



## *Miocene proboscidean from the Fence Lake Formation, Catron County, New Mexico*

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# MIOCENE PROBOSCIDEAN FROM THE FENCE LAKE FORMATION, CATRON COUNTY, NEW MEXICO

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**Abstract**—An incomplete left innominate of a proboscidean was collected from the lower Fence Lake Formation southwest of Quemado in Catron County. This fossil establishes a maximum age for the base of the Fence Lake Formation of 14.5 Ma (beginning of late Barstovian).

## INTRODUCTION

McLellan et al. (1982) named the Fence Lake Formation for exposures 3 mi (4.8 km) south of Fence Lake, New Mexico (Fig. 1). They postulated a Miocene age for the unit based on nothing more than prevailing thought and the observation that the source area was the "Oligocene volcanics of the Datil Mountain region." While this was an acceptable age assignment, it did leave open to question the exact age of the basal Fence Lake Formation.

We report here a fossil mammal bone from the lower part of the Fence Lake Formation southwest of Quemado in Catron County (Fig. 1). The junior author and his assistant, Glen E. Jones, discovered this fossil during reconnaissance work in 1992 and it was subsequently collected by Adrian Hunt, Peter Reser and the senior author. The fossil locality is NMMNH (New Mexico Museum of Natural History and Science) locality 2808 located at UTM 3779380N, 716820E, zone 12 (NE¼, sec. 18, T2S, R17W; Ponderosa Tank U.S.G.S. 7.5-minute quadrangle). The fossil bone, NMMNH P-22299, was in a block of grayish brown sandstone of the Fence Lake Formation approximately 1 ft (0.3 m) above its unconformable contact with the underlying Spears Formation (Fig. 2A).

## DESCRIPTION AND DISCUSSION

NMMNH P-22299 (Fig. 2B-C) is an incomplete left innominate preserving the acetabulum and the acetabular roots of the ilium, ischium and pubis. The posterior portion of the acetabulum together with the acetabular root of the ischium have been fractured and displaced anteriorly, so as to greatly distort the shape of the preserved portion of the obturator foramen so it is more rectangular than ovoid. The acetabulum is shallow, eroded in the area of the acetabular fossa and has a maximum diameter of 115 mm. The pubic border of the acetabulum has a low blunt ridge that runs dorso-ventrally.

The very large size and morphology of NMMNH P-22299 indicate it belongs to a proboscidean. Its relatively small size, shallow acetabulum, poorly formed acetabular fossa and/or lack of a pronounced tuberosity on the pubic border of the acetabulum preclude assignment of NMMNH P-22299 to either *Mammuthus*, the mammoth, or *Mammut*, the American Mastodon (cf., Olsen, 1979, figs. 24-28). Instead, these features suggest assignment to an older, more primitive proboscidean, a gomphothere (Osborn, 1936). Full fusion of all pelvic bones suggests that NMMNH P-22299 is an adult individual, so it is not a juvenile of one of the larger, post-Miocene proboscideans.

The oldest record of proboscideans in North America is the time of their immigration from Eurasia at the beginning of the late Barstovian, about 14.5 Ma (Tedford et al., 1987). NMMNH P-22299 thus indicates the Fence Lake Formation outcrop from which it was collected is no older than 14.5 Ma. The minimum age for the Fence Lake Formation of 6.9 Ma established by the basalt flow at Tejana Mesa is not contradicted by the gomphothere fossil reported here. Indeed, this fossil cannot be any younger than late Miocene or Pliocene. It thus seems that the gomphothere fossil reported here, besides being the first fossil described from the Fence Lake Formation, refines estimates of the initiation of Fence Lake deposition to no older than middle Miocene, 14.5 Ma.

## ACKNOWLEDGMENTS

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## REFERENCES

- Dethier, D. P., Aldrich, M. J., Jr. and Shafiqullah, M., 1986, New K-Ar ages for Miocene volcanic rocks from the northeastern Jemez Mountains and Tejana Mesa, New Mexico: *Isochron/West*, no. 47, p. 12-14.
- McLellan, M., Robinson, L., Haschke, L., Carter, M. D. and Medlen, A., 1982, Fence Lake Formation (Tertiary), west-central New Mexico: *New Mexico Geology*, v. 4, p. 53-55.
- Olsen, S. J., 1979, *Osteology for the archaeologist*. No. 3. The American mastodon and the woolly mammoth: Papers of the Peabody Museum of Archaeology and Ethnology, Harvard University, v. 56, no. 3, 47 p.
- Osborn, H. F., 1936, *Proboscidea* Vol. I: Moeritherioidea, Deinotherioidea and Mastodontoidea: New York, American Museum of Natural History, 802 p.
- Tedford, R. H., Skinner, M. F., Fields, R. W., Rensberger, J. M., Whistler, D. P., Galusha, T., Taylor, B. E., Macdonald, J. R. and Webb, S. D., 1987, Faunal succession and biochronology of the Arikareean through Hemphillian interval (late Oligocene through earliest Pliocene epochs) in North America; in Woodburne, M. O., ed., *Cenozoic mammals of North America geochronology and biostratigraphy*: Berkeley, University of California Press, p. 153-210.

