TABLE 2.-*Summary classification of Apollo 17 samples larger than 5 g*

Igneous, plutonic
78235,6,8. Norite.
78255. Norite.
78527. Norite(?).
Igneous, volcanic
70017. Olivine basalt.
70035. Olivine basalt.
70075. Olivine basalt.
70135. Basalt.
70136. Basalt.
70137. Basalt.
70185. Basalt.
70215. Olivine basalt.
70255. Olivine basalt
70275. Olivine basalt.
70315. Basalt
71035. Olivine basalt.
71036. Olivine(?) basalt.
71037. Olivine(?) basalt.
71045. Olivine basalt.
71055. Olivine(?) basalt.
71065. Olivine basalt.
71066. Olivine basalt.
71135. Olivine basalt
71136. Olivine basalt.
71155. Olivine(?) basalt.
71156. Olivine(?) basalt.
71175. Olivine basalt.
71505. Olivine basalt.
71506. Olivine basalt.
71526. Basalt
71528. Basalt.
71529. Basalt.
71535. Basalt.
71536. Basalt.
71537. Basalt.
71538. Basalt.
71539. Basalt.
71545. Basalt.
71546. Basalt
71547. Basalt.
71548. Basalt.
71549. Basalt.
71556. Basalt.
71557. Basalt
71558. Olivine basalt.
71559. Basalt.
71565. Olivine basalt
71566. Basalt.
71567. Olivine basalt.
71568. Olivine basalt.
71569. Olivine basalt.
71576. Olivine basalt.
71577. Olivine basalt.
71578. Olivine basalt.
71579. Basalt.
71585. Olivine basalt.
71586. Olivine basalt.
71587. Olivine basalt.
71,588. Olivine basalt.
71589. Olivne basalt.
71595. Olivine basalt
71596. Olivine basalt.
71597. Olivine basalt.
72155. Olivine basalt
74001-02. Volcanic ash.
74220. Volcanic ash.
74235. Olivine basalt.
74245. Olivine basalt.
74247. Olivine(?) basalt
74248. Basalt.
74255. Olivine basalt.
74275. Olivine basalt.
75015. Basalt
75035. Basalt.
75055. Olivine basalt.
75075. Olivine basalt.
76136. Olivine basalt.
76537. Olivine basalt.
76538. Basalt.
76539. Basalt.
77516. Olivine basalt.
77535. Basalt.
77536. Olivine basalt.
78135. Olivine basalt.
78505. Olivine basalt
78506. Olivine basalt.
78507. Olivine basalt

Igneous, volcanic - Continued
78509. Basalt
78528. Basalt.
78569. Basalt.
78.575. Olivine basalt.
78576. Basalt.
78577. Basalt.
78578. Basalt.
78579. Olivine basalt
78585. Basalt
78586 . Basat.
78587. Basalt.
78596. Basalt.
78597. Olivine basalt.
78598. Basalt
78599. Basalt.
79515. Olivine basalt.
79516. Olivine basalt.
Sedimentary, unconsolidated
70001-09. Dominantly basalt, breccia, and feldspathic clastic and metaclastic rocks.
70011. Unopened sample container.
70012. Dominantly basalt.
70160-64. Dominantly basalt.
70180-84. Dominantly basalt
70270-74. Dominantly basalt.
70311-14. Dominantly basalt
70320-24. Dominantly basalt
71040-44. Dominantly basalt
71060-64. Dominantly basalt
71130-34. Dominantly basalt.
71150-54. Dominantly basalt and breccia.
71500-04. Dominantly basalt and breccia.
72130-34. Dominantly basalt, in part balsaltic breccia.
72140-44. Dominantly basalt and glass.
72150. No description.
72160-64. Dominantly breccia and agglutinate.
72220-24. Dominantly breccia.
72240-44. Dominantly breccia and agglutinate.
72260-64. No description.
72320-24. Dominantly agglutinate and breccia.
72410. No description.
72430-34. Dominantly breccia.
72440-44. Dominantly breccia.
72460-64. Dominantly breccia.
72500-04. Dominantly breccia.
72700-04. Dominantly breccia.
73001-02. Unopened double drive tube.
73120-24. Dominantly breccia.
73130-34. Dominantly breccia.
73140-44. Dominantly breccia.
73150-54. Dominantly breccia.
73210-14. Dominantly breccia.
73220-24. Dominantly breccia.
73240-44. Dominantly breccia.
73260-fi4. Dominantly breccia.
73280-84. Dominantly breccia.
74110-14. Dominantly basalt breccia, feldspathic cataclasite, agglutinate, and glass.
74120-24. Dominantly breccia and agglutinate.
74240-44. Dominantly basalt.
74260. Dominantly breccia, glass, and agglutinate.
75060-64. Dominantly basalt.
75080-84. Dominantly basalt.
75110-14. Dominantly basalt.
75120-24. Dominantly basalt.
76001. Unopened drive tube.
76030-34. Dominantly basalt.
76120-24. Dominantly breccia.
76130-34. No description.
76220-24. No description.
76240-44. Dominantly basalt.
76260-fi4. Doiminantly breccia.
76280-84. Dominantly breccia.
76320-24. Dominantly breccia.
76500-04. Dominantly breccia.
77510-14. Dominantly breccia.
77530-34. Dominantly breccia.
78120-24. Incomplete description.
78220-24. Dominantly breccia.
78230-34. No description.
78250. No description.
78420-24. Dominantly breccia.
78440-44. Dominantly breccia and agglutinate.
78460-64. Dominantly breccia and agglutinate.
78480-84. Dominantly agglutinate, breccia, glass, and feldspathic cataclasite.

Sedimentary, unconsolidated - Continued
78500-04. Dominantly agglutinate, breccia, glass, and feldspathic cataclasite.
78530. No description.
79001-02. Unopened double drive tube.
79120-24. Dominantly breccia.
79220-24. Dominantly breccia.
79240-44. Dominantly breccia and basalt.
79260-64. Dominantly breccia and basalt.
79510-14. Dominantly breccia.
Sedimentarv, impact consolidated
70018. Impact-amsolidated polymict breccia.
70175. Impact-consolidated polymict breccia.
79115. Impact-consolidated polymict breccia.
79135. Impact-consolidated polymict breccia.
Sedimentary, weakly lithified by welding or sintering
70295. Weakly lithified polymict breccia.
74115. Weakly lithified polymict breccia.
74116. Weakly lithified polymict breccia.
74246. Weakly lithified polymict breccia.
76565. Weakly lithified pnlymict brcccia.
76567. Weakly lithified polymict breccia.
78508. Weakly lithified polymict breccia.
78525. Weakly lithified polymict breccia.
78526. Weakly lithified polymict breccia.
78535. Weakly lithified polymict breccia.
78536. Weakly lithified polymict breccia.
78537. Weakly lithified polymict breccia.
78538. Weakly lithified polymict breccia.
78545. Weakly lithified polymict breccia.
78546. Weakly lithified polymict breccia.
78547. Weakly lithified polymict breccia.
78548. Weakly lithified polymict breccia.
78549. Weakly lithified polymict breccia.
78555. Weakly lithified polymict breccia.
78556. Weakly lithified polymict breccia.
78557. Weakly lithified polymict breccia.
78567. Weakly lithified polymict breccia.
79035. Weakly lithified polymict breccia.
79195. Weakly lithified polymict breccia.
79225. Weakly lithified polymict breccia.
79226. Weakly lithified polymict breccia.
79227. Weakly lithified polymict breccia.
79517. Weakly lithified polymict breccia
79518. Weakly lithified polymict breccia
Metamorphic, recognizable source rock, cataclasite
72135. Basalt cataclasite.
72415-18. Metadunite cataclasite.
76235-39. Olivine metanorite cataclasite.
76335. Troctolite cataclasite.
76536. Olivine(?) norite cataclasite.
76568. Basalt cataclasite.
77215. Norite cataclasite.
78155. Metagabbro cataclasite.
Metamorphic, recognizable source rock, thermally metamorphosed
76535. Metatroctolite.
79215. Metatroctolite(?) breccia with a granoblastic matrix.
Metamorphic, recognizable source rock, impact fused
77017. Olivine gabbro breccia with a glassy matrix.
79155. Olivine gabbro breccia with a glassy matrix.
Metamorphic, recognizable source rock, thermally metamorphosed or impact fused, undifferentiated
72736. Metanorite(?) breccia with a poikilitic(?) matrix.
73145. Metagabbroid(?) breccia with an aphanitic matrix.
79245. Troctolite(?) breccia with an aphanitic matrix.
Metamorphic, source rocks, indistinguishable or mixed, cataclastic
72235. Polymict breccia with a cataclastic matrix.
72275. Polymict breccia with a cataclastic matrix.
73155. Polymict breccia with a cataclastic matrix
73215. Polymict breccia with a cataclastic matrix.
73235. Polymict breccia with a cataclastic matrix.
76255. Polymict breccia with a cataclastic matrix.
Metamorphic, source rocks indistinguishable or mixed, thermally metamorphosed
72315. Polymict breccia with a granoblastic matrix.
72355. Polymict breccia with a granoblastic matrix.
73216. Polymict breccia with a granoblastic matrix.
73275. Metaclastic, with a granoblastic matrix.
76055. Polymict breccia with a granoblastic matrix.
Metamorphic, source rocks indistinguishable or mixed, impact fused
70019. Polymict breccia with a glassy matrix.
76545. Polymict brcccia with a glassy matrix.
76.546. Polymict breccia with a glassy matrix.
76547. Polymict breccia with a glassy matrix.
76549. Polymict breccia with a glassy matrix.
79175. Polymict breccia with a glassy matrix.

TABLE 2.-*Summary classification of Apollo 17 samples larger than 5 g- Continued*

Metamorphic, source rock indistinguishable or mixed, thermally metamorphosed or impact fused, undifferentiated

72215.	Polymict breccia with an aphanitic matrix.
72255.	Po lymict breccia with an aphanitic matrix.
72335.	Polymict breccia with a poikilitic(?) matrix.
72375.	Polymict breccia with a poikilitic(?) matrix.
72395.	Polymict breccia with an aphanitic matrix.
72435.	Polymict breccia with a poorly developed poikilitic matrix.
72535.	Polymict breccia with an aphanitic matrix.
72536.	Polymict breccia with an aphanitic matrix.
72537.	Polymict breccia with an aphanitic matrix.
72538.	Polymict breccia with an aphanitic matrix.
72539.	Polymict breccia with an aphanitic matrix.
72547.	Polymict breccia with an aphanitic matrix.
72548.	Polymict(?) breccia with an aphanitic matrix.
72549.	Metaclastic, with a poikilitic(?) matrix.
72555.	Metaclastic, with a poikilitic(?) matrix.
72558.	Metaclastic, with a poikilitic(?) matrix.
72559.	Metaclastic, with an aphanitic matrix.

Metamorphic, source rock indistinguishable or mixed, thermally metamorphosed or impact fused undifferentiated - Continued

72735.	Metaclastic, with an aphanitic matrix.
72738.	Polymict(?) breccia with an aphanitic matrix.
7:3217.	Pnlymict breccia with an aphanitic matrix.
73218.	Polymict breccia with an aphanitic matrix.
73255.	Polymict breccia with an aphanitic matrix.
76015.	Metaclastic, with a poikilitic matrix.
76035.	Polymict breccia with an aphanitic matrix.
76135.	Metaclastic, with a poikilitic matrix.
76215.	Metaclastic, with a dominantly poikilitic matrix.
76245.	Metaclastic, with a poikilitic(?) matrix.
76246.	Metaclastic, with a poikilitic(?) matrix.
76275.	Polymict breccia with an aphanitic matrix.
76295.	Polymict breccia with an aphanitic matrix.
76315.	Polymict breccia with an aphanitic matrix.
76555.	Polymict breccia with an aphanitic matrix.
76556.	Polymict breccia with an aphanitic matrix.
76557.	Polymict breccia with an aphanitic matrix.
76575.	Polymict breccia with an aphanitic matrix.

