Oligocene mammals from the Black Range, southwestern New Mexico

Spencer G. Lucas, 1986, pp. 261-263

in:

Truth or Consequences Region, Clemons, R. E.; King, W. E.; Mack, G. H.; Zidek, J.; [eds.], New Mexico Geological Society 37th Annual Fall Field Conference Guidebook, 317 p.

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

OLIGOCENE MAMMALS FROM THE BLACK RANGE, SOUTHWESTERN NEW MEXICO

SPENCER G. LUCAS
Department of Geology, University of New Mexico, Albuquerque, NM 87131

Abstract—Fossil mammals from the upper part of the Rubio Peak Formation in the northern Black Range, Sierra County, New Mexico, are: *Jaywilsonomys ojinagaensis* Ferrusquia-Villafranca & Wood 1969, Perissodactyla gen. et sp. indet., Hypertragulidae?, and *Montanatylopsus matthewi* Prothero 1986. These mammals indicate an early Chadronian age (earliest Oligocene, about 36 Ma) and thus are the first Oligocene mammals recorded from New Mexico.

INTRODUCTION

Oligocene landscapes of New Mexico were dominated by andesite stratovolcanoes and resurgent domes of ash-flow-tuff (ignimbrite) cauldrons (Smith et al. 1985). This pervasive volcanism produced volcanic and volcaniclastic rocks that have been neglected by vertebrate paleontologists so that until recently no Oligocene vertebrate fossils were discovered in New Mexico. Here I present the preliminary result of paleontological investigations of Oligocene rocks in New Mexico, a small collection of Oligocene mammals from the northern Black Range of Sierra County. In this paper, UNM refers to the Department of Geology, University of New Mexico.

PROVENANCE

The Oligocene mammals described here were collected in the northern Black Range on the north flank of Turkey Creek northwest of Winston, New Mexico (Fig. 1). These mammals are from two localities: (1) UNM locality 202 in the SW¼SE¼ sec. 24, T10S, R9W; and (2) UNM locality 203 in the SW¼SW¼ sec. 14, T10S, R9W (Fig. 2).

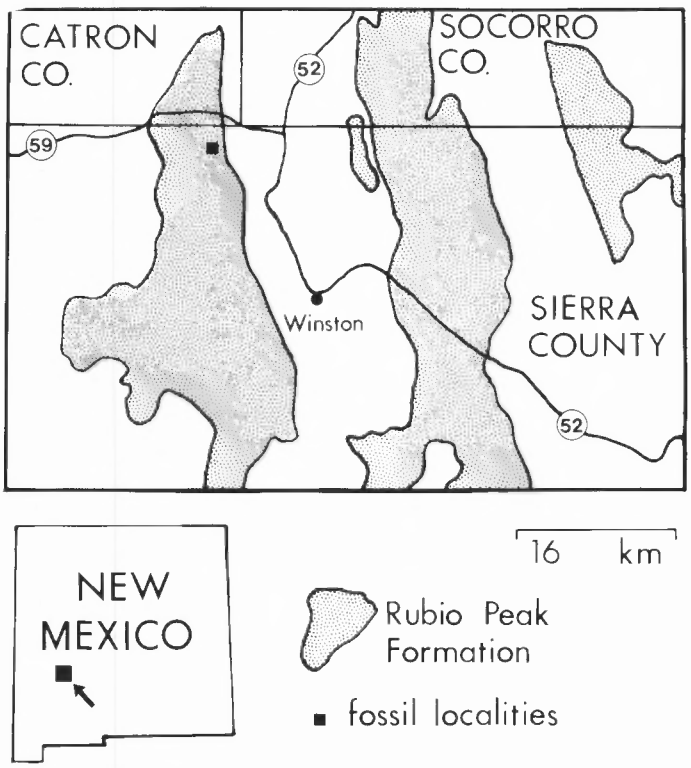

FIGURE 1—Map of part of southwestern New Mexico showing distribution of Rubio Peak Formation (after New Mexico Geological Society 1982) and location in northern Black Range where Oligocene mammals were collected from Rubio Peak Formation.

