



Fossil evidence of Eocene age of Baca Formation, New Mexico

Donald O. Snyder

1970, pp. 65-68. <https://doi.org/10.56577/FFC-21.65>

in:

Tyrone, Big Hatchet Mountain, Florida Mountains Region, Woodward, L. A.; [ed.], New Mexico Geological Society 21st Annual Fall Field Conference Guidebook, 176 p. <https://doi.org/10.56577/FFC-21>

This is one of many related papers that were included in the 1970 NMGS Fall Field Conference Guidebook.

Annual NMGS Fall Field Conference Guidebooks

Every fall since 1950, the New Mexico Geological Society (NMGS) has held an annual [Fall Field Conference](#) that explores some region of New Mexico (or surrounding states). Always well attended, these conferences provide a guidebook to participants. Besides detailed road logs, the guidebooks contain many well written, edited, and peer-reviewed geoscience papers. These books have set the national standard for geologic guidebooks and are an essential geologic reference for anyone working in or around New Mexico.

Free Downloads

NMGS has decided to make peer-reviewed papers from our Fall Field Conference guidebooks available for free download. This is in keeping with our mission of promoting interest, research, and cooperation regarding geology in New Mexico. However, guidebook sales represent a significant proportion of our operating budget. Therefore, only *research papers* are available for download. *Road logs*, *mini-papers*, and other selected content are available only in print for recent guidebooks.

Copyright Information

Publications of the New Mexico Geological Society, printed and electronic, are protected by the copyright laws of the United States. No material from the NMGS website, or printed and electronic publications, may be reprinted or redistributed without NMGS permission. Contact us for permission to reprint portions of any of our publications.

One printed copy of any materials from the NMGS website or our print and electronic publications may be made for individual use without our permission. Teachers and students may make unlimited copies for educational use. Any other use of these materials requires explicit permission.

This page is intentionally left blank to maintain order of facing pages.

FOSSIL EVIDENCE OF EOCENE AGE OF BACA FORMATION, NEW MEXICO

By

DON O. SNYDER

The University of New Mexico

INTRODUCTION

The Eocene Baca Formation crops out in laterally discontinuous exposures along a belt aligned east-west in central Socorro and Catron Counties, New Mexico (Fig. 1).

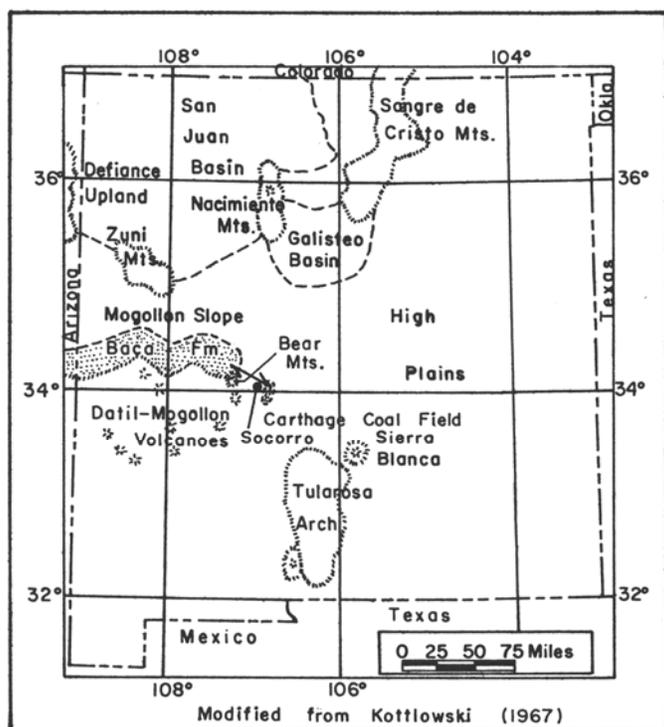


FIGURE 1.

Schematic map of New Mexico showing the general outcrop extent of the Baca Formation.

This belt is approximately 120 miles long and 20 miles wide. The formation consists of a suite of terrestrial sediments composed of conglomerate, sandstone, siltstone, and mudstone averaging 700 feet in thickness. Maximum reported thickness is about 2,500 feet in a wildcat oil test drilled by Tenneco 8 miles south of Pietown.