Metamorphic, source rock indistinguishable or mixed, thermally metamorphosed or impact fused, undifferentiated - Continued

76576.	Breccia with an aphanitic matrix.
76577.	Metaclastic, with an aphanitic matrix.
77035.	Polymict breccia with an aphanitic matrix.
77075.	Monomict(?) breccia with an aphanitic matrix.
77076.	Monomict(?) breccia with an aphanitic matrix.
77077.	Monomict(?) breccia with an aphanitic matrix.
77115.	olymict breeds with an aphanitic matrix.
77135.	Poymict breccia with a poikilitic matrix.
77515.	Polymict breccia with a poikiftic(?) matrix.
77517.	Polymict breccia with an aphanitic matrix.
77518.	Breccia with a poikilitic(?) matrix.
77519.	Polymict breccia with a poikilitic(?) matrix.
77537.	Breccia with a poikilitic(?) matrix.
77538.	Polymict breccia with an aphanitic matrix.
77539.	Polymict breccia with a poikilitic(?) matrix.
77545.	Polymict breccia with a poikilitic(?) matrix.

in three general areas (fig. 8): (1) the ALSEP area about 200 m west of the LM, (2) the LM area, and (3) the area near the transmitter for the Surface Electrical Properties experiment (SEP) about 150 m east of the LM.

OBJECTIVES

As far as could be determined from premission photographs, the immediate landing area was free of blocks and was one of the less cratered parts of the valley floor. It was considered likely to be less informative about the geology of the region than were the planned traverse stations. Therefore, except for the acquisition of a 3-m-long core in the ALSEP area, no rigorously structured plans for sampling or observation were made for the LM /ALSEP/SEP area. It was anticipated, however, that observations would be made and samples collected as opportunities arose during deployment of the ALSEP and SEP hardware as well as during the near-LM activities at the beginnings and ends of the three EVA's.

GENERAL OBSERVATIONS

The valley floor in the LM/ALSEP/SEP area is gently rolling to locally flat (fig. 9). Boulders and cobbles are more abundant in this area than over the valley floor in general; the larger ones, near the ALSEP, reach about 4 m in size. In contrast, no such concentration of large boulders was seen on the valley floor west of Camelot crater.

Rocks of the LM/ALSEP/SEP area are predominantly vesicular coarse-grained subfloor basalt, but fine-grained basalt occurs also. All of the larger rocks are partly buried by loose sediment. Clods of regolith breccia presumably formed by impact are also present.

Unconsolidated sediment of the regolith is commonly medium dark gray. Throughout the LM/ALSEP/SEP area the bulk of the regolith is less than about 3 or 4 cm in grain size; larger fragments are scattered. The regolith becomes increasingly cohesive with depth, to about 25-35 cm. Alternating zones offering more or

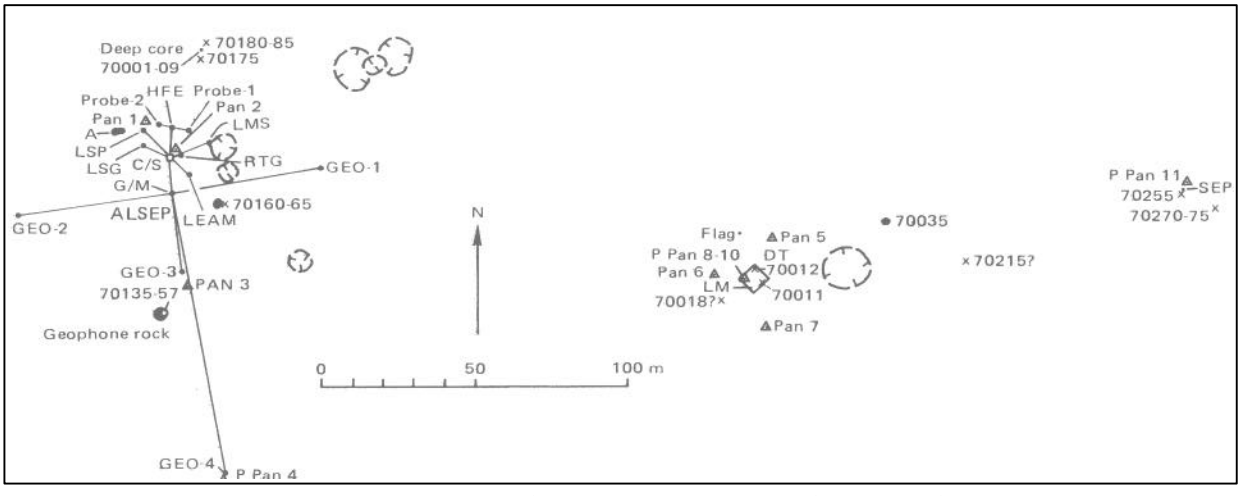

FIGURE 8.-Planimetric map of LM /AI SEP/SEP area. See glossary for explanation of symbols.

less resistance to drilling were encountered in the holes drilled for the Heat Flow experiment and the deep core. The most resistant layer is at a depth of about 2 m.

There are no conspicuous surface lineaments in the station area. Pitted "raindrop" texture is common but is most pronounced at the SEP site.

The surface in the LM/ALSEP/SEP area contains many 20-cm to 2-m craters, some of which have glassy material on their floors. The nearest large craters to the station are Rudolph (80 m in diameter), 70 m north of ALSEP, and highly subdued Poppy (100 m in diameter), 70 m south of the LM.

GEOLOGIC DISCUSSION

Basalt in the LM/ALSEP/SEP area consists of fragments excavated by impacts from the upper part of the subfloor basalt, which partially filled the Taurus-Littrow valley about 3.75 b.y. ago. The basalt is now overlain by unconsolidated material estimated to average 14 m in thickness (Wolfe and others, 1975). The source craters for the larger blocks have not been identified, but most of them probably came from the craters clustered south and east of the LM (pl. 2); the large crater Camelot, to the west, is a less likely source because (1) scarcity of large blocks elsewhere outside Camelot suggests that the large blocks in the LM area are not Camelot ejecta (Muehlberger and others, 1973) and (2) analyzed LM-area basalt is chemically unlike The sampled boulders on the rim of Camelot, but is similar to some basalt fronm station 1 on the ejecta blanket of Steno crater. Exposure ages determined on LM-area boulders range from 95 to 106 m.y.; they are approximately equivalent to exposure ages measured for the two boulders sampled at station 1 (102 and 110 m.y.).

The sedimentary materials and the pebble- and cobble-size basalt fragments collected from the surface in the LM/ ALSEP/SEP area are regolith materials that are largely derived from the subfloor basalt and are representative of the basalt-rich cluster ejecta. This unit, ejecta of the abundant clustered craters of the valley floor, may comprise approximately the upper 80 cm of the deep drill core. The lower 2 m or more of the drill core are from (the more heterogeneous older regolith of the valley floor (fig. 10).

SUMMARY OF SAMPLING

Sample 70001-70009

		Weight (g)	*Returned sample length (cm)*
70009	Drill core stem (top)	143.3	24.9
70008	Drill core stem	261.0	38
70007	Drill core stem	179.4	30
70006	Drill core stem	234.2	39.9
70005	Drill core stem	240.7	39.9
70004	Drill core stem	238.8	39.9
70003	Drill core stem	237.8	39.9
70002	Drill core stem	207.8\	
70001	Drill core stem	29.78/	42.0
		1772.8	294.5

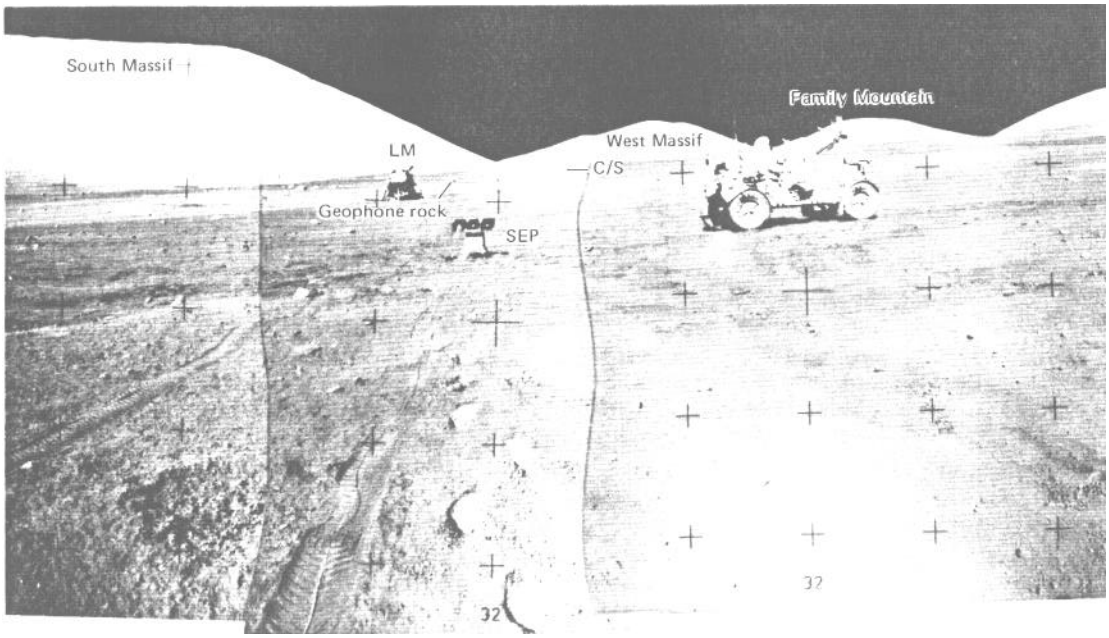

FIGURE 9.-Partial panorama looking west from SEP site toward LM and ALSEP areas. (NASA photographs AS17-141-21515, 21516, and 21517.)

Depth: Approximately 0 to 3.2 m.

Location: Approximately 35 m north-northeast of ALSEP central station (fig. 8).

Illustrations: Pan 1; figures 11, 24.

Comments: The deep core was drilled within a slight depression, perhaps a greatly subdued crater, that the crew estimated to be about 4 m across. The regolith surface at the deep drill site was extensively disturbed by the astronauts. The sediment at the surface is loose; it is more coherent below 3 to 4 cm depth. The drill penetrated to about 3 m, alternating between easy and difficult in penetration. Regolith sample 70180-84 was later collected 3 m to the east for comparison with the materials of the core.

Stratigraphy: Direct observation of the upper 93 cm (core stems 70007, 08, 09) shows that the upper part of the deep core is dominated by a very coarse grained basalt-rich unit that extends from approximately 18 to 83 cm depth (Waltz and Nagle, 1976).

