

NOTES - EXTENDED COMMENTS

Note	By/date
	<p>S.R.Waltz 4/10/75 <u>Overall description</u> *</p> <p>First impression is a "sugary" texture with crusty clods. The bottom end is obviously more compacted and has the greater likelihood of not having been disturbed when unconfined. Binocular observation shows a great abundance of small glass and plagioclase particles which makes the soil appear to sparkle. The glass particles vary in color from dark to green to orange. The plagioclase fragments are translucent with gradation in shocked appearance to chalky white anorthosite. Breccias are found, but a definite preponderance of agglutinates^F is evident. Some dark particles may not be glass, but ilmenite. Many whole beads can be found, but at very small scale. The crust or rind which "normally" develops at the soil/tube contact is discontinuous, probably due to loose confinement of the soil in the tube. The bottom end for about 7 cm shows "normal" platelets with deep fissures (one in particular) at the very bottom. The x-ray shows a large particle at about 38 or 39 cm -- this may account for the radiating fracture pattern at that position. The rind has closed fissures from 34.5 to 36.0 -- possibly due to loose soil filling or a change in the nature of the soil. The rind stops at 30 cm and briefly reappears between 25 and 28 cm. Small pieces of rind are found throughout the length of the core -- which indicates that the rind was developed during the actual drilling and subsequently broken up when the loose plug allowed the soil to shift. If this is the case, the bottom 10 cm or so is probably intact and possibly partially intact as high as 25 cm. The top 10 cm was undoubtedly slumped as far as 0 cm and then restored to the same general configuration. Any layering or particle orientation would be meaningless except possibly in the most general sense-in that we know its position within 10 cm. As far as tonal contrasts, the bottom end is definitely lighter -- but not as much as that due to the albedo (due to the platelets) would indicate. Larger particles are seen at 27 cm and below 30 cm, although no real indication or relative coarseness is evident. Slumped soil at the top end exposes no particles as great as 1 mm however, and this agrees with the x-ray interpretation. The soil matrix is obviously coarser than that of the Apollo 16 drill string. Under magnification, the soil matrix has a "salt and pepper" appearance with about 20% dark particles smaller than 4 phi. Shiny flecks (glass and plagioclase) impart a phyllitic sheen on fracture faces of soil clods.</p> <p>^F GLASS-COATED SOIL BRECCIAS - NOT TRUE AGGLUTINATES</p> <p>*SEE PHOTO COMPOSITE AND X-RAY INTERPRETATION DRAWINGS.</p>

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	<p>S.R.Waltz 4/11/75 <u>Description by "zone" of the soil surface</u></p> <p>Starting at the lunar surface (or 15 cm reference*), the soil is nearly all a silty matrix with very few particles as large as 1 mm. Dark particles with a specular luster and a few glass beads can be seen. Plagioclase and anorthositic particles are sprinkled throughout. Platelets and clods are scattered randomly.</p> <p>At ~21.2 cm the platelets (if any) are indistinct and some particles greater than 1 mm are seen -- many of which are agglutinates.**</p> <p>At ~24.5 cm the platelets become semi-continuous while large particles remain in evidence.</p> <p>At ~27.9 cm both the platelets and side-slumping are reduced. A few large particles (mostly agglutinates† in the 1-2 mm range) can be found.</p> <p>At ~30.1 cm the platelets resume in a continuous, nearly complete side-to-side coverage. Large (3-4 mm) blocky basalt chunks are seen, also some agglutinates.**</p> <p>In comparison to the x-ray interpretation‡, the two top units (63 & 64) are indistinguishable. Unit 62 matched quite closely in thickness, but is shifted higher. Unit 61 has the same thickness but is also shifted higher. Unit 60 is thinner and shifted. Unit 59 is thicker. In general, the basis for "zone" distinction is the extent and condition of rind platelets and presence or absence of large particles. Tonal changes are not significant enough to make distinctions. Size distribution found by dissection offers a parameter for making distinctions in regard to the x-ray interpretation.</p> <p style="text-align: center;"><u>Special features</u></p> <p>Blocky "basalt" chunks at 34.8 and 31.4 cm.</p> <p>Glass "plate" at 34.9 cm.</p> <p>Glass-coated semi-spherical particle at 31.3 cm.</p> <p>Agglutinates** at 36.7 and 22.3 cm.</p> <p style="text-align: center;"><u>Proposed dissection plan</u></p> <p>As no special distinctions can be made from preliminary observations, dissection should proceed according to standard procedures. Also, in view of the disturbed nature of the soil, any attempted interpretation of layering (especially at the top) would likely introduce sampling bias which might cloud analytical interpretation.</p>

* SEE PHOTO COMPOSITE AND X-RAY INTERPRETATION DRAWING.

† SEE COMPARISON DRAWING..

