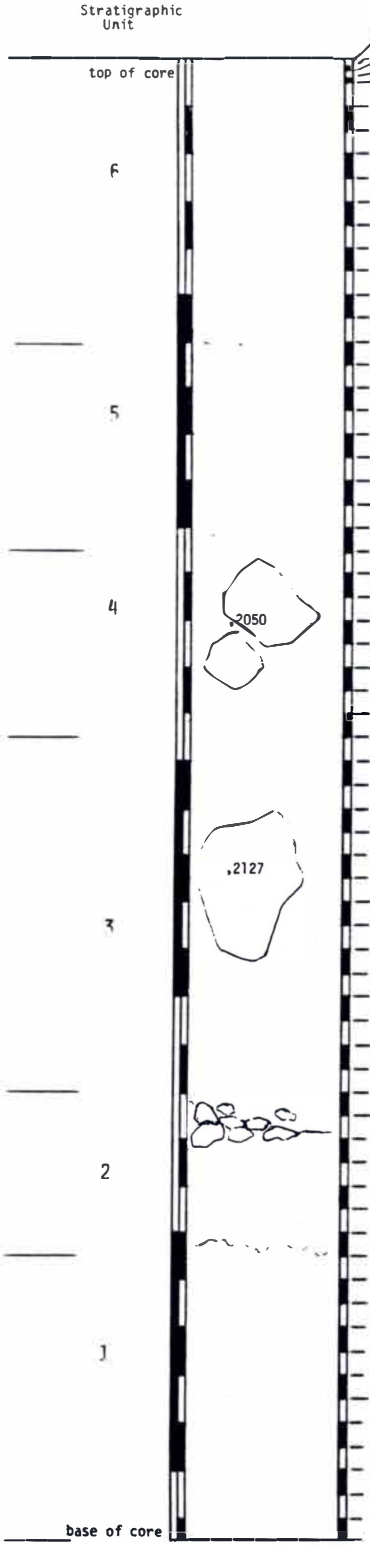
soil breccia (SoBx)

vesicular glass (VsGl)

vesicular glass plus attached soil breccia notice orientation as found in core (VsGl)

DRIVE TUBE 76001

ALLOCATIONS FROM FINE FRACTION, DISSECTION 1



Investigator, and daughter number of splits received

Sample Interval (LCL inventory)	Parent Sample	ARNOLD *	GOSE	PERKINS	WALKER
0.0	,3	,300		,141	
0.1	,5			,142	
0.2	,7			,143	
0.3					
0.4	,9	,301		,144	
1.0	,17	,302	,309		
1.5	,19	,303	,310		
2.0	,21	,304	,311	,145	
2.5	,23	,305	,312		
3.0	,25		,313	,146	,147
3.5	,27	,306	,314		
4.0	,29		,315		
4.5	,31		,316		
5.0	,33		,317		
5.5	,35	,307	,318	,148	
6.0	,37		,319		,149
6.5	,39		,320		
7.0	,41		,321		
7.5	,43		,322		
8.0	,45		,323		
8.5	,47		,324		
9.0	,49		,325		,150
9.5	,51		,326		
10.0	,53	,308	,327		
10.5	,55		,328		
11.0	,57		,329		
11.5	,59		,330		
12.0	,61		,331		,151
12.5	,63		,332		
13.0	,65		,333		
13.5	,67		,334		
14.0	,69		,335		
14.5	,71		,336		
15.0	,73		,337	,152	,153
15.5	,75		,338		
16.0	,77		,339		
16.5	,79		,340		
17.0	,81		,341		
17.5	,83		,342		
18.0	,85		,343		,154
18.5	,87		,344		
19.0	,89		,345		
19.5	,91		,346		
20.0	,93		,347		
20.5	,95		,348		
21.0	,97		,349		,155
21.5	,99		,350		
22.0	,101		,351		
22.5	,103		,352		
23.0	,105		,353		
23.5	,107		,354		
24.0	,109		,355		,156
24.5	,111		,356		
25.0	,113		,357		
25.5	,115		,358		
26.0	,117		,359		
26.5	,119		,360		
27.0	,121		,361		,157
27.5	,123		,362		
28.0	,125		,363		
28.5	,127		,364		
29.0	,129		,365		
29.5	,131		,366		
30.0	,133		,367		
30.5	,135		,368		,158
31.0	,137		,369	,159	
31.4	,139		,370		

* samples were returned in pristine condition and can be re-allocated

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