Point of Rocks Canyon

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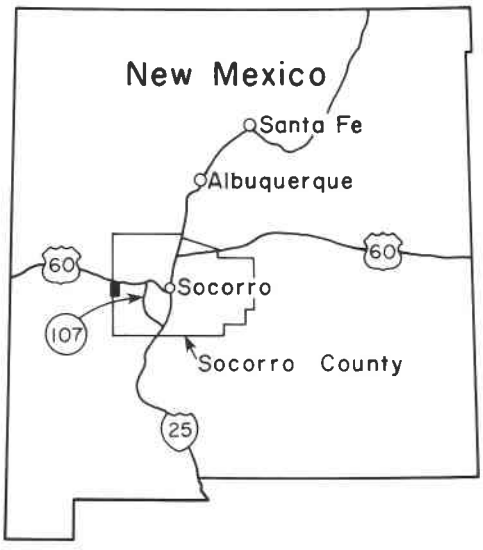

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Point of Rocks Canyon, which is near NM–78 in the northwesternmost corner of the San Mateo Mountains (Socorro County), is much the same today as it was hundreds of years ago when Indians used the caves in its cliffy walls (Fig. 1) as hunting camps or perhaps as primary residences. The Indians probably found the site ideal because there was water nearby, abundant game, and a southern exposure to warm chilly mornings. Their presence is now recorded by occasional finds of pottery shards and flint and obsidian chips; modern visitors have carried away most other transportable relicts. A few metates remain because they are part of the solid rocks of the cliffs themselves.

The soft white stone that forms the ledges, cliffs, and caves in this area is hastily lumped together by most geologists into an all-encompassing "volcanics" or "tuffs" unit. To a

