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NOTES

BUBBLE-WALL SHARDS ALTERED TO MONTMORILLONITE

Key Words—Montmorillonite, SEM, Shards, Texture, Volcanic Ash.

Scanning electron micrographs of bentonite from the Amargosa Desert, southern Nevada, show relict bubble-wall shards that have been completely altered to smectite. The micrographs, taken with a JSM U3 scanning electron microscope, are of undisturbed samples from the Ewing and Kinney bentonite deposits, about 13 km and 23 km, respectively, south of Lathrop Wells, Nye Country, Nevada. Detailed studies by Khoury (1978) showed the bentonites to consist of 100% expandable montmorillonite, plus minor amounts of accessory minerals, the most abundant of which is calcite. Transmission electron micrographs of disaggregated samples have been published by Grim and Güven (1978).

The textures shown in Figure 1 are common in both bentonites. The general texture is that of the rounded bubbles shown in Figure 1a, but fish-shaped (Figure 1b) and cigar-shaped (Figure 1c) shards are also abundant. Cracks (desiccation features?) which cut through the bubbles are filled with secondary smectite (Figure 1d). Figure 1e shows that the bubbles are hollow. Photomicrographs of hollow bubble-wall shards have been published by Sheppard and Gude (1968, 1969) for California tuffs. In those tuffs, montmorillonitic pseudomorphs of bubbles are commonly partly or completely filled with authigenic zeolites. Figure 1f is an enlargement of the honeycomb texture also seen in Figure 1e. Honeycombs are commonly found in scanning electron micrographs of montmorillonite (Bohor and Hughes, 1971; Borst and Keller, 1969; Wilson and Pittman, 1977). It is unclear, however, whether or not this delicate texture is an artifact.

Based on these textures, it is obvious that the bentonite deposits formed from volcanic ash, and that they remained undisturbed after the glass bubbles were altered to clay.

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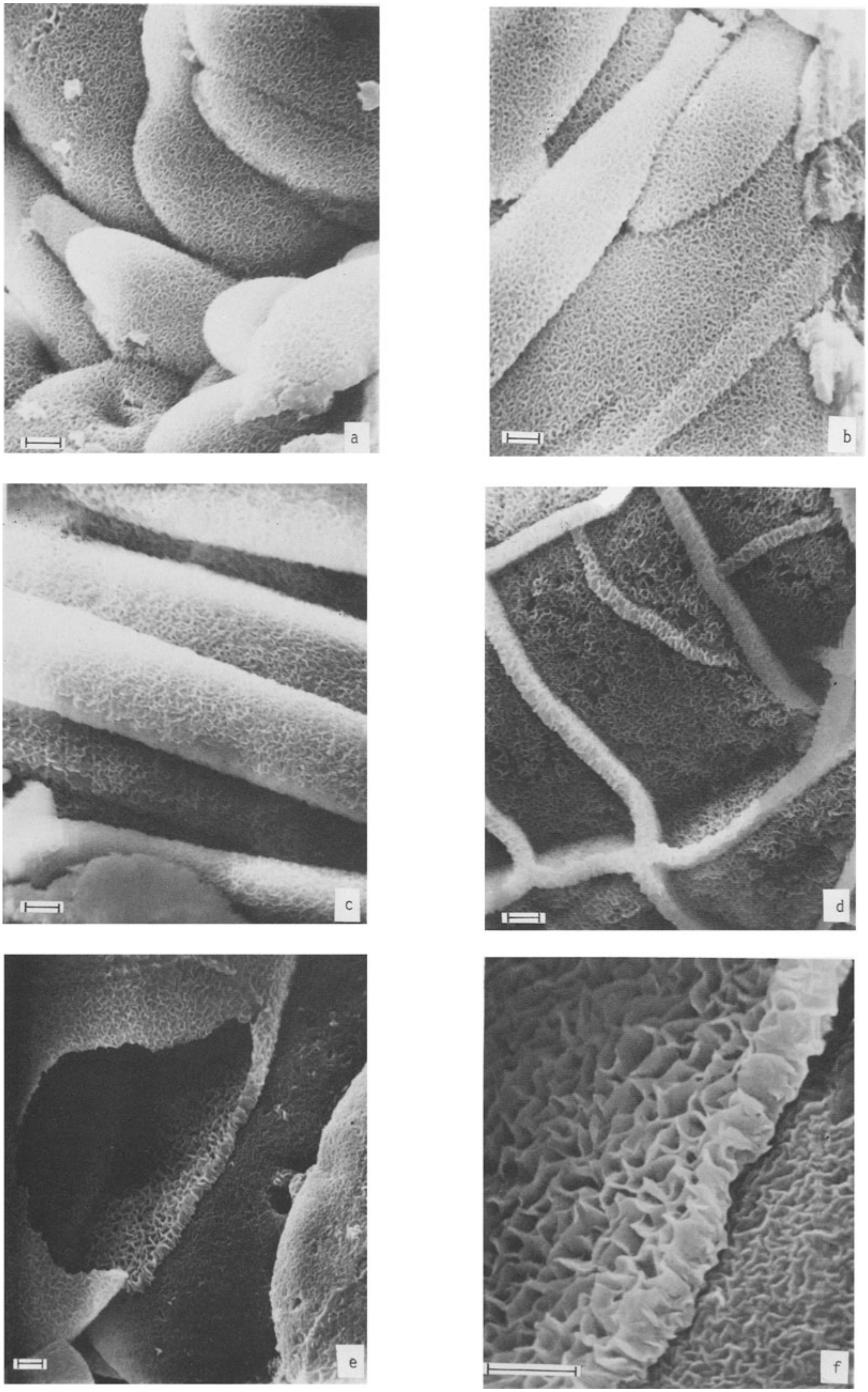
Figure 1. Scanning electron micrographs of undisturbed samples from the Kinney and Ewing bentonites, Nye County, Nevada. The bar is 2 μm. See text for explanation of individual micrographs.



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