The uppermost unit, approximately 18 cm thick, is fine-grained sediment composed largely of fragments of glass, regolith breccia, and agglutinate (Waltz and Nagle, 1976). It overlies a coarse basaltrich unit about 65 cm thick (table 3). Many fragments in the upper part of the basalt-rich unit are coated with frothy or vesicular glass. Reworked material (presumably agglutinate, glass, and regolith breccia) increases downward in the lower part of the basalt-rich unit. Waltz and Nagle concluded that the basalt-rich unit might have been deposited as ejecta of a single cratering event in which both regolith, represented by the reworked material in

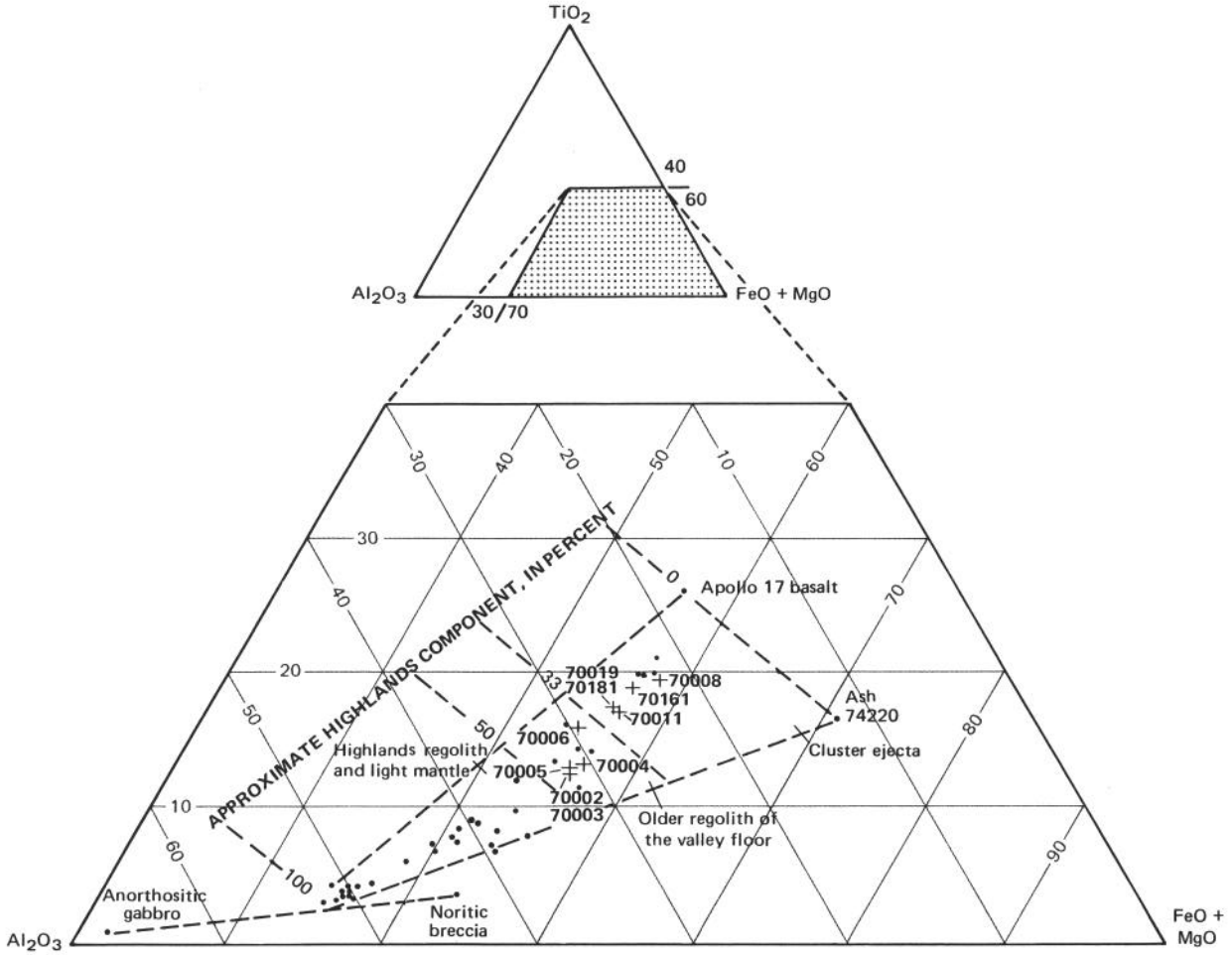

FIGURE 10.-Relative amounts of TiO_2, Al_2O_3 and Fe0 + Mg0 in sediment samples from LM /ALSEP/SEP area (crosses) in comparison with sediment samples from rest of traverse region (dots). Plot includes glassy polymict breccia 70019. Lower two-thirds of deep core (70002-70006) are in compositionally mixed older regolith of valley floor; upper part of deep core (70008) and all surface samples are in basalt-rich cluster ejects. Apollo 17 basalt, anorthositic gabbro, and noritic breccia values from Rhodes and others (1974).

TABLE 3-Components, in volume percent, of 90-150um factions from approximately 27 to 59 cm depth m the deep core (Heiken and McKaY, 1974)

Sample No.	70008.215	70008.220	70008.228	70008.231	70008.325	70008.239
Approximate depth in centimeters	27 to 29	33 to 33.5	43 to 45	47 to 49	56 to 56.5	57 to 59
Agglutinate	7.6	9.0	9.1	8.7	20.3	17.4
Basalt, equigranular	19.6	19.0	16.8	18.0	19.7	20.5
Basalt, variolitic	4.0	5.0	5.2	5.7	2.7	1.0
Breccia:						
Low-grade[1] - brown	8.0	4.3	3.2	5.3	1.7	3.7
Low-grade[1] - colorless	--	--	.3	.7	--	.7
Medium-high grade[2]	1.7	2.7	2.3	1.0	.7	1.3
Anorthosite	--	--	.3	--	.3	--
Cataclastic anorthosite	--	1.7	1.0	.7	1.7	.7
Plagioclase	8.0	11.0	12.3	10.3	10.7	8.4
Clinopyroxene	27.9	21.7	28.2	32.0	22.0	17.1
Orthopyroxene	--	--	.3	--	--	--
Olivine	--	1.0	--	.3	--	--
Ilmenite	4.3	3.7	3.9	3.3	1.7	3.3
Glass:						
Orange	5.0	7.7	3.9	3.7	5.3	4.3
"Black"	9.3	12.0	11.7	7.7	11.0	15.0
Colorless	1.3	1.0	.7	1.0	--	.7
Brown	1.3	1.0	.3	1.0	1.3	.7
Gray, "ropy"	--	--	.3	.7	1.0	1.0
Other	.6	.3	--	--	--	1.0
Total grains counted	301	300	309	300	300	298

[1] Metamorphic groups 1-3 of Warner (1972).
[2] Metamorphic groups 4-8 of warner (1972).

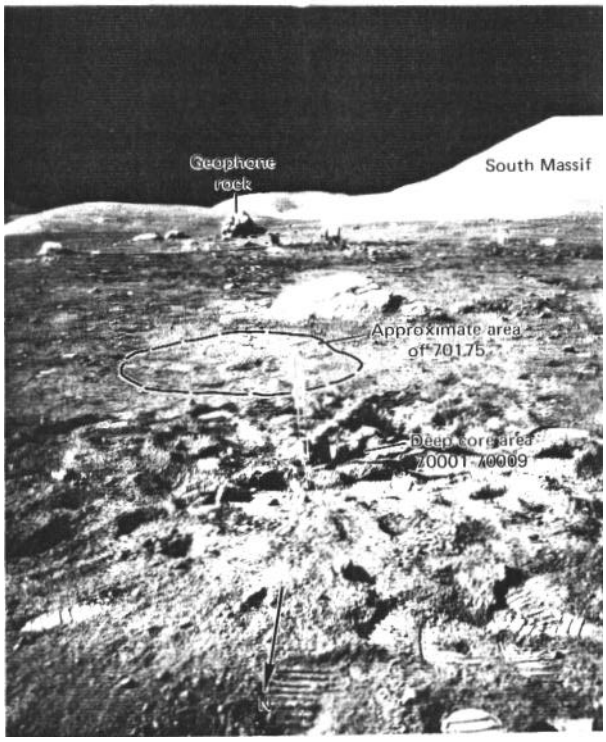

FIGURE 11.-Deep core (sample 70001 -70009) site, with neutron flux probe in deep core hole. Approximate area from which sample 70175 was collected is behind handle of core stem extractor. (NASA photograph AS 17-134-20504.)

the lower part of the unit, and bedrock, represented by abundant fresh rock fragments, were excavated. The glass coatings in the upper part might have formed from melt generated at the impact target.

Of the remaining 2.1 m of core, only the upper 10 cm has so far been dissected and examined directly. This portion consists of subunits of various grain sizes. Composition is similar to the uppermost 18 cm of the core in that basalt fragments are relatively few except in coarser subunits.

X-ray examination (Butler, 1973) of the lower 2 m of the core and studies of fragments from the bit and from the joints between individual core stems indicate that the lower two-thirds of the core is largely finer grained, layered in part, and is compositionally distinct from the upper basalt-rich portion.

The major-element chemistry of samples from core stem 70008 and from the bit and core stem junctions is shown in table 4. The lower five samples, ranging in depth from 133 to 294 cm, represent a uniform mixture of highlands and basaltic components in which the highlands contribution is between one-third and one-half (fig. 10). The upper part of the core, represented by a sample from approximately 31 cm depth (in core stem 70008), has much more basalt; the highlands component is about 20 percent. The sample from the top of core stem 70006, at a depth of 93 cm, is transitional in major-element chemistry between the upper and lower parts of the core. In general agreement with the major-element data, Silver (1974) interpreted a significant compositional

TABLE 4. – *Chemical analyses of deep core samples*

(Analyses 1-6 from Helmke and others (1973); no. 7 from Laul and others (1974) ; --, not determined)

	1	2	3	4	5	6	7
SiO_2	42.1	43.4	42.9	42.6	42.6	41.6	--
Al2O3	14.1	14.0	13.9	13.7	14.1	13.3	10.8
FeO	14.5	14.5	14.5	14.9	14.7	15.2	18.0
MgO	10.3	9.94	10.3	10.1	9.97	9.56	10
CaO	11.2	10.9	11.0	11.2	11.2	10.9	10.3
Na_2O	43	.48	.46	.44	.42	.46	.46
K_2O	.120	.227	.149	.114	.118	.101	.085
TiO_2	5.85	5.56	5.44	6.00	5.80	7.23	9.4
MnO	.200	.199	.203	.209	.207	.213	.231
Cr_2O_3	--	--	--	--	--	--	--
Total	98.8	99.206	98.85	99.26	99.115	98.56	

1. 70001, 12; bit depth-294 cm
2. 70002, 12; top of 70002; depth - 253 cm
3. 70003, 12; top of 70003; depth - 213 cm
4. 70004, 12; top of 70004; depth - 173 cm
5. 70005, 12; top of 70005; depth - 133 cm
6. 70006, 12; top of 70006; depth - 93 cm
7. 70008, 218; 5.7 to 6.2 cm below top of 70008; depth – 31 cm; < 1mm size

discontinuity between 93 and 133 cm depths from U-Th-Pb measurements. Curtis and Wasserburg (1975a) reported a significant distinction in trace-element compositions between the samples from deeper than 93 cm and those from shallower than 52 cm. A sample at 64 cm was chemically transitional. Interpreting neutron fluence from isotopic ratios of Sm and Gd, Curtis and Wasserburg found that uniformly low irradiation characterizes the upper 52 cm of the deep core and uniformly high irradiation characterizes the core from 93 cm downward. As with the trace-element data, neutron fluence data for the sample from 64 cm suggest that it lies in a transition zone between the distinct upper and lower parts of the core.

