PRIMITIVE MAMMOTH JAW FROM LOWER PLEISTOCENE RIO GRANDE SEDIMENTS, SOCORRO, NEW MEXICO

Spencer G. Lucas[1], Gary Morgan[1], Craig Bejnar[2], Nelia Dunbar[3], Richard Chamberlin[3] and David Love[3]

[1] New Mexico Museum of Natural History, 1801 Mountain Road N.W., Albuquerque, NM, 87104, spencer.lucas@state.nm.us

[2] Socorro, NM, 87801

[3] New Mexico Bureau of Geology and Mineral Resources, New Mexico Institute of Mining and Technology, Socorro, NM, 87801

A mammoth jaw found as a large clast reworked from ancestral Rio Grande (ARG) deposits in Matanza Arroyo at Socorro, New Mexico, is from one of the geologically oldest and most primitive North American mammoths. Thin, cross-bedded layers of pumice above the jaw-bearing bed are geochemically identical to Group II pumices in ARG sediments between 1.2 and 1.6 million years in age (Cerro Toledo eruptions of Jemez volcanic field) studied in Hell Canyon. The ARG deposits underlie thick fan deposits of Qvo3, which forms the surface at the Socorro County fairgrounds and airport. This fan surface is traceable down the arroyo to ancestral Rio Grande terrace deposits, 30 m above the modern Rio Grande floodplain and is traceable up Matanza Arroyo to a terrace along Socorro Canyon Arroyo. In 2003, Phillips et al. determined a ^{36}Cl age of 122 ± 18 ka for this terrace. Although the upper surface and shallow deposits of Qvo3 likely are equivalent to the age of the Qvo3 terrace in Socorro Canyon, the stratigraphy of the alluvium and soils between the jaw and the fan surface suggests a long history of erosion, deposition, and stability.

The mammoth fossil, catalogued as New Mexico Museum of Natural History P-67371, is a left dentary fragment with incomplete m2-3. It has a short symphysis, relatively low and narrow horizontal ramus and, what remains of the ascending ramus suggests it was relatively low and inclined posteriorly. The left m2 is fully erupted, moderately worn and preserves 6.5 plates (the anterior 1-2 plates are missing), for a plate count of 7-8. The tooth is relatively small (length = 150 mm, width = 70 mm), has a low plate ratio of 6 and very thick enamel (average thickness = 3.8 mm). The m3 is beginning to erupt and preserves 6.5 similar plates with very thick enamel. The small size of the molars, very thick enamel and shape of the dentary identify NMMNH P-67371 as a very primitive mammoth, *Mammuthus meridionalis*.

Three other early Pleistocene (early Irvingtonian North American land-mammal "age," ~1.6-1.0 Ma) mammoths are found in New Mexico. The most complete specimen is a pair of lower jaws from the Sierra Ladrones Formation in Tijeras Arroyo, Bernalillo County. The Tijeras Arroyo mammoth was referred to *Mammuthus meridionalis* based on the low plate count and thick enamel of the m3 and shape of the dentary, all similar to the Matanza Arroyo mammoth. A partial skull with both tusks and an M3 of *M. meridionalis* were collected from the Adobe Ranch fauna in the Camp Rice Formation, Doña Ana County. Both the Tijeras Arroyo and Adobe Ranch records of *M. meridionalis* are associated with Ar/Ar dated volcanic ashes, indicating an age range of 1.6–1.2 Ma. Several isolated teeth of the more advanced mammoth *M. imperator* are known from the Tortugas Mountain fauna east of Las Cruces in the Camp Rice Formation, Doña Ana County. The association of the Tortugas Mountain *Mammuthus* with the gomphothere *Stegomastodon* suggests an age older than 1.2 Ma.