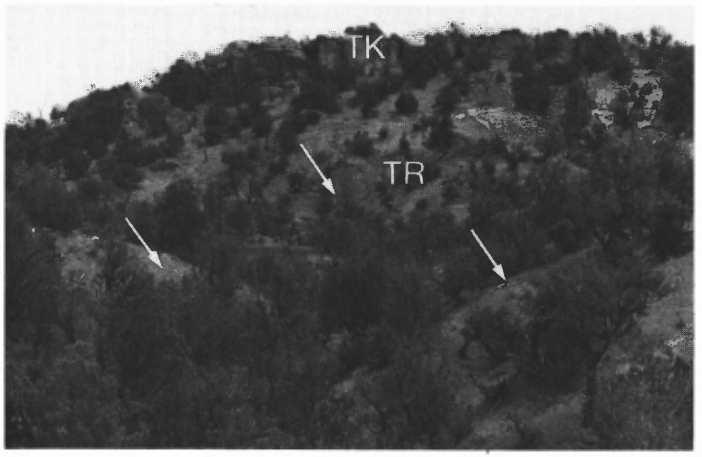

FIGURE 2—View of UNM locality 203 (white arrows) in upper part of Rubio Peak Formation (TR) and overlying Kneeling Nun Tuff (TK).

These localities are in a sequence of grayish-blue andesitic siltstone of the Rubio Peak Formation of Jicha (1954) and Elston (1957), which has recently been mapped in the northern Black Range by Hedlund (1977), Woodard (1982), and R. Harrison (written comm. 1986). It was previously identified in this area as "early andesite volcanic sequence" by Erickson et al. (1970), "Spears(?) Formation" by Coney (1976), and "andesite" by Fodor (1976) and Maxwell & Heyl (1976). The fossil-bearing rocks along Turkey Creek pertain to the dominantly fine-grained volcaniclastic portion of the upper Rubio Peak Formation and are overlain by moderately welded ash-flow tuffs of the Kneeling Nun Tuff (Fig. 2; R. Harrison written comm. 1986).

VERTEBRATE PALEONTOLOGY

JAYWILSONOMYS OJINAGAENSIS Ferrusquia-Villafranca & Wood 1969

UNM RP-007 (Fig. 3A–C) from UNM locality 203 is a left-dentary fragment of a rodent that bears nearly complete M_2, complete M_3, and part of the lower incisor (visible on the ventral aspect of the dentary beneath M_2: Fig. 3B). The relatively high crowns of the cheek teeth, their basic four-lophid pattern, and lack of mesolophids identify UNM RP-007 as a cylindrodontid. Assignment to the Jaywilsonomyinae of Wood (1974) is supported by the fact that the M_{2-3} protoconids and metaconids are only connected by way of the anterolophids, so that the trigonid basins drain anteriorly. The strong marginal anterolophids, virtual lack of metalophulid II's, and lingually wide openings of the molar talonid basins justify assignment of UNM RP-007 to *Jaywilsonomys* Ferrusquia-Villafranca & Wood 1969. The relatively large size of UNM RP-007 (M_2 length = 3.9+ mm, width = 3.9 mm; M_3 length = 4.1 mm, width = 3.5 mm) indicates that it pertains to the large species of *Jaywilsonomys, J. ojinagaensis* (cf. Wood 1974: tab. 11).

As Wood (1980) observed, jaywilsonomyines have a southern distribution in western North America (southern California, Chihuahua,