Exposure history: Combining their neutron fluence data and the available compositional data, Curtis and Wasserburg (1975x) proposed that the entire interval sampled by the deep core was deposited within the past 100 to 200 m.y. The lowest part was derived from materials that had undergone heavy preirradiation and the upper part from materials with relatively little preirradiation. This contrasts with the earlier interpretation of Dragon and others (1975), based on measurements of argon, that the lower interval accumulated in two depositional events, the older of which occurred nearly 1 b.y. ago. Spallation profiles for the other rare gases (Pepin and others, 1975), like the neutron fluence results, are not compatible with lengthy in-place radiation of the lower two-thirds of the core.

Both the neutron-fluence and rare-gas data are compatible with models wherein the upper basalt-rich interval is relatively young. Dragon and others (1975) suggested that a 90-m.y. age best fit the Ar measurements. Crozaz and others (1974) interpreted a 10-m.y. track age for material in the interval from 40 to 60 cm. However, this age is unreasonably young. Possibly material from the upper part of the deep core was lost or disturbed (Waltz and Nagle, 1976); hence the measured track density may reflect an age greater than 10 m.y. (Arvidson and others, 1976a; Crozaz and Plachy, 1976a). More recently, Crozaz and Plachy (1976b) suggested that the anomalously young 10-m.y. age might be explained by the following model: (1) deposition of the upper basalt-rich interval approximately 100 m.y. ago; (2) removal of approximately 25 cm of sediment from the lunar surface within the past 2 m.y. by an impact that formed the shallow depression in which the deep core was drilled; (3) rapid partial filling of the depression by surface-irradiated material.

Geologic significance: The deep core sampled regolith material. The upper, basalt-rich interval is a sample of the cluster ejecta, and the lower interval, more enriched in highlands debris, is from the older regolith of the valley floor (Wolfe and others, 1975).

Sample 70011 (fuel products contamination sample)

Type: Sedimentary, unconsolidated. *Weight:* 440.7 g.

Depth: 0-3 cm.

Location: Beneath LM, near -Z (eastern) footpad.

Illustrations: Pan 7, fig. 12.

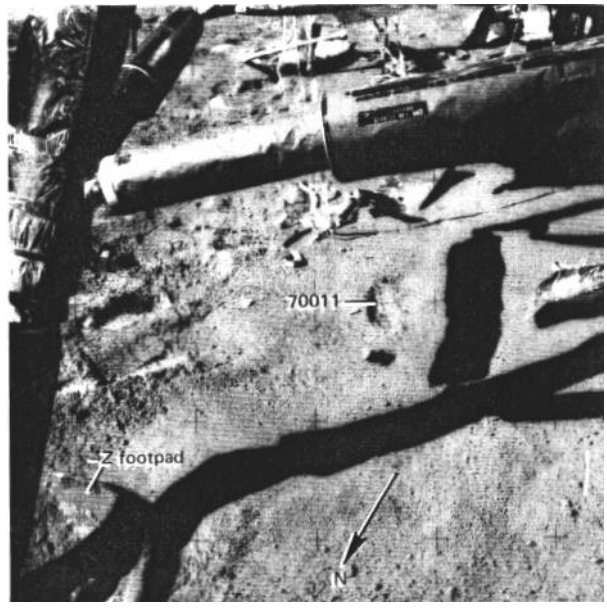

FIGURE 12.-Postsampling view of sample 70011 area beneath LM. (NASA photograph AS 17-143-21929.)

Comments: Sample 70011 was collected from a level surface that was slightly disturbed by the LM engine exhaust on descent. The surface material is fine grained with scattered pebbles up to about 2 cm in size. There are no craters in the immediate sample site. Sample is regolith material from the valley floor surface.

Major element composition:

Chemical analyses of 70011

	1	2	3
SiO_2	41.5	41.03	41.3
Al_2O_3	12.43	11.98	12.2
FeO	16.0	16.24	16.1
MgO	9.93	10.08	10.0
CaO	11.1	11.08	11.09
Na_2O	.375	.31	.34
K_2O	.078	.08	.08
TiO_2	7.36	8.30	7.83
P_2O_5	.048	.10	.07
MnO	.216	.23	.22
Cr_2O_3	.384	.41	.40
Total	99.421	99.84	99.67

1. 70011,12 (Wanke and others, 1974).
2. 70011,25 (Rose and others, 1974).
3. Average of 1 and 2.

Sample 70012

Type: Single drive tube.

Length: 18.8 cm.

Depth: Approximately 28 cm.

Net weight: 485.0 g.

Location: Beneath LM approximately 0.5 m behind the +Y (northern) footpad.

Illustrations: Pans 5, 6.

Comments: The sample area is level and relatively smooth. Small fragments, up to about 4 cm in diameter, litter less than 1 to 2 percent of the local surface, which was swept by the LM descent engine exhaust. Because the bottom cap came loose, part of the sample spilled from the drive tube in transit.

Petrographic description: Unconsolidated sedimentary material; dominantly basalt fragments.

Sample 70017

Type: Olivine basalt.

Size: 18X14X10 cm.

Weight: 2,957 g.

Location: Exact source unknown; sample was most probably collected near the LM on its west side.

Illustration: Figure13 (LRL).

Petrographic description: Medium-grained vesicular porphyritic olivine basalt. Aggregates of clinopyroxene and ilmenite in a locally plumose groundmass of plagioclase, clinopyroxene, ilmenite, and accessory minerals.

Major-element composition:

Chemical analyses of 70017

	1	2	3	4	5	6
SiO_2	38.37	38.8	38.80	38.07	38.68	38.5
Al_2O_3	8.78	9.73	8.54	8.79	7.40	8.65
FeO	18.71	17.60	18.12	18.07	18.77	18.25
MgO	9.41	8.89	10.16	9.81	10.45	9.74
CaO	10.43	10.04	10.56	10.30	10.05	10.28
Na_2O	.43	.43	.33	.40	.34	.39
K_2O	.047	.036	.07	.04	.07	.05
TiO_2	12.83	12.44	12.84	13.10	13.75	12.99
P_2O_5	.052	.048	.04	.05	.04	.05
MnO	.247	.232	.24	.27	.25	.25
Cr_2O_3	.577	.45	.49	--	.49	.50
Total	98.883	99.70	100.19	99.90	100.29	99.65

1. 70017,18 (Duncan and others, 1974).
2. 70017,23 (Nava, 1974).
3. 70017,30 (Rose and others, 1974).
4. 70017,35 (Rhodes and others, 1974).
5. 70017,50 (Rhodes and others, 1974).
6. Average of 1 through 5.

Age:

Rb-Sr isochron: 70017,35, 3.68 ± 0.18 b.y. (2a) (Nyquist and others, 1975)

$^{40-39}$Ar: 70017,65, no well-defined plateau; 3.80 ± 0.03 b.y. may be an older limit on crystallization age; 3.63 ± 0.03 K-Ar age should be the younger limit (Phinney and others, 1975).

Exposure age:

Ar:

70017, 126 m.y. (Arvidson and others, 1975).
70017,65, 220±20 m.y. (Phinney and others, 1975).

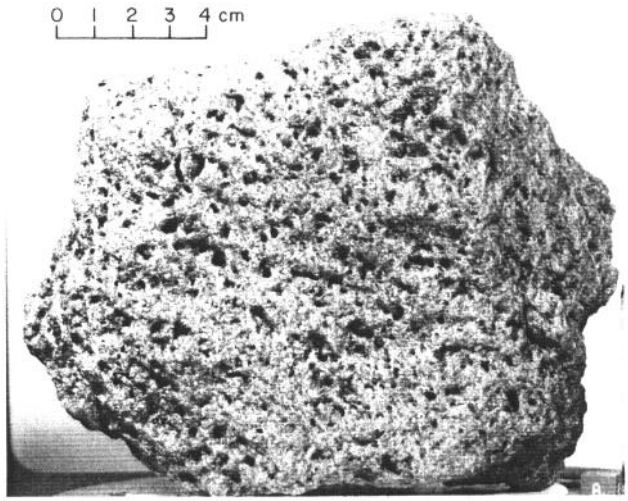

FIGURE 13.-Sample 70017. Medium-grained vesicular olivine basalt. (NASA photograph S-73-15720.)

Sample 70018

Type: Sedimentary, impact-consolidated polymict breccia.
Size: 5.5X4.5X1.8 cm.
Weight: 51.58 g.
Location: Near the LM, possibly from the floor of a 1.5-m crater located about 10 m southwest of the LM.
Illustrations: Pans, 6, 7, 8, 10; figure 14 (LRL).
Comments: A fragment tentatively identified as sample 70018 is visible in panorama 8, taken from the LM window prior to EVA 1, and is missing in panorama 10, taken from the same position after completion of EVA 3. The 1.5-m crater from which the sample may have come is the largest in the immediate area. A 60-cm white boulder is largely buried in the crater wall. The sampled rock may also have been largely buried. Similar-looking dark rocks are visible on the eastern crater rim. Prior to collecting this sample, the crew described the occurrence near the LM of meter-sized craters with glassy floors. Sample 70018 may be representative of such glassy crater floor material, which is most probably sediment consolidated by the impacts that formed the craters. Alternatively, the sample could be part of a secondary projectile that formed the small crater.

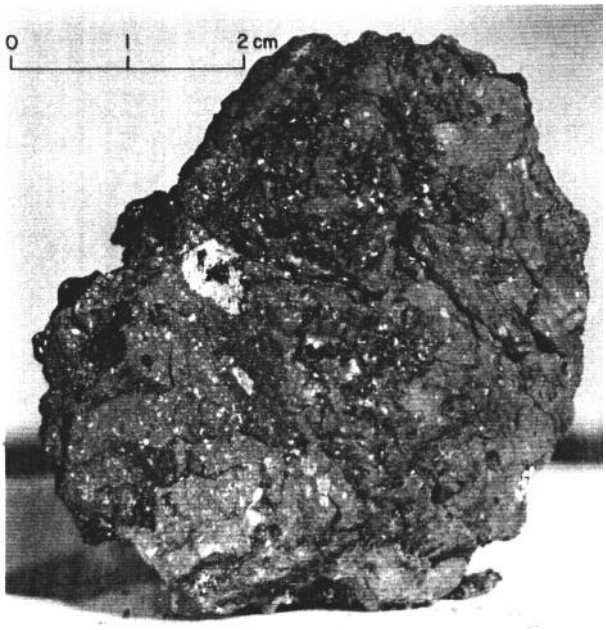

FIGURE 14.-Sample 70018. Impact-consolidated polymict breccia. Irregular glass selvage. (NASA photograph S-73-15330.)

Petrographic description: Polymict breccia with clasts of basalt, glass, and mineral fragments in a finegrained moderately coherent matrix.

Sample 70019

Type: Impact-fused, polymict breccia with a glassy matrix.
Size: 13X6X6 cm.
Weight: 159.9 g.
Location: About 100 m west of the LM on the floor of a 3-m crater. Precise location of the crater is unknown.
Illustrations: Figures 15,16 (LRL).
Comments: Sample is from the floor of a shallow 3-m crater; the floor, wall, and rim are covered by glassy clods approximately 2 to 8 cm in diameter. The clods were formed from local regolith by the impact that produced the small crater. This is one of a number of such small glassy craters noted by the crew.
Petrographic description: Polymict breccia with a glassy matrix. Clasts in the size range 0.1 to 1.0 mm are in the approximate proportions: 7 percent glass, 12 percent plagioclase, 40 percent clinopyroxene, 2 percent olivine, 15 percent opaque minerals, 13 percent basalt, 7 percent fine-grained feldspathic hornfels, 4 percent recrystallized mineral grains.