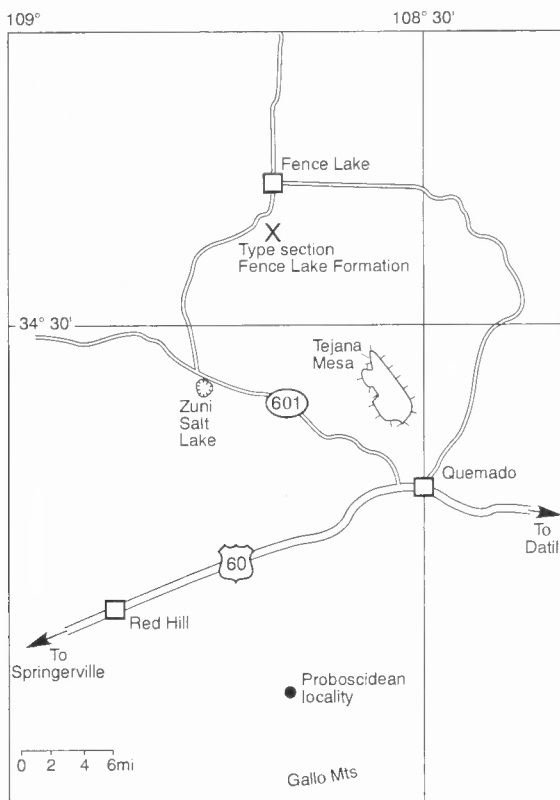


FIGURE 1. Index map of Quemado-Fence Lake area showing proboscidean locality, and location of type section of Fence Lake Formation.

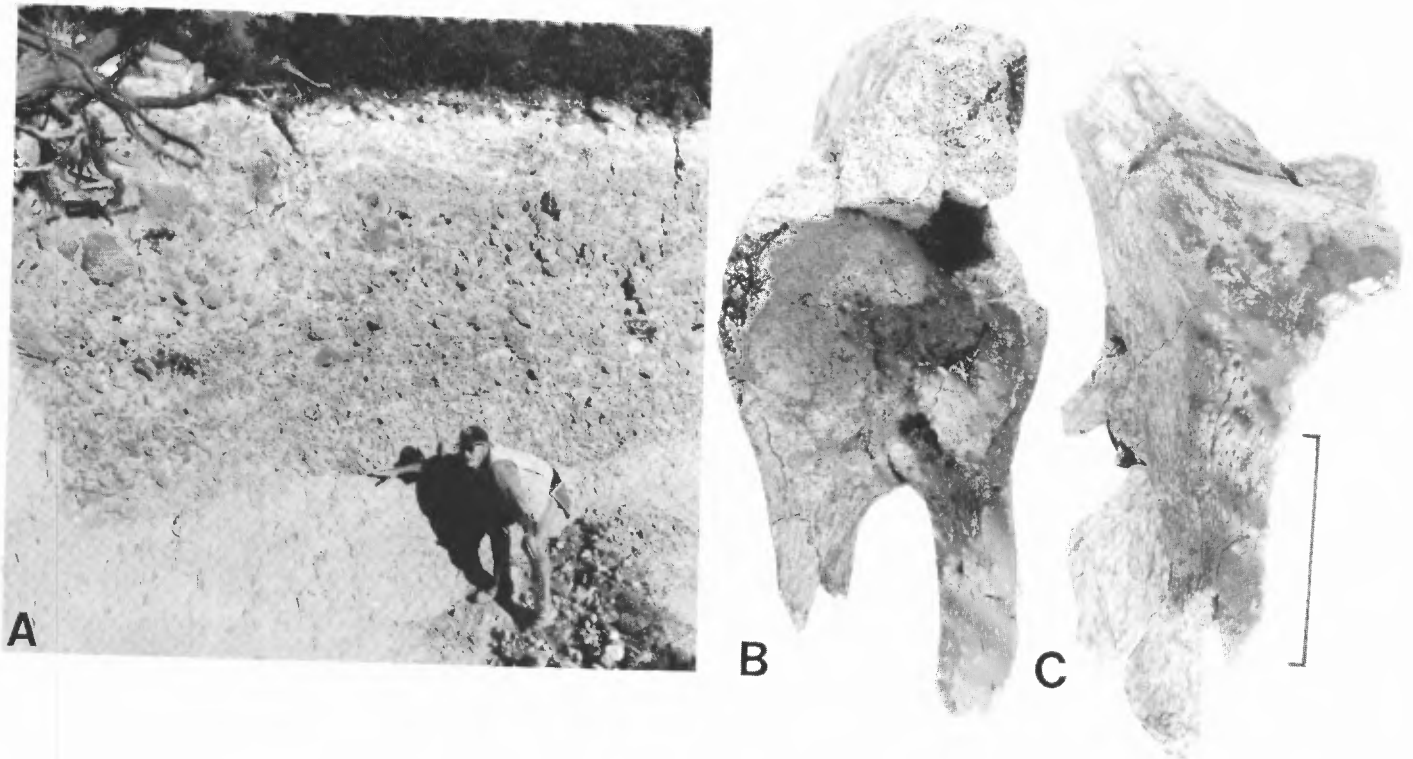


FIGURE 2. A, Fence Lake Formation boulder conglomerate overlying Spears Formation (Man's hand marks contact) at NMMNH locality 2808. B-C, NMMNH P-22299, incomplete left innominate of a gomphothere, ventral (B) and dorsal (C) views. Bar scale = 10 cm.