LAYERED AND FACETED FORMS IN PANORAMAS OBTAINED FROM THE LUNA-9 STATION

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As was indicated in the publication *The First Panoramas of the Lunar Surface* ([1]), the panoramas obtained from the Luna-9 station reveal complex structures of characteristic and repeated forms. In particular, the presence is noted of formations that can be characterized as "small, as it were flat areas" ("facets"), grouped into three-dimensional structures—complex polyhedra ([1] part II, ch. II).

In many places in the photographs, straight-line boundaries between light and shadow are observed, running in different directions, sometimes perpendicular to the lines of the television raster. These lines intersect several (sometimes up to ten) lines. Such rectilinear shadows can be cast only by objects with straight or flat faces or sides. Thus, by a purely formal examination of the images, the presence of "faceted" elements is revealed.

Figure 1 shows part III of the panorama, with areas containing the indicated forms marked on it. A graphic interpretation of fragment 1 of this panorama is given in Fig. 2.

According to the interpretation presented, the area in Fig. 2 contains at least several "layered structures," bounded by two parallel, almost vertical faces of considerable extent. The ends of these "layers" in some cases do not have a regular form, while in others they form a characteristic "sawtooth" form; in this case the angle between the faces at the peaks and depressions of the "teeth" is close to 120°. The characteristic thickness of the layers is 0.8–1.5 cm; the length of the visible segments of the layers is less definite, but may be estimated at 20–40 cm.

Figure 3 shows, in enlarged form, fragment 2 with a protruding flattened stone and its graphic interpretation. Here two regular "teeth" are clearly visible, as well as two "hollows," apparently created by impacts of falling particles. In the same figure a more extended layer can be discerned, with a sawtooth upper edge, and several thinner layers with edges of irregular form.

Figure 1

Figure 1: Figure 1

Figure 2

Figure 2: Figure 2

A detailed examination of the panoramas reveals a large number of faceted and layered forms; however, many of them are not identified as clearly and definitely as those presented above. The widespread occurrence of faceted and layered structures, and the frequent repetition of characteristic angles close to 90 and 120°, make it possible to suppose a connection between these forms and the mineral composition of the lunar surface.

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[1] *The First Panoramas of the Lunar Surface*, Nauka, 1966.

Fig. 1. Section III of the lunar panorama (sector 120°—165°)

Fig. 2. Graphic interpretation of fragment 1 (Fig. 1). Distance from the center of panoramic scanning 1.5 m, plan-view size 20 × 50 cm

Fig. 3. Fragment 2 (Fig. 1) and its graphic interpretation. Distance from the center of panoramic scanning 1.4 m, plan-view size 6 × 20 cm

Note: Figure translations are in progress. See original paper for figures.

Figure 3

Figure 3: Figure 3