



Figure 28. (a) Thin lamination in Burns formation at Endurance Crater. The thickness of individual laminae was measured normal to the trend of the stratification and compared to terrestrial eolian, fluvial, and base surge deposits. MI image 1M140976848 of Cobble Hill acquired on sol 144 with illumination from upper right. (b) Thin lamination in eolian, wind-ripple strata of the Jurassic Page sandstone, Arizona. (c) Thin lamination in fluvial, upper plane bed deposits of the Mesoproterozoic (1.4 Ga) Mt. Shields formation, Montana. (d) Thin lamination in pyroclastic base surge deposit (Pleistocene), Hunts Hole, New Mexico.

4.1.7.2. Perseverance and Antistasi

[57] These two cobbles are about as bright as the larger, rounded soil grains upon which they sit. “Perseverance” is approximately 10.2 cm long (Figure 26), while “Antistasi” is of indeterminate width (the entire cobble is not viewable in the MI images; Figure 27). These cobbles have a mottled appearance, with darker and lighter irregular areas. The cobble color is heterogeneous, with irregular rhomboid-shaped lighter areas embedded in a darker mass. It is not clear if these are individual coarse clasts in matrix or variations in reflectance stemming from coatings or the result of vagaries in reflection due to illumination angle. All mottled regions of Perseverance are fully interlocking, indicating that if these regions represent coarse grains, this cobble is a breccia. Additionally, dark spots 1–2 pixels in diameter appear on the surface of Perseverance. It is not clear if these spots are mantling soil grains, an artifact, or are integrated into the cobble. However, darker-grained mantling of soil seems the likely explanation. No crystal forms or cavities are evident in either cobble.

[58] Although the luster of Antistasi is difficult to determine because it was imaged while in shadow, the surface texture of Perseverance appears greasy or vitreous, and is heterogeneous, with smooth areas bisected by shallow crevices. The cobble has a blocky appearance, with cracks

and apparent seams running along the surface. This rock appears to have worn and weathered in blocks or sections. Edges have been smoothed and rounded, while pits are visible in the upper shadowed region (Figure 26). Antistasi has a heterogeneous texture in which nodules protrude past the mean surface level, while small pits and larger semicircular cavities result in a very angular surface (Figure 27).

[59] The sphericity of Perseverance is approximately 0.82, which would be considered a high sphericity value in a terrestrial setting. Elongation is approximately 0.69, a somewhat elongate particle. Because a portion of the cobble is not imaged, these values should be considered minimum values, and sphericity and elongation cannot be determined definitively. Quantitative roundness (which depends on the sharpness of clast corners) could not be determined directly for either cobble, but is estimated as angular to subangular, which can be translated to a roundness of 0.17–0.35 [Powers, 1953].

[60] There is no evidence that breakage occurs along grain boundaries or fractures on either cobble, nor do any potential coarse grains exhibit evidence for shattering, conchoidal fracturing, sorting or preferred orientation. Peeling along surfaces of stratification may be indicated by scalloping along a single edge of Perseverance, similar to Arkansas. No lamination is evident on Antistasi.