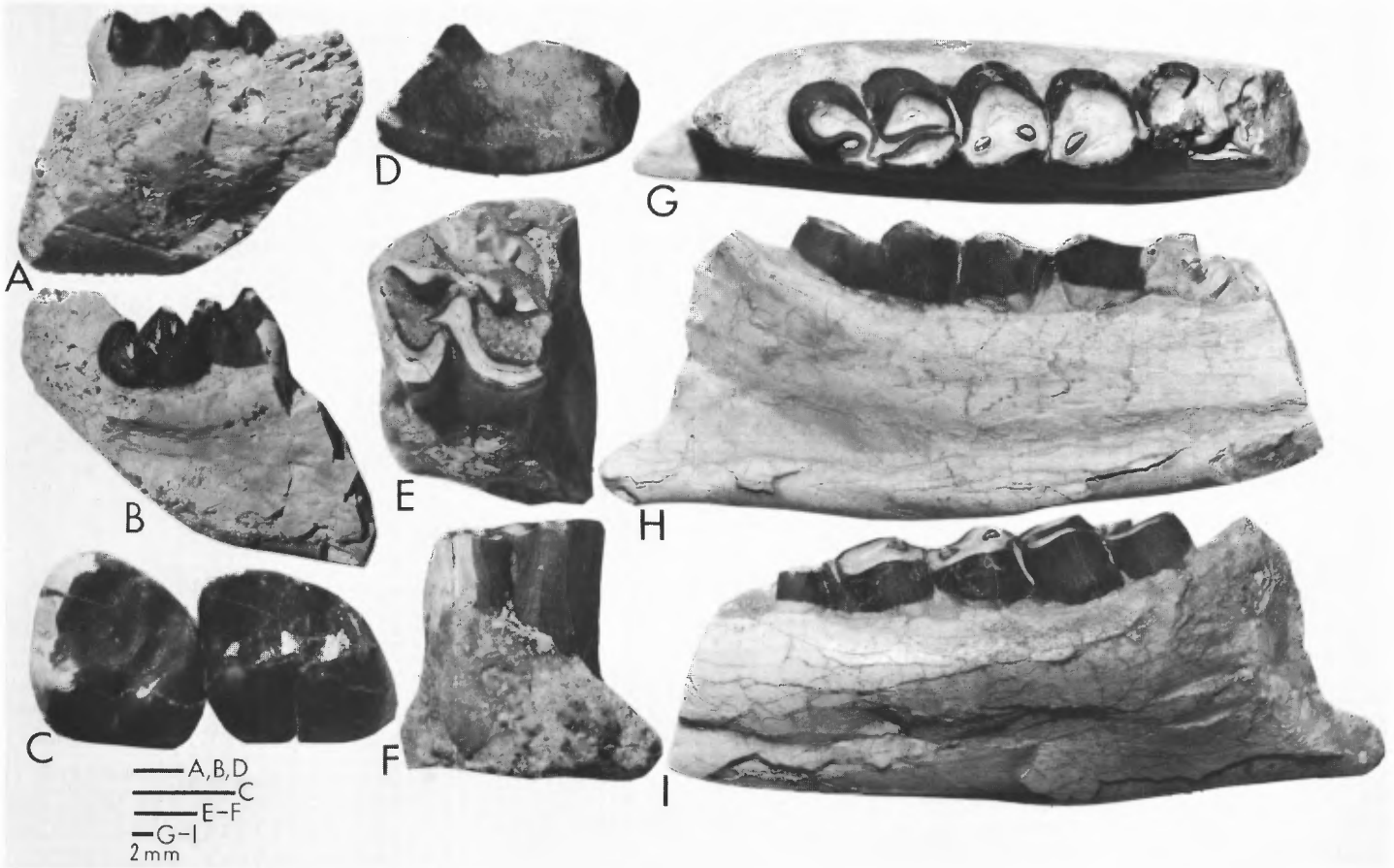

FIGURE 3—Oligocene mammals from Rubio Peak Formation. **A–C,** *Jaywilsonomys ojinagaensis,* UNM RP-007, left-dentary fragment with M_{2-3}, labial (A), lingual (B), and occlusal (C) views. **D,** Perissodactyla gen. et sp. indet., UNM RP-005, occlusal view of incomplete lower molar lophid. **E, F,** Hypertragulidae?, UNM RP-006, incomplete lower molar, occlusal (E) and lingual (F) views. **G–I,** *Montanatylopus matthewi,* UNM RP-001, left-dentary fragment with incomplete M_2 and complete M_3, occlusal (G), lingual (H), and labial (I) views.

and Trans-Pecos Texas) during the late Eocene and Oligocene. The occurrence in southern New Mexico reported here is consistent with this pattern. *J. ojinagaensis* is known from the early Chadronian Rancho Gaitan local fauna of Chihuahua, and the smaller species *J. pintoensis* is also known from that local fauna and the early Chadronian Airstrip local fauna of Trans-Pecos Texas (Wood 1974). The occurrence of *J. ojinagaensis* in the Rubio Peak Formation thus supports an early Chadronian age assignment of about 36 Ma (Ferrusquia-Villafranca 1969, Wilson 1978, Prothero 1985).