Until recently, no fossil evidence has been found on the west side of the Rio Grande to substantiate an Eocene age which Gidley (Gardner, 1910) postulated for the Baca Formation on the east side of the Rio Grande in the vicinity of the Carthage coal field. The Eocene age assigned to the Baca in the Carthage area is based on a fossil mammalian tooth. Discovery and identification of additional mammal teeth approximately 15 miles north of Datil (Fig. 2) confirm that the Baca Formation west of the Rio Grande is

also of Eocene age.

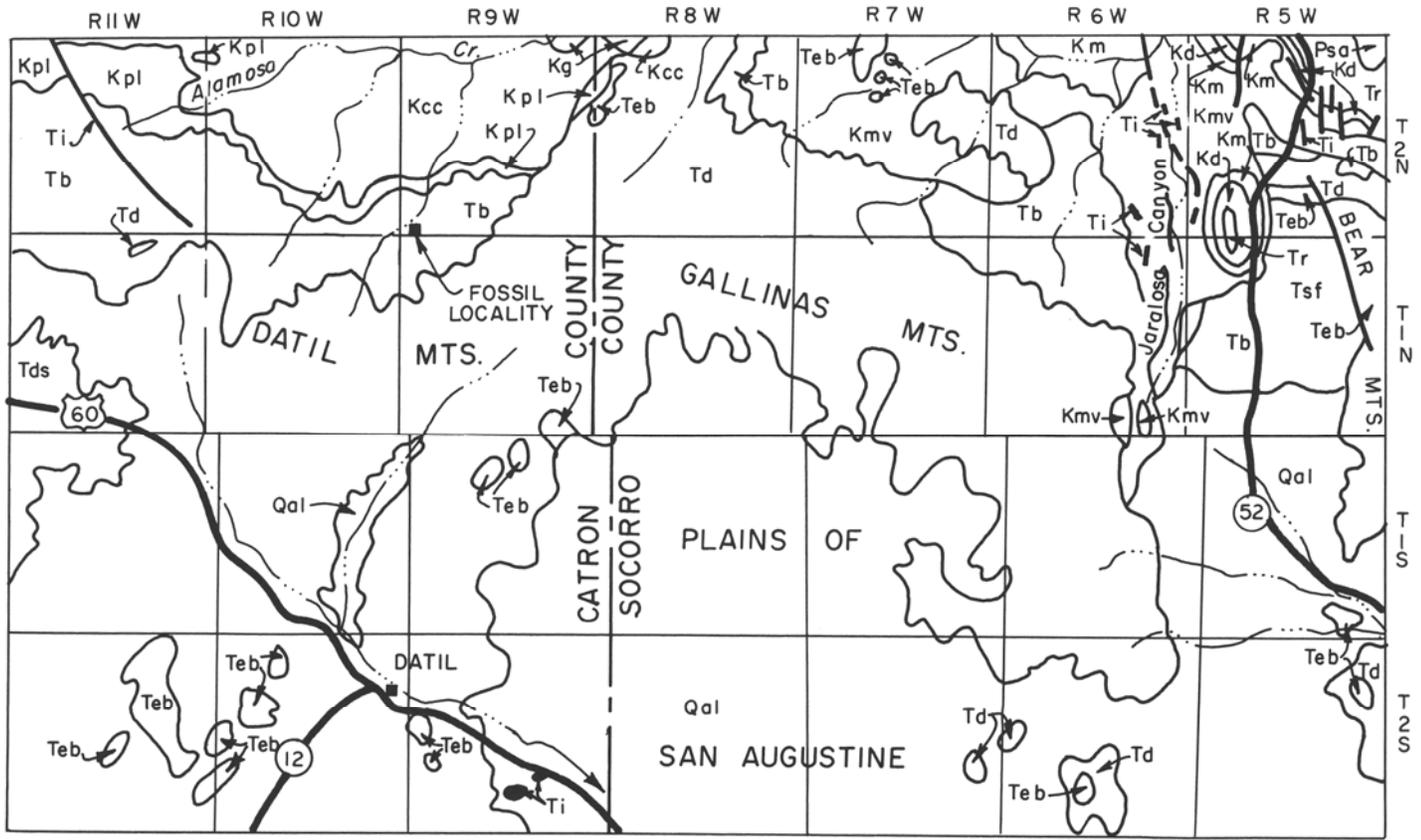
HISTORICAL BACKGROUND

During a reconnaissance geologic survey of the Carthage coal field, southeast of Socorro, Gardner (1910) discovered a fossil mammal tooth which was later identified by J. W. Gidley as *Palaeosyops*, a rhinoceras-type animal about the size of a tapir but without the typical nosehorn. Gidley concluded that the redbeds and conglomeratic sandstone containing *Palaeosyops* are Bridger (middle Eocene) in age.

Ten years later approximately 2000 feet of volcanic tuff, rhyolite, sandstone, and conglomerate at the north end of the Bear Mountains were described and named the Datil Formation by Winchester (1920). Wilpolt and others (1946) proposed the name Baca Formation for a locality in Baca Canyon; secs. 4, 5, 8, and 9, '1. 1 N., R. 4 W., Socorro County, for the lower 684 feet of Winchester's Datil Formation. Willard (1959) interestingly pointed out "365 of the 684 feet of the "section" at the measured section were named for a canyon outside the area covered by Winchester's map. . . . and the description given by Wilpolt was not of the material at the type locality, nor in Winchester's measured section, but of material mapped by Wilpolt in the Joyita Hills-Carthage area." Wilpolt and others (1946) correlated the sediments of the Carthage area with those in Baca Canyon and concluded on the basis of lithologic similarity and stratigraphic position that the Baca Formation could be extended to the Carthage area. Potter (1970) separated the Baca Formation, in the area of Baca Canyon, into three informal subunits, described the section, and recorded the thickness as 695 feet.

ADDITIONAL FOSSIL DISCOVERY