Major-element composition:

Chemical analyses of 70019

	1	2	3
SiO_2	40.66	41.5	41.1
Al_2O_3	12.38	12.09	12.24
FeO	16.38	16.6	16.5
MgO	9.50	9.60	9.55
CaO	11.03	11.38	11.20
Na_2O	.47	.400	.44
K_2O	.09	.078	.08
TiO_2	8.26	8.31	8.28
P_2O_5	.07	.073	.07
MnO	.24	.222	.23
Cr_2O_3	.43	.437	.43
Total	99.51	100.690	100.12

1. 70019,28 (Rose and others, 1974).
2. 70019,29 (Wanke and others, 1975).
3. Average of 1 and 2.

Sample 70035

Type: Olivine basalt.
Size: 23X15X10 cm.
Weight: 5,765g.
Location: Sample was collected from a large partly buried boulder about 45 m northeast of the LM.
Illustrations: Pans 5, 6, 7, 11; figures 17, 18 (LRL), 26.
Comments: Sample was broken from a 1.5-m boulder on the rim of a shallow 25-m crater. Only the uppermost part of the boulder, which is coarsely vesicular

basalt with distinct parting planes, projects above the surface.

Petrographic description: Coarse-grained vesicular porphyritic olivine basalt. Aggregates of clinopyroxene and ilmenite set in a locally plumose groundmass of plagioclase, clinopyroxene, ilmenite, and accessory minerals.

FIGURE 15.-Presampling photograph showing glassy polymict breccia fragment 70019 on floor of shallow 3-m crater. (NASA photograph AS 17-145-22186.)

Major-element composition:

Chemical analyses of 70035

SiO_2	37.84
Al_2O_3	8.85
FeO	18.46
MgO	9.89
CaO	10.07
Na_2O	.35
K_2O	.06
TiO_2	12.97
P_2O_5	.05
MnO	.28
Cr_2O_3	.61
Total	99.43

70035, 1 (Apollo 17 PET, 1973).

Age:

Rb-Sr isochron:

70035,9, 3.82±0.06 b.y. (2a) (Evensen and others, 1973).

70035,6, 3.73±0.11 b.y. (2σ) (Nyquist and others, 1974).

$^{40\text{-}39}$Ar:

70035,6, 3.72±0.07 b.y. (≥2σ) (Stettler and others, 1973).

70035,6, 3.75 ± 0.07 b.y. (≥2σ) (Stettler and others, 1973).

70035, 3.74 b.y. (Eberhardt and others, 1973).

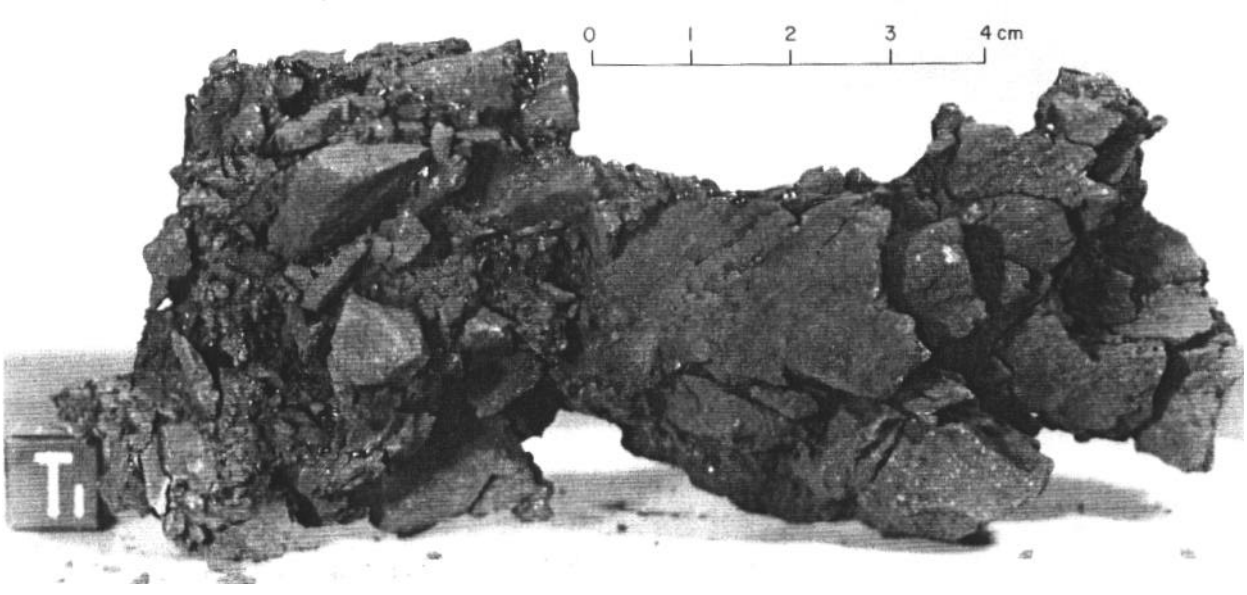

FIGURE 16.-Sample 70019. Impact-fused rock; polymict breccia with glass matrix. (NASA photograph S-73-15333.)

Exposure age:
Ar:
70035,6, 100 m.y. (Stettler and others, 1973).
70035,6, 95 m.y. (Stettler and others, 1973). Ar and Kr:
70035, 100 m.y. (Eberhardt and others, 1973).

Sample 70075

Type: Olivine basalt.
Size: 3X1.7X1 cm.
Weight: 5.64 g.
Location: Unknown.
Illustrations: Figure 19 (LRL).
Comments: 70075 is an aphanitic olivine basalt fragment found in the LM after departure from the lunar surface. Its source at the landing site is unknown.

Sample 70135-39, 45-49, 55-57

Type: Basalt.
Size: 70135, 10.5X6X3.5 cm; 12 additional smaller fragments.
Weight: 70135, 446.3 g; 479.90 g total.

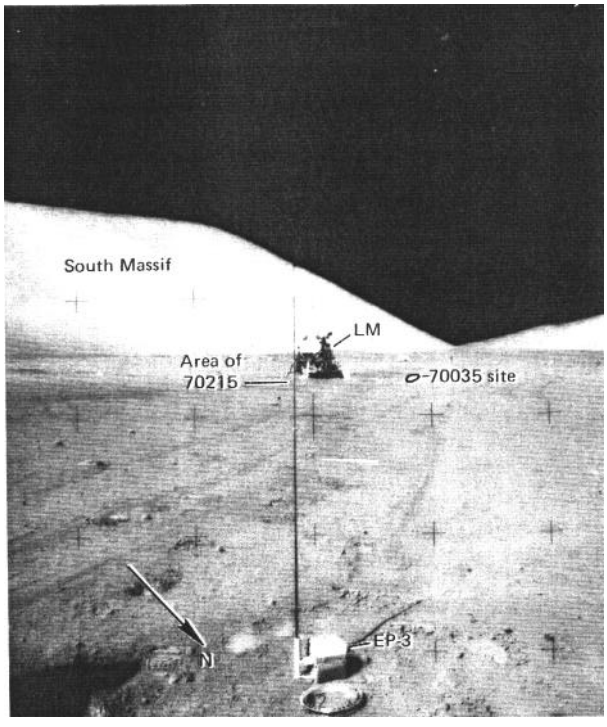

FIGURE 17.-Partly buried 1.5-m boulder from which sample 70035 was collected, and postsampling view of 70215 locality. Explosive package 3 in foreground. (NASA photograph AS 17-143-21937.)

Location: "Geophone rock," 190 m west of the LM in the ALSEP area.
Illustrations: Pans 1, 2, 3; figures 20, 21 (photomicrograph of 70135).
Comments: The samples were collected from a large basalt boulder, Geophone rock, that may have been ejected from Camelot crater to the west or from one of the large craters to the south or east. The boulder, which is one of a small number of basalt boulders in the vicinity of the ALSEP, projects about 3 m above the surface.
Petrographic descriptions:
70135, coarse-grained vesicular porphyritic basalt. Aggregates of clinopyroxene-ilmenite in an ophitic groundmass of plagioclase, clinopyroxene, ilmenite, and accessory minerals.
70136 and 70137, medium-grained porphyritic basalt. Aggregates of clinopyroxene-ilmenite in a locally plumose(?) groundmass of plagioclase, clinopyroxene, and ilmenite.

Major-element composition:

Chemical analyses of 70135

	1	2	3	4
SiO_2	38.60	37.68	37.85	38.04
Al_2O_3	8.88	7.53	7.34	7.92
FeO	18.97	19.74	19.68	19.46
MgO	9.45	10.00	9.29	9.58
CaO	9.82	9.80	10.18	9.93
Na_2O	.36	.40	.34	.37
K_2O	.06	.051	.09	.07
TiO_2	13.33	13.83	13.34	13.50
P_2O_5	.04	.077	.07	.06
MnO	.29	.260	.29	.28
Cr_2O_3	.49	.636	.55	.56
Total	100.29	100.004	99.02	99.77

1. 70135, 33 (Rose and others, 1975).
2. 70135, 41 (Duncan and others, 1976).
3. 70135, 27 (Rhodes and others, 1976).
4. Average of 1 through 3.

Age: Rb-Sr isochron: 70135,27, 3.75±0.06 b.y. (2o) (Nyquist and others, 1975).
Exposure age: Kr-Kr: 106±4 m.y. (Arvidson and others, 1976a).

Sample 70160-61, 65

Type: Sedimentary, unconsolidated (70160-64) and basalt fragment (70165).
Weight: 316.17 g, including 2.14-g basalt fragment (70165).
Depth: Estimated 0-5 cin.
Location: Collected from the fillet of sediment banked against the east base of a boulder in the ALSEP area.