Perissodactyla

UNM RP-005 (Fig. 3D) is a fragment of a lower molar lophid from UNM locality 203. Size and fine enamel crenulation suggest it belongs to a non-equoid perissodactyl. UNM RP-003 is the incomplete root of a large cheek tooth, perhaps of a brontothere. Both of these specimens are compatible with a Chadronian age assignment, although they do not necessarily support such an assignment.

Hypertragulidae?

UNM RP-006 (Fig. 3E, F) is an incomplete right lower molar of a selenodont artiodactyl from UNM locality 203. Salient features of this tooth are: (1) relatively high crown (height of preserved crown = 4.9 mm); (2) relatively small size (length = 5.5+ mm, width = 4.7+ mm); (3) no enamel plications; (4) no cuspid ("pillar") or cingulid on the lingual base of the crown between the hypoconid and protoconid; (5) metaconid and entoconid apparently connected by a single cristid; and (6) anterior cristid from hypoconid cut off from ectolophid by posterior cristid of protoconid that, nevertheless, is not connected to the metaconid posterior cristid. These features suggest that UNM RP-006 is not an agriochoerid, camelid, oromerycid, or protoceratid (cf. Gazin 1955, Wilson 1971, 1974, Golz 1976, Black 1978, Prothero 1986). Its greatest similarities are to hypertragulids (sensu Wilson 1974), but even this family-level identification should be considered tentative. Although this specimen is compatible with a Chadronian age assignment, the uncertainty of identification limits its biostratigraphic significance.

Montanatylopus matthewi Prothero 1986

UNM RP-001 (Fig. 3G–I) from UNM locality 202 is a left-dentary fragment bearing the posterior root of M_1, incomplete M_2, and complete M_3. M_{2-3} are heavily worn. Salient features of this specimen are: (1) the horizontal ramus of the mandible is tall and slender; its ventral portion has been crushed medio-laterally; (2) M_{2-3} are hypsodont and very selenodont; (3) the enamel of M_{2-3} is not plicated; (4) a distinct groove separates the metaconids and entoconids of M_2 and M_3; (5) M_2 and M_3 narrow posteriorly and are relatively large (anteroposterior length $M_2 = 17.3 \pm$ mm, $M_3 = 24.4$ mm; trigonid width $M_2 = 9.7 \pm$ mm, $M_3 = 10.2$ mm; talonid width $M_2 = 9.3$ mm); (6) the M_3 trigonid is open anteriorly but closed posteriorly; (7) a deep groove separates the M_3 hypoconulid from the entoconid; (8) the M_3 hypoconulid is slightly curled postero-lingually; and (9) two cuspids form a bifid, antero-posterior ridge posterior to the entoconid of M_3 at the antero-lingual end of the groove that separates the entoconid and hypoconulid.

Separation of the metaconid and entoconid of the lower molars is the primary basis for identifying UNM RP-001 as an oromerycid (Gazin 1955). However, UNM RP-001 is larger than any of the previously described oromerycid genera (*Merycobunodon, Malaquiferus, Proty-*

lopus, Oromeryx, and *Eotylopus*) and the shape of its M_3 hypoconulid lobe also differs from those genera (compare UNM RP-001 with illustrations and/or measurements in Gazin 1955, Golz 1976, and Black 1978). Indeed, UNM RP-001 is essentially identical to the holotype of *Montanatylopus matthewi* Prothero 1986, and is therefore assigned to that taxon.