Personnel of Gulf Oil Corporation found 15 fragments of fossilized vertebrate remains in SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 31, T. 2 N., R. 9 W. (Fig. 2). These remains were generously donated to the writer, who, in turn submitted them to the U.S. National Museum for identification. Included in the fossil fragments was a partial section of a lower (?) jaw bone containing three, and part of a fourth, well preserved molar teeth (Fig. 3). Dr. C. L. Gazin of the U.S. National Museum identified the teeth as cf. *Protoreodon pumilus* of late Eocene age. This animal is the ancestor of the modern-day sheep. Dr. Gazin noted that the other 14 fragments



MODIFIED FROM DANE AND BACHMAN (1957)

FIGURE 2.

Geologic map of parts of Catron and Socorro Counties showing the fossil locality. Discovery of mammal remains at this site are the first reported fossils from the Baca Formation west of the Rio Grande.

were indeterminate; several of the specimens are probably pieces or sections of rib bones (Fig. 4) (Northrop, 1970, personal commun.)

These specimens were found 123 feet stratigraphically above the base of the Baca Formation protruding from loose sandy material covering scattered outcrops of grayish-pink siltstone, red mudstone, and gray, poorly-sorted, coarse-grained sandstone. The question arises as to whether or not the fossils were in place or had been reworked from somewhere higher in the section. There is no direct line of evidence to cite for either condition. The fossil locality is at the north end of a linear north-trending ridge which is about 600 feet topographically lower than the southern end; however, the loose sandy cover material is a residuum of weathered Baca and if the specimens were redeposited it is almost certain that the source area may have been somewhere higher in the Baca Formation.

REFERENCES

Dane, C. H., and Bachman, G. O., 1965, Geologic map of New Mexico; U.S. Geol. Survey.
 Gardner, J. H., 1910, The Carthage coal field, New Mexico: U.S. Geol. Survey Bull. 381, p. 454.
 Kottowski, F. E., 1967, Mosaic of New Mexico's scenery, rocks, and history in Scenic trips to the geologic past no. 8: N. Mex. Bureau Mines and Min. Res. p. 35.