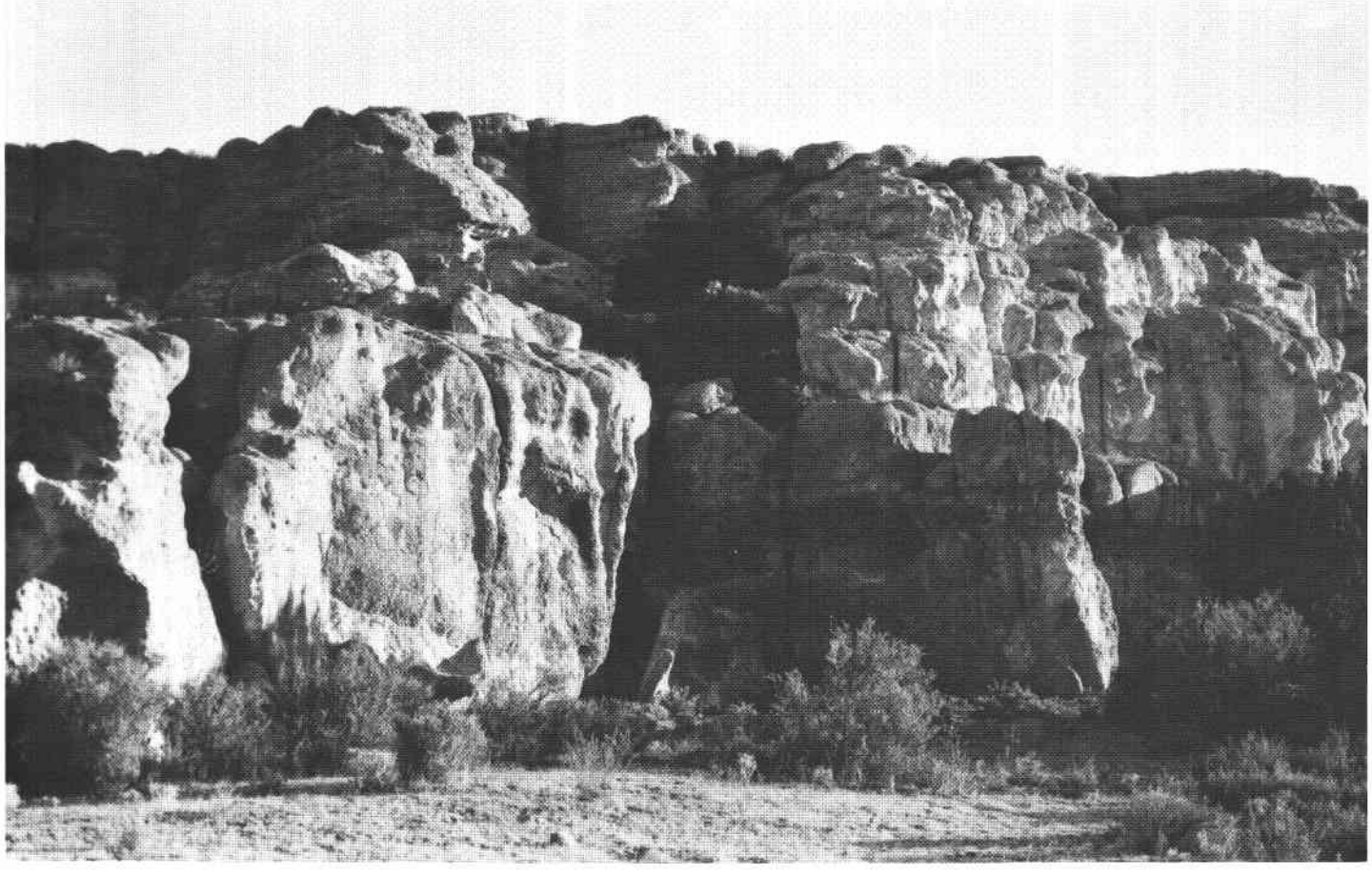

FIGURE 1.