M. matthewi is known only from the McCarty's Mountain local fauna of Madison County, southwestern Montana (Douglass 1905), which is of early Chadronian age, about 36 Ma (Prothero et al. 1982). This suggests that UNM RP-001 was derived from a horizon in the Rubio Peak Formation of early Chadronian age.

GEOCHRONOLOGICAL SIGNIFICANCE

The Rubio Peak Formation has yielded K–Ar dates that indicate it straddles the Eocene–Oligocene boundary (here placed at 36–37 Ma following Berggren et al. 1985 and Prothero 1985). These dates are: 37.3 ± 2.3 Ma (Emory Pass, Sierra County: Marvin & Cole 1978), 36.7 ± 1.4 Ma (Black Range, Sierra County: Loring & Loring 1980), and 33.4 ± 2.1 Ma (Bounds Ranch, Grant County: Marvin & Cole 1978). Although it is not yet possible to relate these radiometric dates to the stratigraphic position of the fossil mammals from the Rubio Peak Formation, these mammals suggest ages that are compatible with these dates. Thus, a lower jaw of the brontothere *Duchesneodus* sp. from Turkey Creek in the northern Black Range (exact locality uncertain) suggests a Duchesnean (latest Eocene) age for part of the Rubio Peak Formation (Lucas 1983). The vertebrate fossils described here suggest an early Chadronian (early Oligocene) age for the upper part of the Rubio Peak Formation in the same general area. This early Chadronian age of about 36 Ma for the upper part of the Rubio Peak Formation is compatible with a radiometric date of 35.2 Ma (R. Harrison written comm. 1986) from the overlying Kneeling Nun Tuff in the northern Black Range.

The most significant aspect of the Oligocene mammals from the Rubio Peak Formation described here is that they indicate the possibility of future discoveries in the Rubio Peak and other Oligocene volcaniclastic rocks of New Mexico. Many of the middle Tertiary volcanic rocks of New Mexico were secondarily altered by later volcanism and yield spurious radiometric dates (W.E. Elston oral comm. 1984). Mammalian remains can, in places, provide more precise age determinations for these rocks than radiometric dates. And, in those places where fossil mammals and reliable radiometric dates can be obtained in the same stratigraphic section, further advances can be made in relating the Oligocene mammalian biochronology of western North America to a geochronometric time scale.

ACKNOWLEDGMENTS

I am grateful to T.R. Logan, P.K. Reser, D.L. Schlack, and J. Sobus for assistance in the field. R. Harrison kindly provided me with essential information on Oligocene volcanic stratigraphy in the northern Black Range. D.R. Prothero and R.M. Schoch reviewed an earlier version of this paper.

REFERENCES

Berggren W.A., Kent D.V., Flynn J.J. & Van Couvering J.A. 1985. Cenozoic geochronology.—Geological Society of America, Bulletin, 96: 1407–1418.

Black C.C. 1978. Paleontology and geology of the Badwater Creek area, central Wyoming, part 14. The artiodactyls.—Annals of Carnegie Museum, 47: 223–259.

Coney P.J. 1975. Structure, volcanic stratigraphy, and gravity across the Mogollon Plateau, New Mexico.—New Mexico Geological Society, Special Publication 5: 29–41.

Douglass E. 1905. The Tertiary of Montana.—Carnegie Museum, Memoir 2: 203–224.

Elston W.E. 1957. Geology and mineral resources of Dwyer quadrangle, Grant, Luna, and Sierra Counties, New Mexico.—New Mexico Bureau of Mines & Mineral Resources, Bulletin 38: 1–96.

Ericksen G.E., Wedow H. Jr., Eaton G.P. & Leland G.R. 1970. Mineral resources of the Black Range Primitive Area, Sierra, and Catron Counties, New Mexico.—U.S. Geological Survey, Bulletin 1319-E: 1–162.

Ferrusquia-Villafranca I. 1969. Rancho Gaitan local fauna, early Chadronian, northeastern Chihuahua.—Sociedad Geologica de Mexico, Boletin, 30(2): 99–138.