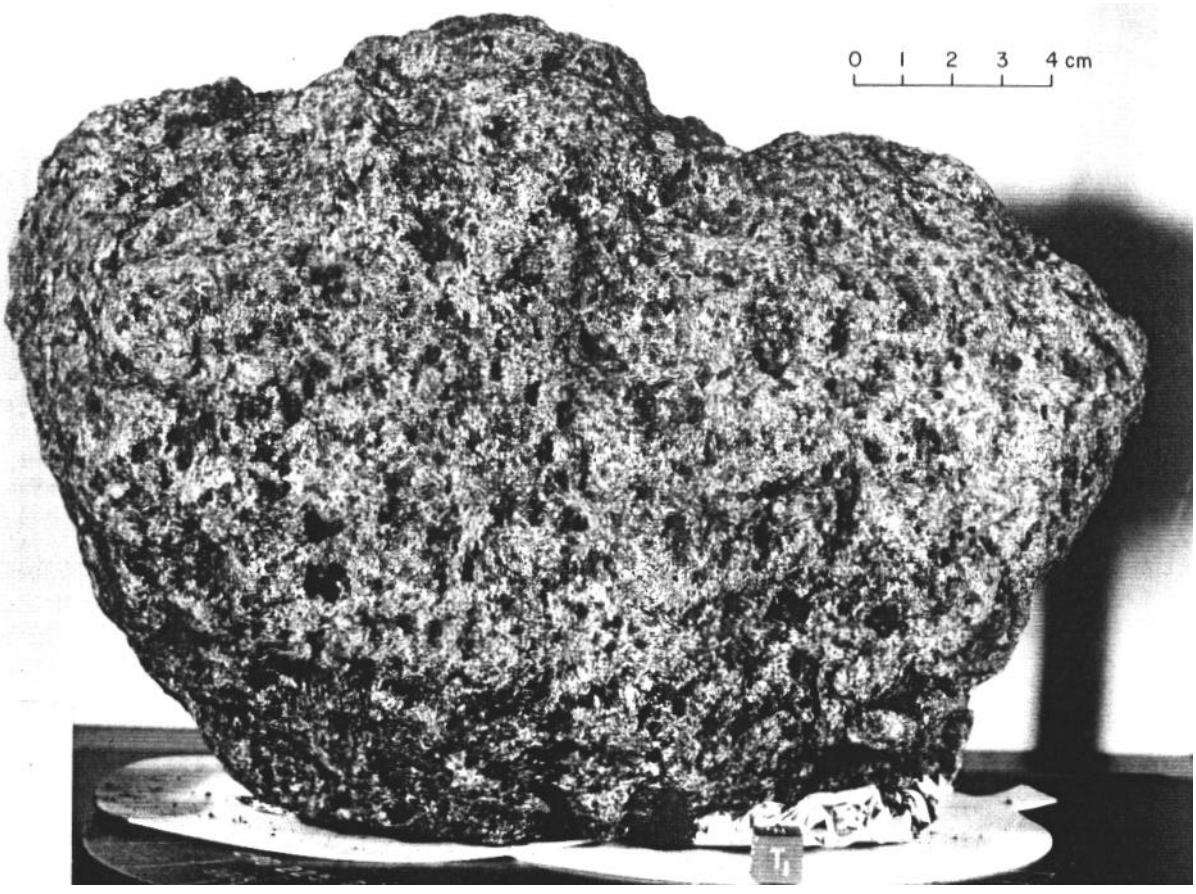

FIGURE 18.-Sample 70035. Coarse-grained vesicular olivine basalt. NASA photograph S-72-56441.)

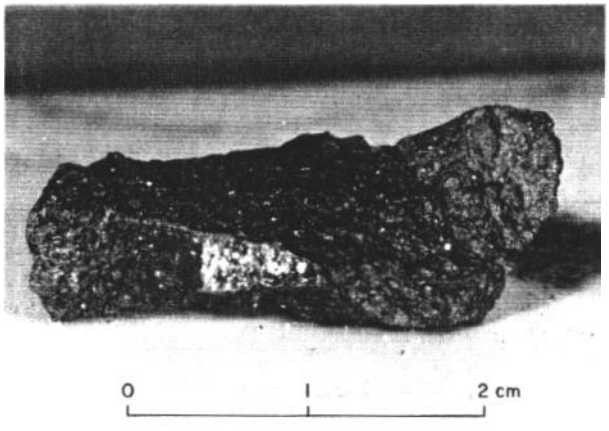

FIGURE 19.-Sample 70075. Aphanitic olivine basalt. (NASA photograph S-73-21768.)

Illustrations: Pans 1, 2, 3; figure 22.

Comments: The fillet probably represents regolith material, including basalt fragments, that has been heaped against the boulder as ballistic ejecta from nearby impacts.

Petrographic description: 7016064, dominantly basalt with feldspar plutonic derivatives, breccia, and agglutinate fragments.

Components of 90-150-jum fraction of 70167,1 (Heiken and McKay, 1974)

Components	*Volume Percent*
Agglutinate	34.0
Basalt, equigranular	15.0
Basalt, variolitic	
Breccia:	
Low grade[1] - brown	5.0
Low grade[1] - colorless	--
Medium to high grade[2]	2.0
Anorthosite	--

Components of 90-150-um fraction of 70161,1 (Heiken and *McKaY, 1974*)-Continued

Components	*Volume Percent*
Cataclastic anrthosite[3]	--
Norite	--
Gabbro	--
Plagioclase	9.0
Clinopyroxene	21.6
Orthopyroxene	--
Olivine	.3
Ilmenite	5.0
Glass:	
Orange	2.0
"Black"	5.2
Colorless	.3
Brown	.6
Gray, "ropy"	--
Other	--
Total number of grains	300

1. Metamorphic groups 1-3 of Warner (1972).
2. Metamorphic groups 4-8 of Warner (1972).
3. Includes crushed or shocked feldspar grains.

Major-element composition:

Chemical analyses of 70161

SiO_2	
Al_2O_3	11.60
FeO	17.01
MgO	9.79
CaO	10.98
Na_2O	.32
K_2O	.08
TiO_2	8.99
P^2O^5	.08
MnO	.23
Cr_2O_3	.46
Total	98.88

70161, 3 (Apollo 17 PET, 1973).

Sample 70175

Type: Sedimentary, impact- consolidated polymict breccia.
Size: 9X6X6 cm.
Weight: 339.6 g.
Location: ALSEP area, approximately 5 m south of deep core site.
Illustrations: Pans 1, 2, 3; figures 11, 23 (LRL).
Petrographic description: Polymict breccia with dominantly basalt clasts, some feldspathic plutonic derivatives, and mineral fragments in a friable matrix.

Sample 701130-84, 85

Type: Sedimentary, unconsolidated (70180-84); basalt (70185).
Size: 70185, two pieces, 9X7.5X5.5 cm; 3.2X2.3Xl.5 cm.
Weight: 70180-84, 259.78 g; 70185, 466.6 g.
Depth: 70180-84, 0-5 cm.
Location: ALSEP area, 3 m to east of deep core site.
Illustrations: Pans 1, 2, 3; figures 24, 25 (LRL).
Comments: The samples come from the predominantly fine sediment of the valley floor regolith near the rim of a 0.5-m crater and just outside of the trampled area surrounding the deep core site. The sediment (70180-84) was collected specifically for comparison with the deep core. The rock (70185), one of

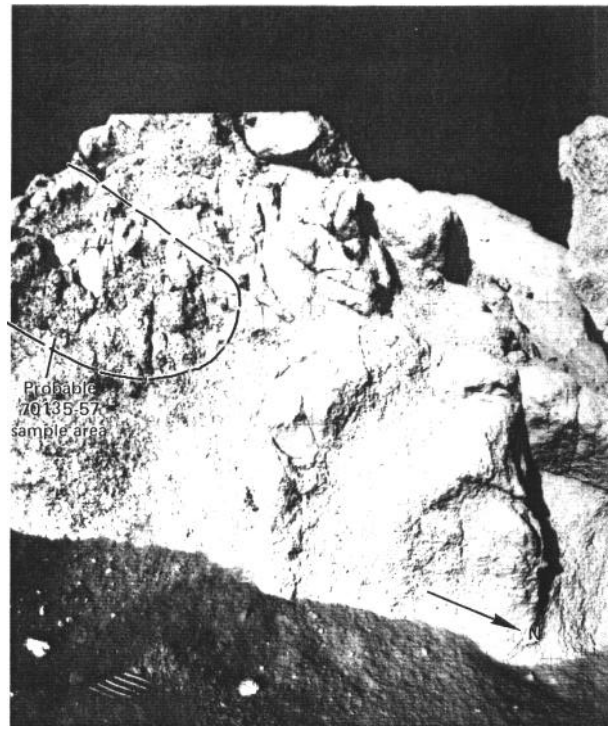

FIGURE 20.-Geophone rock before sampling, showing probable area from which basalt fragments 70135-57 were collected. (NASA photograph AS17-147-22536.)

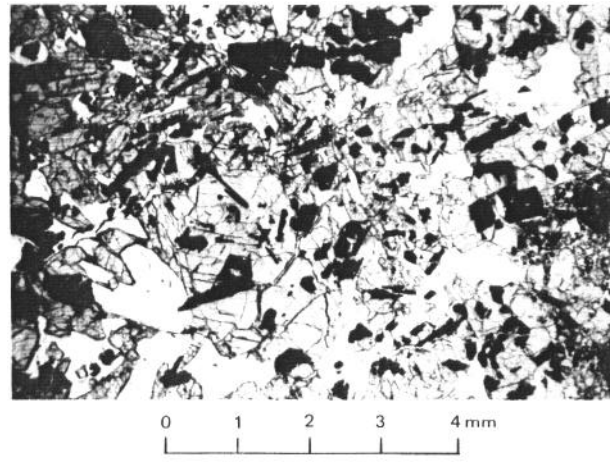

FIGURE 21.-Sample 70135. Photomicrograph showing aggregate of clinopyroxene-ilmenite (left center) in groundmass with plumose intergrowths of phigioclase and clinopyroxene.

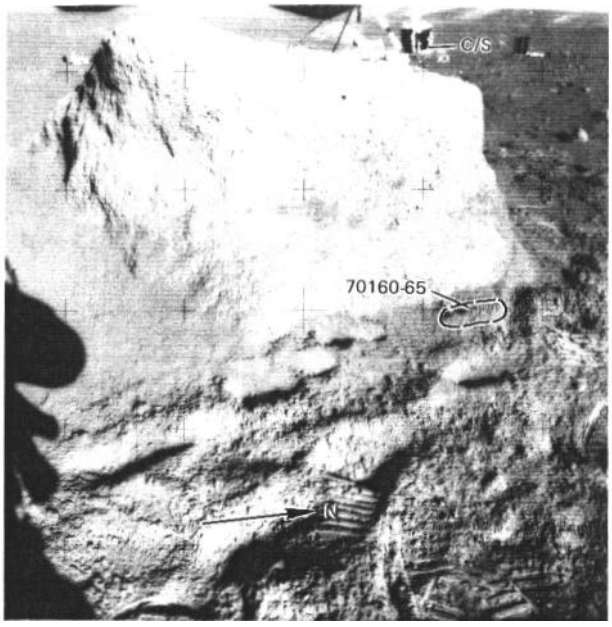

FIGURE 22.-Sample 70160-65 site, after sampling, in fillet at base of 1.5-m boulder near ALSEP central station (C/S). Sediment near boulder has been trampled, and some may have been kicked up onto boulder. (NASA photograph AS 17-136-20718.)

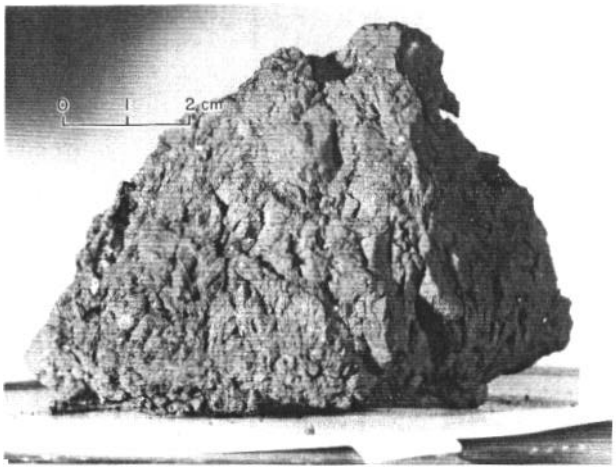

FIGURE 23.-Sample 70175. Impact-consolidated polymict hreccia with distinctive fracture pattern. (NASA photograph S-73-15345.)