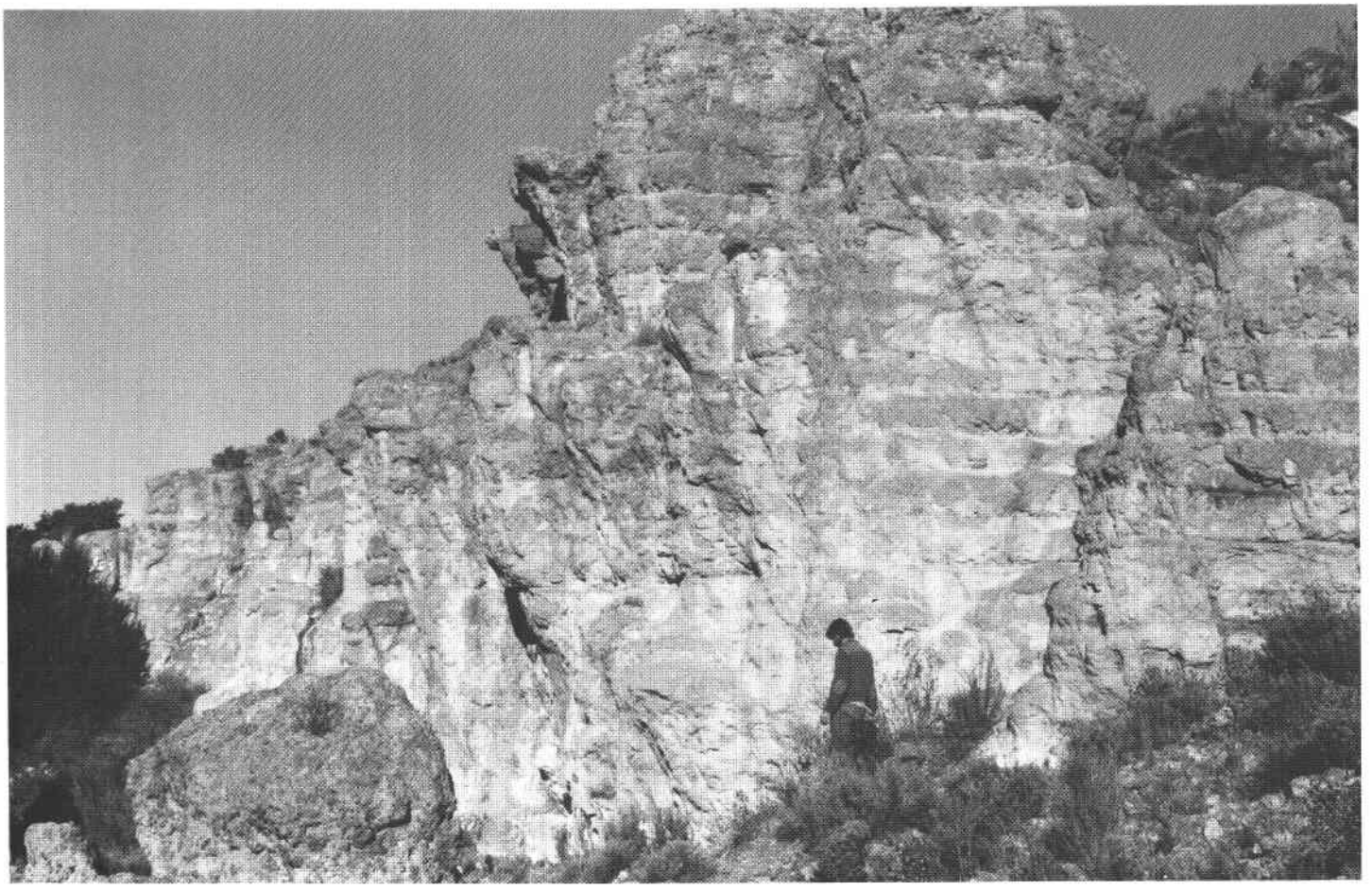

FIGURE 2.

practiced eye, these same outcrops yield much information about the volcanic events that formed them. Several layers are visible in the tuff sequence in Fig. 1. In other nearby outcrops, weathering has revealed that the sequence consists of a number of roughly equally spaced (rhythmic?) layers (Fig. 2) suggestive of bedded ash-fall deposits. Close examination reveals that things are not as they seem from a distance. Few if any of the beds are ash-fall deposits, but rather, they are ash-flow tuffs—unsorted deposits of ash, pumice, and rock fragments that were laid down by hot ground-hugging, gas-charged slurries. Fisher and Schmincke (1984) provide excellent descriptions of pyroclastic deposits and the processes that form them.

At Point of Rocks, the originally glassy pumice and ash have been diagenetically altered, and their boundaries are obscure. Thus the particle-size distribution cannot be observed clearly, and the nature of the recessively weathering zones cannot be determined conclusively. They probably represent basal layers of the ash-flow depositional units that are commonly finer grained and contain proportionally more ash and less pumice and rock fragments than the upper parts. This stack of ash-flow tuffs records episodic, violent (gas-charged) eruptions related to the emplacement of a rhyolite dome complex centered just south of this area. Pyroclastic deposits related to rhyolite domes often form ring-shaped deposits surrounding the eruptive center and consist of variable proportions of ash-fall, surge, and ash-flow beds. In deposits around this dome complex, the beds are mostly ash-flow tuffs. Erosion, faulting, and tilting have obscured the radial distribution relationship here, if it ever existed. A similar, but fresher, sequence of thin ash-flow tuffs that preserves original textures is present in Scales Canyon in the central Black Range. This exposure, which has been described by Kyle et al. (1986), is related to the Taylor Creek Rhyolite, which also hosts tin occurrences.

The tuffs and parent rhyolite domes at Point of Rocks Canyon are closely bracketed in time between the 28.8 m.y. old La Jencia Tuff and 28.5 m.y. old Vicks Peak Tuff (dates from McIntosh et al., 1986). Rhyolitic lavas of this age are fairly common in the northeastern Mogollon–Datil volcanic field and perhaps record an early magmatic response to the beginning of extension along the Rio Grande rift, estimated to have begun between 32 and 27 m.y. ago (Chapin, 1979).

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