

# Oligocene eolianites and ichnofossils in the central San Mateo Mountains

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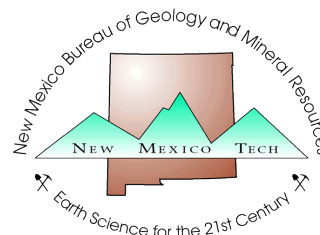
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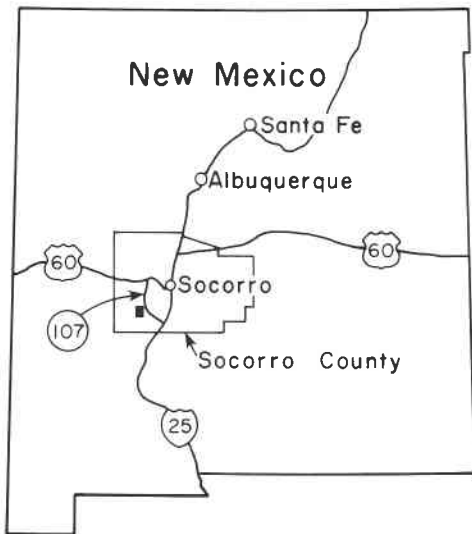
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The prominent saddle in the central San Mateo Mountains, Socorro County, New Mexico, is caused by a downfaulted block of easily eroded volcanoclastic sedimentary rocks called the unit of East Red Canyon (Ferguson, 1985). These rocks are interpreted to be moat-fill of a late Oligocene ash-flow-tuff cauldron in the northern San Mateo Mountains. The cauldron, which was the source of the 27.4 Ma (Kedzie et al., 1985) South Canyon Tuff, is currently known to be smaller and younger than what was originally described as the Mt. Withington cauldron by Deal (1973). The southeast topographic margin of this cauldron was the major source region for a west-fining alluvial-fan complex in the East Red Canyon area. Adjacent to the topographic margin, the sedimentary sequence consists mostly of coarse clast-supported debris-flow deposits and fluvial conglomerates. To the west (towards the middle of the cauldron) the sequence is dominated by medium-grained cross-stratified sandstone, which is interpreted to be eolian (Fig. 1). The sandstone was deposited by prevailing southwest winds in tabular-planar to wedge-planar sets up to 20 ft thick (Ferguson, 1985). At least 600 ft of these rocks are exposed along the walls of East Red Canyon, the principle drainage for the east slope of the central San Mateo Mountains.

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FIGURE 1—An exposure of eolian sandstone, looking northwest, on the north wall of East Red Canyon just below The Park (sec. 26, T6S R6W, unsurveyed). Six-foot-tall Gunars Berzins is at the base of the cliff for scale.

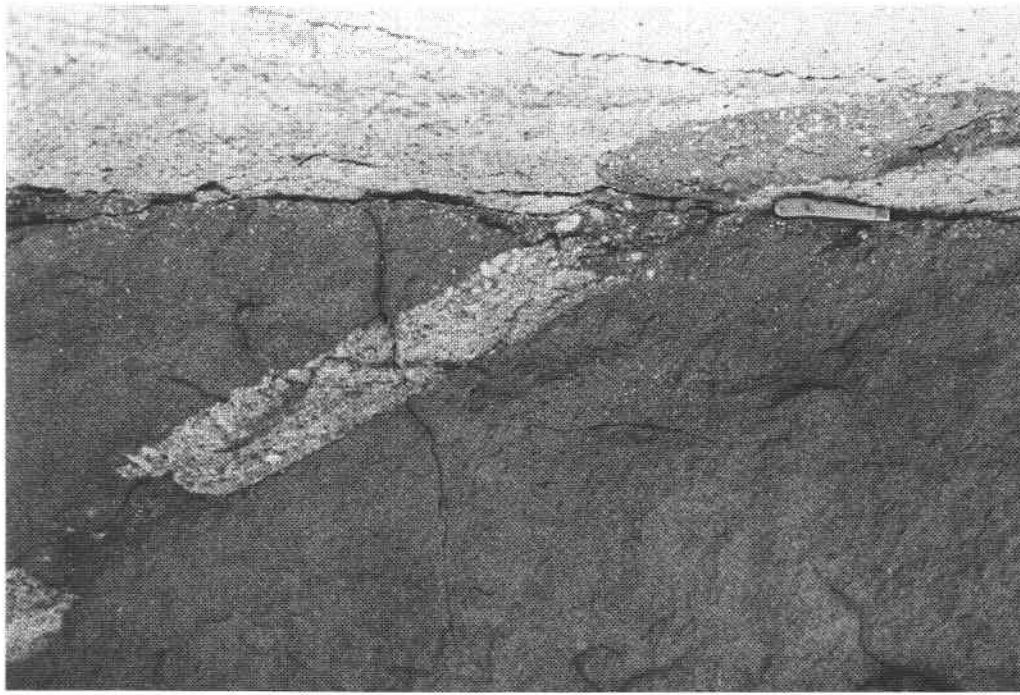


FIGURE 2—An inclined burrow from the upper part of the unit of East Red Canyon in Allen Spring Canyon (sec. 35, T6S, R6W, unsurveyed). The 3-inch-wide burrow extends from the top of an eolian sandstone set through an overlying 2-ft-thick bed of air-fall tuff. Overlying the ash layer (not shown in the photograph) is a bed of massive sandstone. The burrow is filled with ash within the lower sandstone, but in the ash layer above, it is filled with sand. If the burrow was occupied during deposition of the air-fall tuff, it is logical that the animal(s) would try to escape. In route to the surface the burrowing animal would have pushed stopped ash to the bottom of its burrow. Eventually the upper part of the burrow filled with sand from above.

The upper part of the unit of East Red Canyon contains thin sets of bedded air-fall tuff interlayered with sandstone, which preserve two ichnofossils found in Allen Spring Canyon, a tributary to East Red Canyon. One of the fossils is an inclined burrow with an interesting burial and escape history (Fig. 2). The other fossil is a pair of footprint molds in a slab of thinly bedded air-fall tuff (Fig. 3). The animal responsible for the prints has not been identified positively, but the tracks are similar to those described by Lucas (1983) in the Baca Formation (Eocene) in the Bear Mountains, about 45 mi to the north. The footprints are on display in the Mineral Museum at the New Mexico Bureau of Mines and Mineral Resources in Socorro. The inclined burrow and excellent exposures of eolian sandstone are within 0.5 mi walking distance from Turkey Spring, which is at the end of Cibola National Forest road 331.

A more detailed description of the unit of East Red Canyon and the geology of the central San Mateo Mountains is available from New Mexico Institute of Mining and Technology (Ferguson, 1985). The report will soon be available, in revised form, as a New Mexico Bureau of Mines and Mineral Resources Open-file Report.

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FIGURE 3—Arctiodactyl (split-hooved mammal) footprint molds in a slab of bedded air-fall tuff from the upper part of the unit of East Red Canyon. The two round shapes at the bottom of the photograph are probably fecal pellet imprints. The pocket knife is 4 inches long.