Ferrusquia-Villafranca I. & Wood A.E. 1969. New fossil rodents from the early Oligocene Rancho Gaitan local fauna, northeastern Chihuahua, Mexico.—Texas Memorial Museum, The Pearce-Sellards Series no. 16: 1–13.

Fodor R.V. 1976. Volcanic geology of the northern Black Range, New Mexico.—New Mexico Geological Society, Special Publication 5: 68–70.

Gazin C.L. 1955. A review of the upper Eocene Artiodactyla of North America.—Smithsonian Miscellaneous Collections, 128(8): 1–96.

Golz D.J. 1976. Eocene Artiodactyla of California.—Los Angeles County Museum of Natural History, Science Bulletin 26: 1–85.

Hedlund D.C. 1977. Geologic map of the Hillsboro and San Lorenzo quadrangles, Sierra and Grant Counties, New Mexico.—U.S. Geological Survey, Miscellaneous Field Studies Map 900-A.

Jicha H.L. Jr. 1954. Geology and mineral deposits of Lake Valley quadrangle, Grant, Luna, and Sierra Counties, New Mexico.—New Mexico Bureau of Mines & Mineral Resources, Bulletin 37: 1–93.

Loring A.K. & Loring R.B. 1980. K/Ar ages of middle Tertiary rocks from southern New Mexico.—Isochron/West, no. 28: 17–19.

Lucas S.G. 1983. The Baca Formation and the Eocene–Oligocene boundary in New Mexico.—New Mexico Geological Society, Guidebook 34: 187–192.

Marvin R.F. & Cole J.C. 1978. Radiometric ages: compilation A, U.S. Geological Survey.—Isochron/West, no. 22: 3–14.

Maxwell C.H. & Heyl A.V. 1976. Geology of the Winston quadrangle, New Mexico.—U.S. Geological Survey, Open-file Map 76-858, scale 1:24,000.

New Mexico Geological Society 1982. New Mexico geologic highway map, scale 1:1,000,000.

Prothero D.R. 1985. Chadronian (early Oligocene) magnetostratigraphy of eastern Wyoming: implications for the age of the Eocene–Oligocene boundary.—Journal of Geology, 93: 555–565.

Prothero D.R. 1986. A new oromerycid (Mammalia, Artiodactyla) from the early Oligocene of Montana.—Journal of Paleontology, 60: 458–465.

Prothero D.R., Denham C.R. & Farmer H.G. 1982. Oligocene calibration of the magnetic polarity time scale.—Geology, 10: 650–653.

Smith L.N., Lucas S.G. & Elston W.E. 1985. Paleogene stratigraphy, sedimentation and volcanism of New Mexico. *In* Flores R.M. & Kaplan S. (eds.), Cenozoic paleogeography of the west-central United States.—Society of Economic Paleontologists and Mineralogists, Rocky Mountain Section, Denver, pp. 293–315.

Wilson J.A. 1971. Early Tertiary vertebrate faunas, Vieja Group, Trans-Pecos Texas: Agriochoeridae and Merycoidodontidae.—Texas Memorial Museum, Bulletin 18: 1–83.

Wilson J.A. 1974. Early Tertiary vertebrate faunas, Vieja Group and Buck Hill Group, Trans-Pecos Texas: Protoceratidae, Camelidae, Hypertragulidae.—Texas Memorial Museum, Bulletin 23: 1–34.

Wood A.E. 1974. Early Tertiary vertebrate faunas, Viega Group, Trans-Pecos Texas: Rodentia.—Texas Memorial Museum, Bulletin 21: 1–112.

Wood A.E. 1980. The Oligocene rodents of North America.—American Philosophical Society, Transactions, 70(5): 1–68.

Woodard T.W. 1982. Geology of the Lookout Mountain area, northern Black Range, Sierra County, New Mexico (M.S. thesis).—University of New Mexico, Albuquerque, 95 pp.

Headframe of U.S. Treasury mine near Chloride, late 1909. Photo Henry Schmidt, New Mexico Bureau of Mines & Mineral Resources Collection, donated by R.H. Jahns.