** GLASS-COATED SOIL PARTICLES

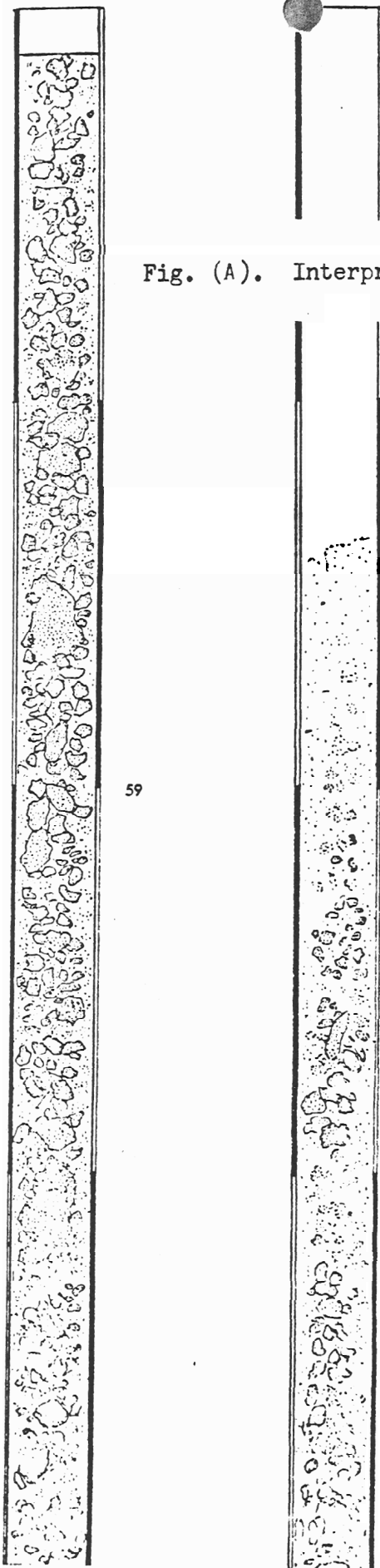


Fig. (A). Interpretation of X-radiographs from Apollo 17 deep drill string.

Unit 64 Depth, TDS 15 - 18 cm. Depth, Lunar Surf. 0 - 3 cm. Thickness - 3 cm.

FINE-GRAINED UNIT WITH TRANSPARENT MATRIX, SCATTERED OPAQUE SPHEROIDS

MATRIX: 100%, high transparency, with approximately 10% density concentrations and semi-opaque granules less than 1 mm diameter, and with 1% opaque spheroids and spheroids ranging from 1 mm diameter to limit of resolution of film. On the X-radiograph, the unit appears to fade out over a 2 cm. distance along the upper margin, because of slumping.

Unit 63 Depth, TDS 18 - 23 cm. Depth, Lunar Surf. 3 - 8 cm. Thickness - 5 cm.

MASSIVE, FINE-GRAINED UNIT WITH COARSE BUT INDISTINCT MOTTLES

MATRIX: 100%, of intermediate to high background transparency, but with 50% to 60% indistinct mottles up to 2 mm diameter, and granular density concentrations, generally less than 1 mm diameter.

Unit 62 Depth, TDS 23 - 26 cm. Depth, Lunar Surf. 8 - 11 cm. Thickness - 3 cm.

FINE-GRAINED INTERVAL WITH SORTED SMALL ROCK FRAGMENTS AND CLOD-LIKE PARTICLES

MATRIX: 75%, relatively opaque because of granularity, represented by 30% semi-opaque density concentrations less than 1 mm in diameter, but with no opaques.
COARSE FRACTION: 25%, of which 15% is semi-opaque rock fragments with distinct outline. Rock fragments are well sorted, 1.5 to 4 mm diameter, and are equant to subequant with irregular, lumpy outlines. 10% is semi-opaque crenulate mottles, less than 5 mm in diameter.

Unit 61 Depth, TDS 26 - 29.5 cm. Depth, Lunar Surf. 11 - 14.5 cm. Thickness - 3.5 cm.

MEDIUM THIN BED WITH ABUNDANT, MIXED ROCK FRAGMENTS

MATRIX: 55%, moderately opaque, but noticeably less opaque than in underlying interval, unit 60, with 20% semi-opaque, granular density concentrations, less than 0.5 mm diameter, no opaques.
FRAMEWORK: 45%, 35% of which is semi-opaque rock fragments with distinct outline. 25% of total (100%) is represented in equant rock fragments with irregular, lumpy, subangular to subrounded outline; these fragments are poorly sorted, ranging from 1 to 9 mm in diameter. The other 10% are elongate chips, splinters, and blocky rock fragments with straight edges, and angular to subangular corners, but these fragments are as poorly sorted as the equant fragments. 10% of interval consists of semi-opaque crenulate mottles, 2 to 6 mm diameter.

Unit 60 Depth, TDS 29.5 - 32.5 cm. Depth, Lunar Surf. 14.5 - 17.5 cm. Thickness - 3 cm.

FINE GRAINED INTERVAL WITH CLOD-LIKE COARSE FRACTION

MATRIX: 80%, relatively opaque, being distinctly granular, with 30% semi-opaque granular density concentrations, less than 1 mm diameter, and with a trace of pinpoint spherical opaques.
COARSE FRACTION: 20%, semi-opaque crenulate mottles and dense concentrations, 2 to 5 mm in diameter, with fairly even size distribution, indicating good sorting if these particles represent rock fragments and not soil clods.

Unit 59 Depth, TDS 32.5 - 106 cm. Depth, Lunar Surf. 17.5 - 79 cm. Thickness - 61.5 cm.
(7.5 cm. of this massive unit is in 70009, the remainder being described in 70007 and 70008.)

MASSIVE UNIT, PACKED WITH POORLY SORTED LARGE ROCK FRAGMENTS

MATRIX: 50%, moderate to low transparency, with 30% to 50% fine, semi-opaque granules less than 1 mm diameter, and a trace of opaque spherules, 0.5 mm diameter to limit of resolution.
FRAMEWORK: 50%, 40% of which is semi-opaque rock fragments with distinct outline, 1 mm to 2.5 cm. diameter. Fragments are very poorly sorted, mostly equant to ovoid-elongate, with blocky or irregularly polygonal outline, angular to subangular corners. 50% semi-opaque density concentrations with indistinct outline, but fading out smoothly to slightly unevenly, not over strongly crenulate margins.