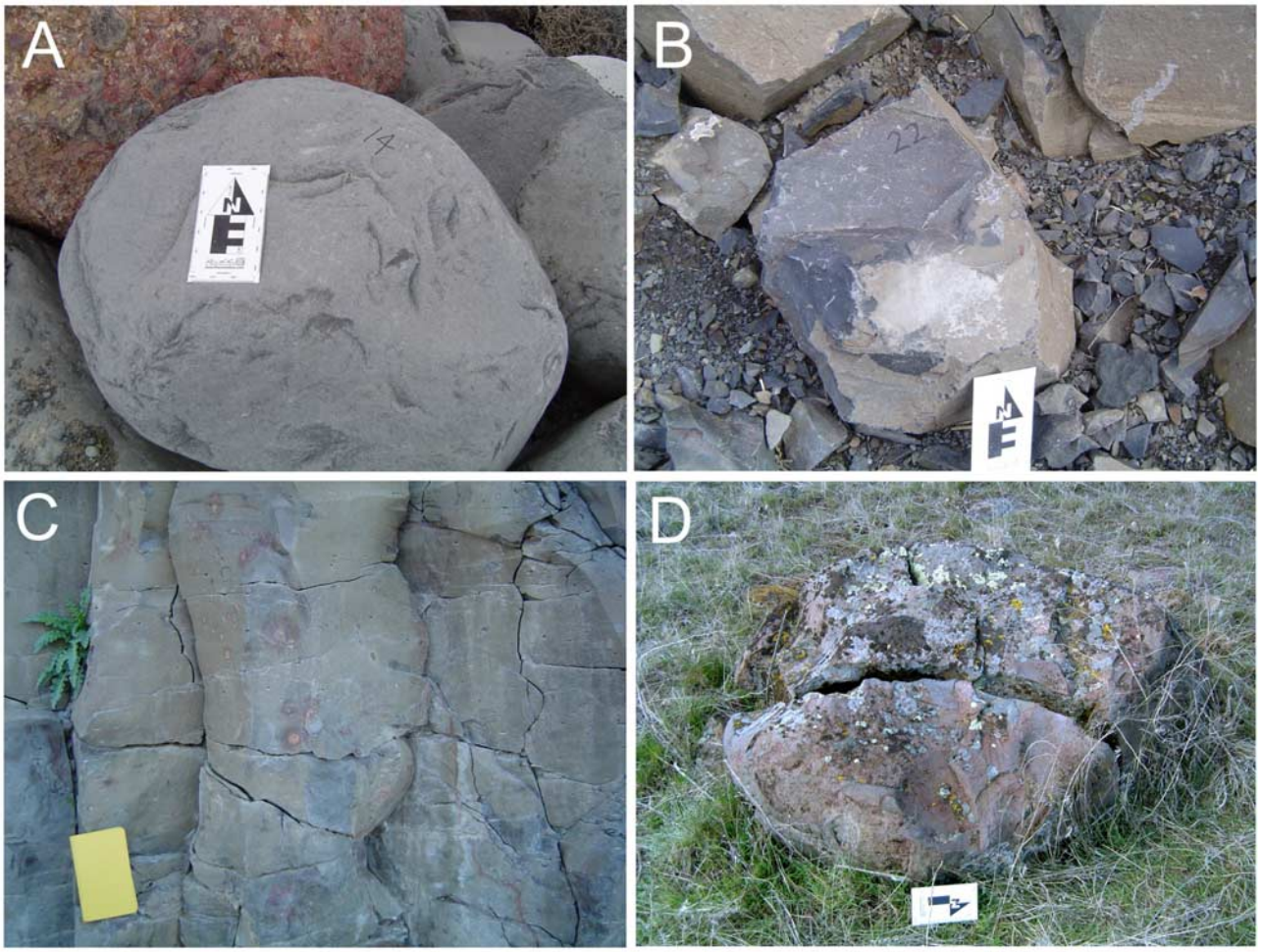

Figure 6. (a) Rounded flood-transported boulder at the quarry site with obvious gouges from flood transport. (b) Angular talus fall boulder at the outcrop site, (c) columnar jointing and perpendicular fracturing on the outcrop face, and (d) boulders exposed at the surface have flood transport features partly obscured by lichen. Detached blocks indicate in situ fracturing. Items for scale in the images are approximately 12 cm.

sections (Figure 7). Quarry boulders have smooth surface-grain interfaces. In contrast, samples from the outcrop have jagged surface-grain interfaces, perhaps because of the effects of granular disintegration. In the fan surface samples, the uppermost layer of grains is highly fractured and in some cases the root-like rhizines of lichen penetrate individual grains. Grain fracturing and red iron oxidation are the most obvious signs of weathering, forming a clear rind. Iron oxidation was absent from the quarry samples but occurred frequently in the outcrop and surface samples either immediately at the surface in a distinct zone of weathering or at depths of a few mm, perhaps because of infiltration of water in subsurface cracks. Iron oxidation appears to be intensified beneath some lichen.

4.2. Morphologic Parameters: Whole Boulder Shape

[36] Examination of whole boulder shape parameters shows some significant differences between boulders at

Table 2. Boulder Breakdown Extent Statistics and Averages per Boulder[a]

		Per Boulder			
	N Sampled	Average Number of Fractures	Average Number of Fractures Above 15 cm	Average Number of Detached Fragments	Schmidt Hammer Rebound
Quarry boulders	15	2.2 ± 2.9	0.9	0	65.2 ± 4.6
Outcrop boulders	11	1.2 ± 1.6	0.3	0.3	58.4 ± 7.1
Surface boulders	20	0.3 ± 0.4	0.2	1.1	55.9 ± 7.1

[a]Values given are mean standard (±standard deviation).