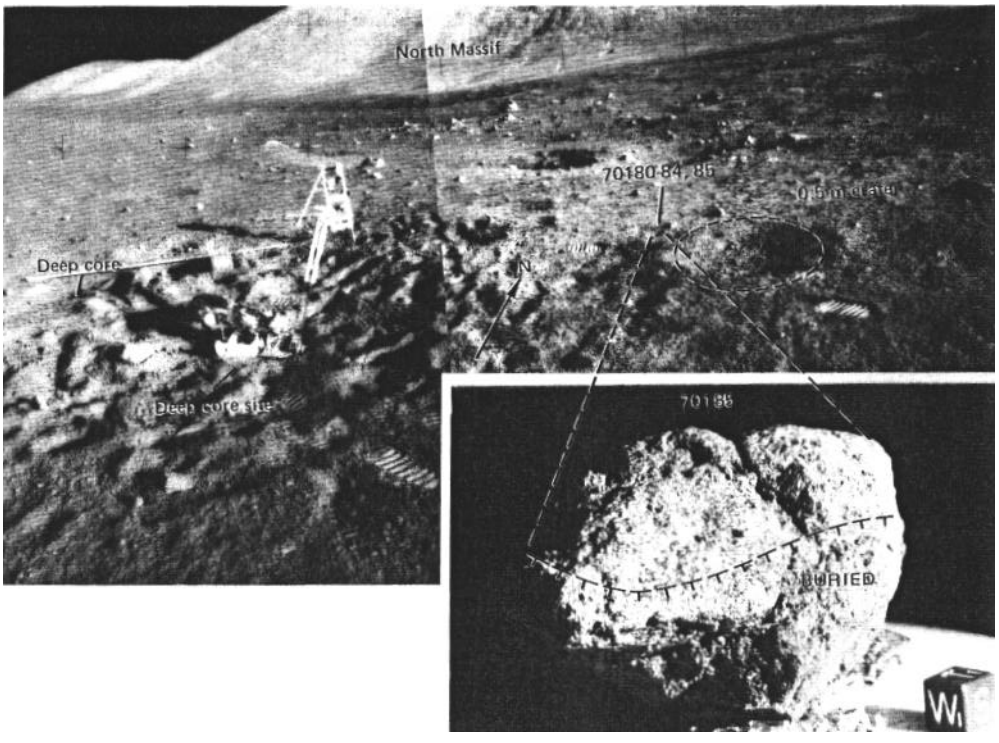

FIGURE 24.-Sample 70180-85 before collection, 3 m east of deep core (sample 70001-70009) site. Inset is LRL view showing 70185 with reconstructed lunar surface orientation and lighting. (NASA photographs AS17-136-20720 and 20721;S-73-17797.)

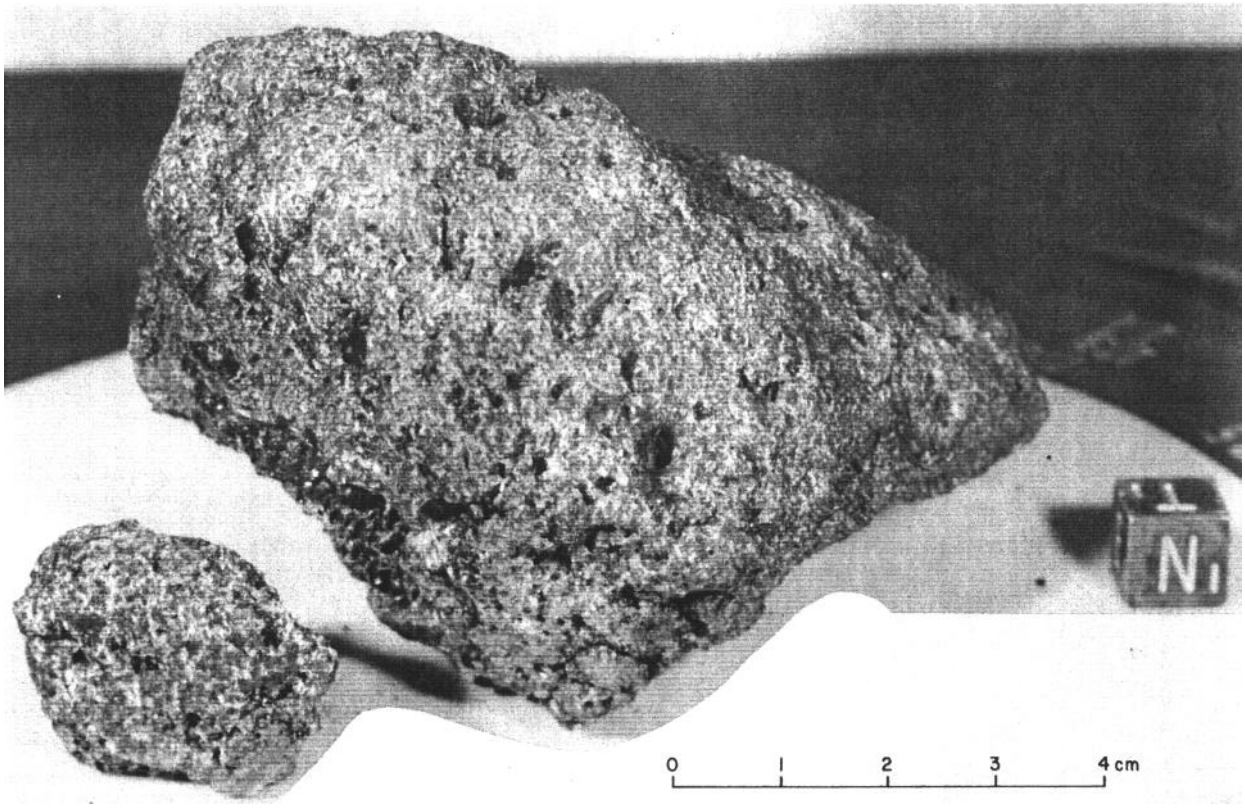

FIGURE 25.-Sample 70185. Fine-grained vesicular basalt. (NASA photograph S-73-15872.)

the many basalt fragments in the valley floor regolith, broke into two pieces before unpacking in the Lunar Receiving Laboratory.

Petrographic descriptions:

70180-84, dominantly basalt and agglutinate fragments.

Components of 90-150-pm fraction of 70181,1 (Heiken and McKay, 1974)

Components	*Volume Percent*
Agglutinate	56.0
Basalt, equigranular	14.0
Basalt, variolitic	
Breccia:	
Low grade[1] - brown	4.6
Low grade[1] - colorless	.3
Medium to high grade[2]	2.6
Anorthosite	--
Cataclastic anrthosite[3]	.3
Norite	--
Gabbro	--
Plagioclase	4.3
Clinopyroxene	10.3
Orthopyroxene	.3
Olivine	--
Ilmenite	2.3
Glass:	
Orange	3.0
"Black"	.6

Components of 90-150-um fraction of 70181,1 (Heiken and McKay,1974) -Continued

Components	*Volume Percent*
Glass-continued	
Colorless	.3
Brown	.6
Gray, "ropy"	--
Total number of grains	300

1. Metamorphic groups 1-3 of Warner (1972).
2. Metamorphic groups 4-8 of Warner (1972).
3. Includes crushed or shocked feldspar grains.

70185, fine-grained vesicular basalt. Scarce aggregates of clinopyroxene - ilmenite in a subophitic(?) groundmass of plagioclase, clinopyroxene, ilmenite, and accessory minerals.

Major-element compositions:

Chemical analyses of 70181 and 70185

	1	2	3	4
SiO_2	40.87	40.90	40.88	40.18
Al_2O_3	12.30	12.35	12.35	9.04
FeO	16.37	16.55	16.46	17.64
MgO	9.82	9.76	9.79	8.11
CaO	11.05	10.97	11.01	11.95

Chemical analyses of 70181 and 70185 - Continued

	1	2	3	4
Na_2O	.35	.38	.36	.39
K_2O	.08	.09	.08	.04
TiO_2	8.11	8.40	8.26	11.52
P_2O_5	.06	.07	.06	.02
MnO	.24	.21	.22	.26
Cr_2O_3	.44	.46	.45	.40
Total	99.69	100.19	99.92	99.55

1. 70181, 3 (Apollo 17 PET, 1973).
2. 70181, 18 (Rose and others, 1974).
3. Average of 1 and 2.
4. 70185,32.(Rhodes and others, 1976).

Exposure age: Minimum track density: 70181, 100 m.y. (Fleischer and Hart, 1974).

Sample 70215

Type: Olivine basalt.
Size: 23X13X10.5 cm.
Weight: 8,110 g.
Location: Approximately 65 m east of the LM, between the LM and the SEP site.
Illustrations: Pans 6, 7, 11; figures 17, 26, 27 (photomicrograph).
Comments: The largest rock collected on the mission, 70215 is a boulder of subfloor basalt from the regolith.

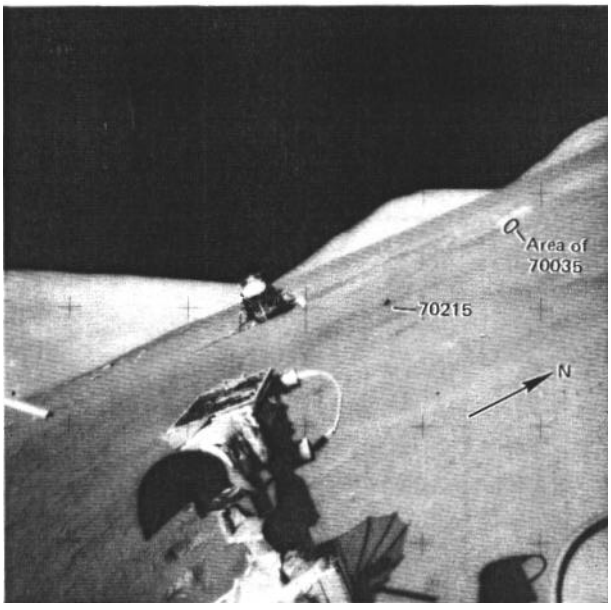

FIGURE 26.-Tilted view from LRV (television camera in foreground) of LM area and 70035 and 70215 sample sites. Astronaut had upended rock 70215 before taking photograph. (NASA photograph AS 17-143-21926.)

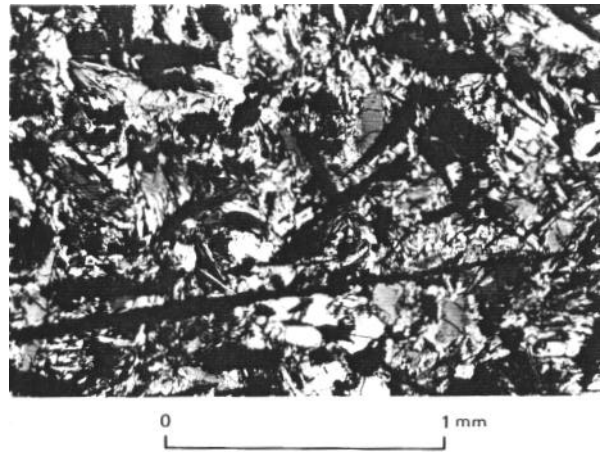

FIGURE 27.-Sample 70215. Photomicrograph showing subvariolitic texture of basalt. Minerals are olivine, clinopyroxene, plagioclase, and thin plates of ilmenite.

Petrographic description: Fine-grained olivine basalt with microphenocrysts of olivine, ilmenite, and clinopyroxene in a subvariolitic groundmass of plagioclase, clinopyroxene, ilmenite, and accessory minerals.