EXPLANATION

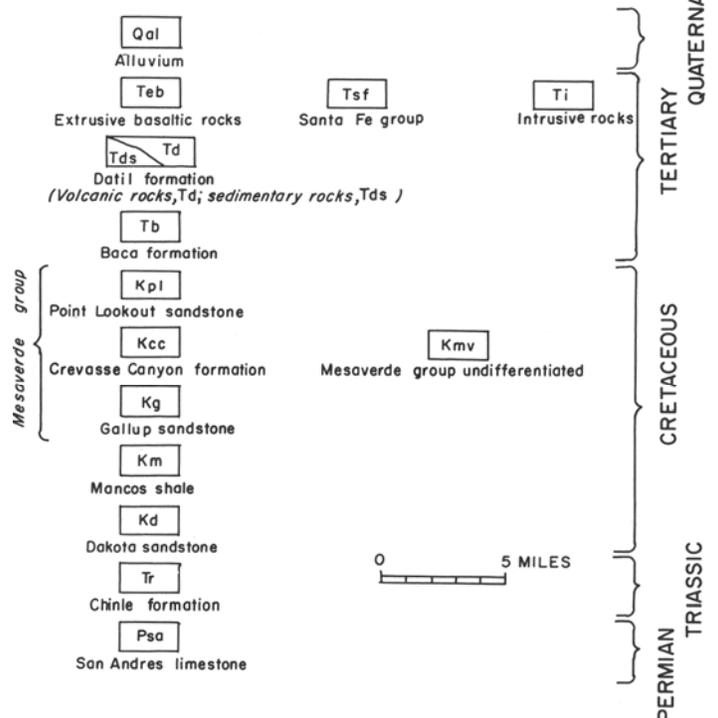




FIGURE 3.

Photograph showing 3, and a part of the fourth well preserved teeth of cf. *Protoreodon pumilus*. This animal is the ancestor to the modern-day sheep. Dimensions are 1.5 inches long and .5 inches wide.

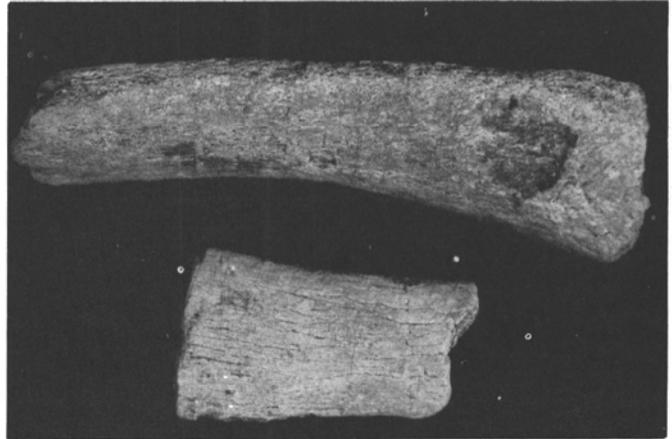


FIGURE 4.

Photograph of two rib bones (?) found a few feet from the jaw-bone and teeth shown in Fig. 3. Dimensions of the larger bone are 1 inch wide and 3.5 inches long; and the smaller bone 1 inch wide and 1.5 inches long.

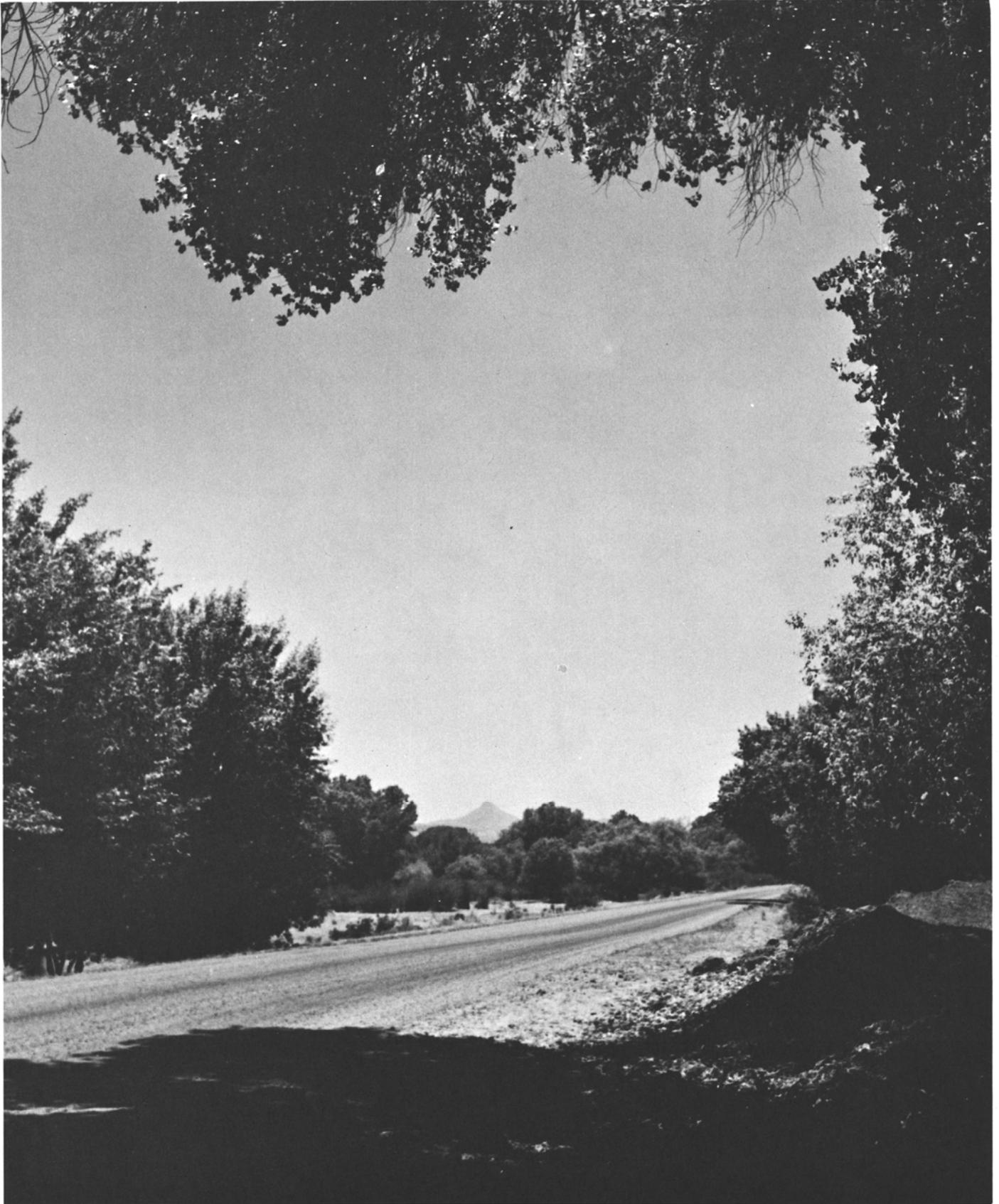
Potter, S. C., in preparation, Geology of Baca Canyon, Socorro County, New Mexico; Unpublished Masters Thesis, University of Arizona, 41 p.

Willard, M. E., 1959, Tertiary stratigraphy of northern Catron County, New Mexico: N. Mex. Geol. Soc. Guidebook, Tenth Annual Field Conference, West-Central New Mexico, p. 92-99.

Wilpolt, R. H., MacAlpin, A. J., Bates, R. L., and Vorbe, Georges,

1946, Geologic map and stratigraphic sections of Paleozoic rocks of Joyita Hills, Los Pinos Mountains, and northern Chupadera Mesa, Valencia, Torrance, and Socorro Counties, New Mexico: U.S. Geol. Survey Oil and Gas Inv. Map 61.

Winchester, D. E., 1920, Geology of Alamosa Creek Valley, Socorro County, N. Mex., with special reference to the occurrence of oil and gas: U.S. Geol. Survey Bull. 716 A.



State Highway 61 along Mimbres Valley. Cooks Peak in background.