Major-element composition:

Chemical analyses of 70215

	1	2	3	4	5	6
SiO_2	37.19	37.91	38.46	38.3	37.62	37.9
Al_2O_3	8.67	8.86	9.01	8.71	8.79	8.81
FeO	19.62	19.96	19.40	19.9	19.22	19.62
MgO	8.52	7.99	7.91	8.32	9.34	8.42
CaO	10.43	10.77	10.94	10.63	10.82	10.72
Na_2O	.32	.38	.42	.369	.31	.36
K_2O	.04	.041	.05	.045	.08	.05
TiO_2	13.14	13.08	12.48	12.53	13.20	12.89
P_2O_5	.09	.114	.10	.101	.07	.10
MnO	.28	.264	.29	.252	.27	.27
Cr_2O_3	.42	.431	.39	.396	.41	.41
Total	99.72	99.800	99.45	99.553	100.13	99.55

1. 70215,2 (Apollo 17 PET, 1973).
2. 70215,55 (Duncan and others, 1974).
3. 70215,56 (Rhodes and others, 1974).
4. 70215,61 (Wanke and others, 1975).
5. 70215,73 (Rose and others, 1974).
6. Average of 1 through 5.

Age: $^{40\text{-}39}$Ar: 70215,21, 3.84±0.04 b.y. (Kirsten and Horn, 1974).
Exposure age: Ar: 70215,21, 100±12 m.y. (Kirsten and Horn, 1974).

Sample 7025)

Type: Olivine basalt.
Size: Two mated pieces, 7.5X5.5X4.5 cm; 5.5X3.5X3

Weight: 277.2 g.
Location: 2 m south of SEP.
Illustrations: Pan 11, figures 28, 29 (LRL).
Comments: Sample was collected from the rim of a 0.5-m crater. The rock may have been excavated from the regolith when the crater was formed.
Petrographic description: Fine-grained olivine basalt. Scarce olivine microphenocrysts in an intersertal or vitrophyric groundmass.

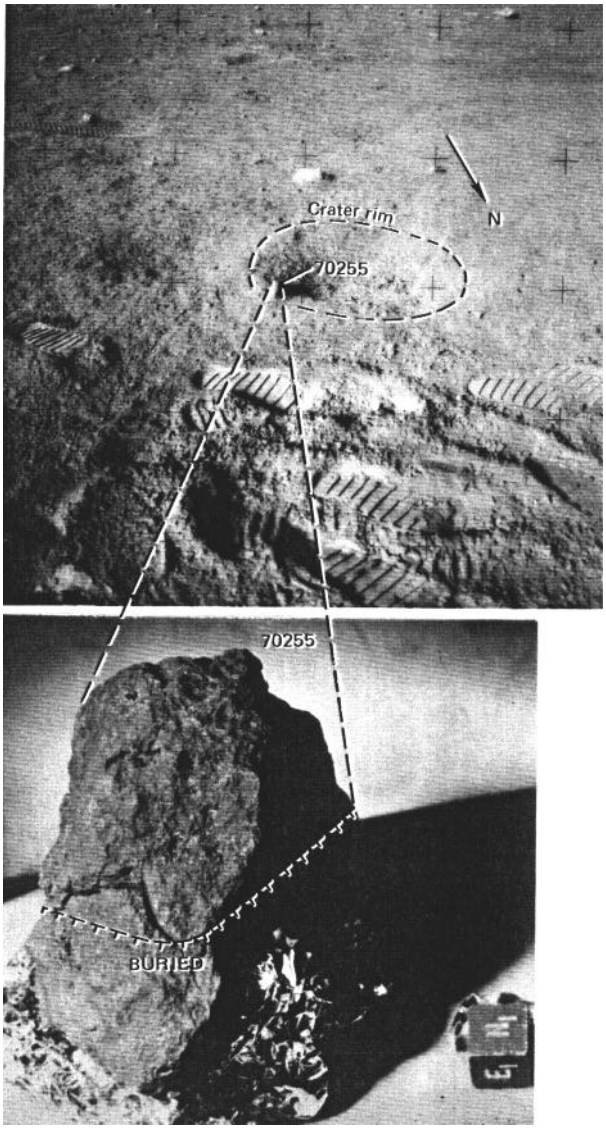

FIGURE 28.-Top, view of sample 70255 before collection from rim of small crater. Bottom, LRL view showing sample with reconstructed lunar surface orientation and lighting. (NASA photographs AS 17-135-20535; S-73-21974.)

Major-element composition:

Chemical analyses of 70255

SiO_2	40.11
Al_2O_3	9.02
FeO	18.73
MgO	7.63
CaO	11.30
Na_2O	.39
K_2O	.05
TiO_2	11.41
P^2O^5	.04
MnO	.29
Cr_2O_3	.34
Total	99.31

70255, 3 (Rhodes and others, 1976).

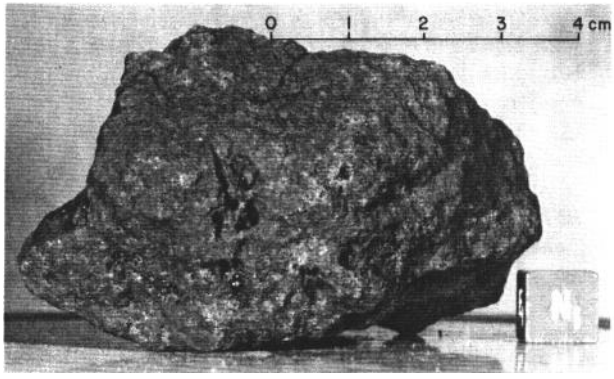

FIGURE 29.-Sample 70255. Fine-grained olivine basalt. (NASA photograph S-73-24088.)

Sample 70270-74, 75

Type: Sedimentary, unconsolidated (70270-74) and olivine basalt (70275).
Sire: 70275, 6.5X5.0X3.5 cm.
Weight: 70270-74, 193.32 g; 70275,171.4 g.
Location: About 10 m southeast of SEP.
Illustrations: Pan 11, figures 30, 31 (photomicrograph).
Comments: Rock 70275 is a basalt fragment from the regolith; sediment 70270-74 was scooped with the rock.
Petrographic descriptions:
70270-74, unconsolidated sediment, dominantly basalt with agglutinate, glass, and breccia fragments.
70275, medium-grained olivine basalt. Microphenocrysts of olivine and ilmenite in a variolitic groundmass of plagioclase, clinopyroxene, ilmenite, and accessory minerals.

Major-element composition.:

Chemical analyses of 70275

SiO_2	39.37
Al_2O_3	10.23
FeO	18.61

Chemical analyses of 70275 - Continued

MgO	6.09
CaO	11.65
Na_2O	.38
K_2O	.06
TiO_2	11.90
P^2O^5	.08
MnO	.28
Cr_2O_3	.26
Total	98.91

70275, 3 (Rhodes and others, 1976).

Sample 70295

Type: Sedimentary, weakly lithified polymict breccia.
Size: 12X6X4.8 cm.
Weight: 361.2 g.
Illustration: Figure 32 (LRL).
Location: Collected near the SEP. The precise location is unknown.
Petrographic description: Polymict breccia with clasts of basalt, feldspathic metaclastic rock, feldspathic cataclasite, and mineral debris in a fine-grained friable matrix.

STATION 1

LOCATION

Station 1 is located on the northwestern flank of Steno crater, approximately 150 m from the rim crest (figs. 6, 7*E*; pl. 2). The station was planned for the east rim of 600-m Emory crater. However, shortage of time after completion of activities in the LM/ALSEP/SEP area during EVA 1 required selection of a station area nearer to the LM than had been planned.

OBJECTIVES

The originally planned station was interpreted to be in an area where blocky subfloor material, represented in the Emory crater ejecta, was exposed in a window in the dark mantle. Unusually dark local patches in the Emory area were considered to represent possibly

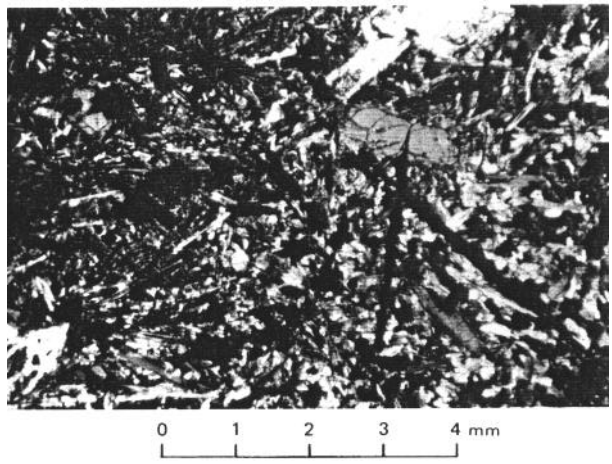

FIGURE 31.-Sample 70275. Photomicrograph showing variolitic texture with fan-shaped intergrowths of clinopyroxene, plagioclase, and ilmenite, larger microphenocrysts of olivine, and thin plates of ilmenite

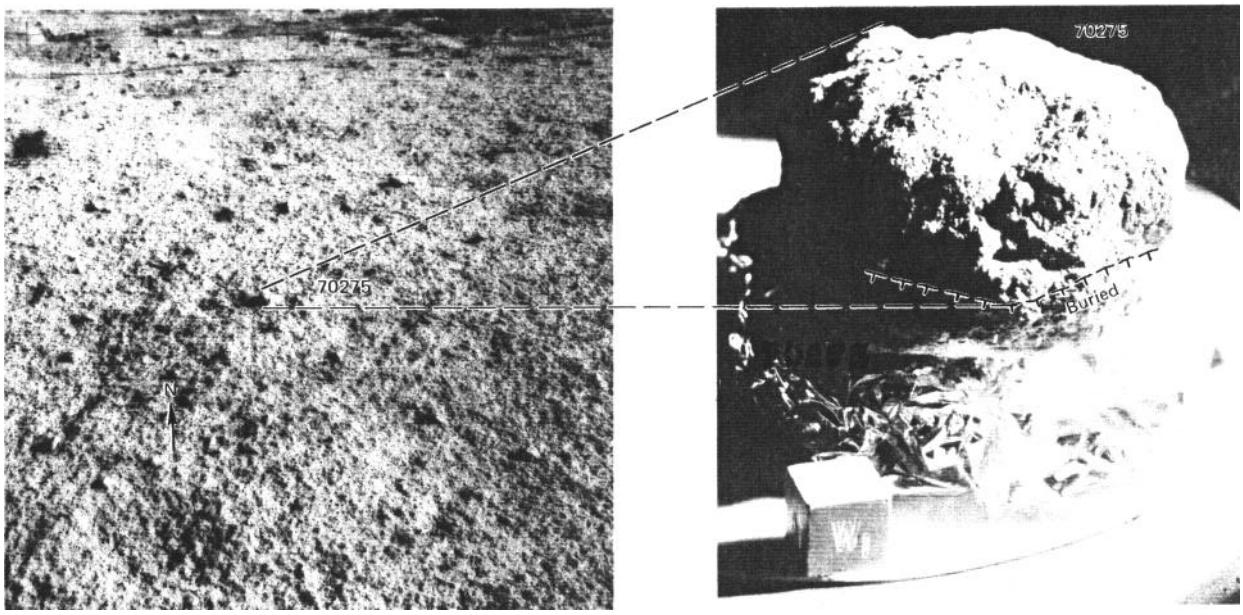

FIGURE 30.-Left, sample 70275 on lunar surface. (NASA photograph AS17-135-20540.) Right, LRL view showing 70275 with reconstructed lunar surface orientation and lighting. (NASA photograph S-73-21388.)