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THE PLIOCENE RODENT *MICROTOSCOPTES DISJUNCTUS* (WILSON) FROM IDAHO AND WYOMING

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THE PLIOCENE RODENT *MICROTOSCOPTES DISJUNCTUS* (WILSON) FROM IDAHO AND WYOMING

CLAUDE W. HIBBARD

ABSTRACT—A lower jaw of *Microtoscoptes* with M_1 and M_2 from Idaho and the first known fragmentary maxillary with M^1 and M^2 from Wyoming are figured. Occlusal lengths of teeth are given.

INTRODUCTION AND ACKNOWLEDGMENTS

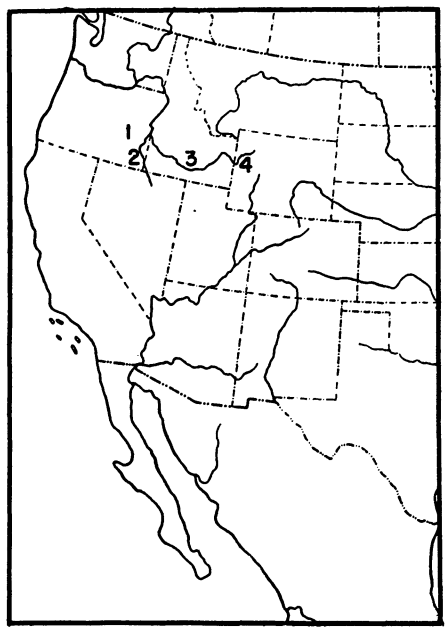
THE ABERRANT arvicoline? rodent *Microtoscoptes* is poorly known from the Pliocene of Asia and North America. Schaub (1934) described *Microtoscoptes praetermissus* based upon an isolated left M_1 and M_3 from Olan Chorea, Mongolia. Wilson (1937) described *M. disjunctus,* which is larger than the genotype, from Malheur County, Oregon (text-fig. 1, loc. 2). The original description was based upon an incomplete left jaw bearing M_1-M_2 and a fragment of another left jaw with M_2.

The second discovery of *Microtoscoptes* in North America was by members of the United States Geological Survey prior to 1956 in the Teewinot Formation (Love, 1956a, 1956b) from Teton County, Wyoming (text-fig. 1, loc. 4). A potassium-argon date of 9.2×10^6 years was determined from obsidian grit 106′ stratigraphically below the bed from which *Microtoscoptes* was taken (Evernden *et al.,* 1964, KA929).

In the summer of 1956 H. E. Malde and D. W. Taylor recovered part of a right lower jaw with the incisor, M_1 and M_2 from the Hole-in-the-wall Diatomite bed interbedded in the Banbury basalt in the NE¼ sec. 3, T. 4S., R. 13W., Gooding County, Idaho (text-fig. 1, loc. 3). I was asked at the time to report its occurrence. I delayed publication since I learned that a potassium-argon age of the volcanic ash associated with the diatomite was being determined (Evernden *et. al.,* 1964, KA830, date 10.0×10^6 years).

Shotwell (1963) reported a left M_2 of this rodent from the Bartlett Mountain local fauna, Harney County, Oregon (text-fig. 1, loc. 1). C. A. Repenning (1968) has collected additional specimens from the type locality in Malheur County, Oregon (text-fig. 1, loc. 2).

The upper dentition of this rodent was unknown so I contacted Dave Love of the United States Geological Survey (U.S.G.S.) and arranged to get some fossil-bearing matrix from the U.S.G.S. Cenozoic locality 20766, where the previous specimens were recovered in Teton County, Wyoming (text-fig. 1, loc. 4).



TEXT-FIG. 1—Geographical occurrence of *Microtoscoptes disjunctus* (Wilson). 1, Bartlett Mountain local fauna, Harney County, Oregon. 2, Rome local fauna, Malheur County, Oregon. 3, Stroud Claim local fauna, Gooding County, Idaho. 4, Kelly Road local fauna, Teton County, Wyoming.

The fossil-bearing matrix was removed July 9, 1964, and taken to the Will Faris Ranch near Bondurant, Wyoming, for screen washing. It was found that the matrix contained enough diatomite and pumicite so that it would not break down in water. The matrix was crated and shipped to The University of Michigan.

Various wetting agents and kerosene were used in trying to break down the matrix. Because of the porous condition it was found that the only way to break it down was to soak the matrix in water and freeze. It was then thawed. This treatment was repeated many times until the matrix was reduced to small flakes. This treatment also resulted in the disassociation of the teeth from the jaws. All of the matrix has not been sorted, but there have been recovered parts of 44 isolated teeth, part of a right jaw with M_1 and M_2, and part of a right maxillary with M^1 and M^2. The specimens reported contribute to our knowledge of this poorly known rodent.

I wish to thank William G. Melton, Jr., Philip R. Bjork, Jack C. Schuster and Richard J. Zakrzewski, members of the 1964 field crew, who helped to collect the fossil-bearing matrix in Teton County, Wyoming. I am especially indebted to William G. Melton, Jr. for taking care of the freezing process used on the matrix.

I wish to thank Edward Lewis of the United States Geological Survey for permission to publish the correction that he had furnished me regarding the *Dipoides* from the Stroud Claim local fauna of Gooding County, Idaho.

Financial support to me for the field work during the summer of 1964 was provided by NSF (Project G.B.–1528), and the line drawings by Alice R. Ballard were provided by NSF (Project G.B.–5450).

In this report the abbreviations used are as follows: U.S.G.S. (United States Geological Survey); U.S.N.M. (United States National Museum); U.M.M.P. (University of Michigan Museum of Paleontology)—all U.M.M.P. numbers are preceded by the letter V.

DESCRIPTIONS

MICROTOSCOPTES DISJUNCTUS (Wilson)

Text-figs. 2A-K

The fragmentary right jaw with M_1-M_2, No. 22755 United States National Museum from the Stroud Claim local fauna of Gooding County, Idaho, is that of an adult. The jaw had been injured in the area of the anterior part of the symphysis as evidenced by the exostosis (text-fig. 2K). The injury had healed and the wear on the teeth appears normal. The occlusal length of M_1-M_2 is 4.69 mm. M_1 has an occlusal length of 2.64 mm.

The upper and lower masseteric crests are as those described by Repenning (1968, fig. 8-1b) for the left jaw, No. 23719 U.S.N.M., from the Rome local fauna, Oregon (text-fig. 1, loc. 2). The arvicoline groove (Repenning, 1968, p. 51) is absent.

This specimen differs from those taken with the Kelly Road local fauna (*n. name*) at the U.S.G.S. Cenozoic locality 20766, Teton County, Wyoming, in that the second and third triangles of M_1 are not as confluent (text-fig. 2K).

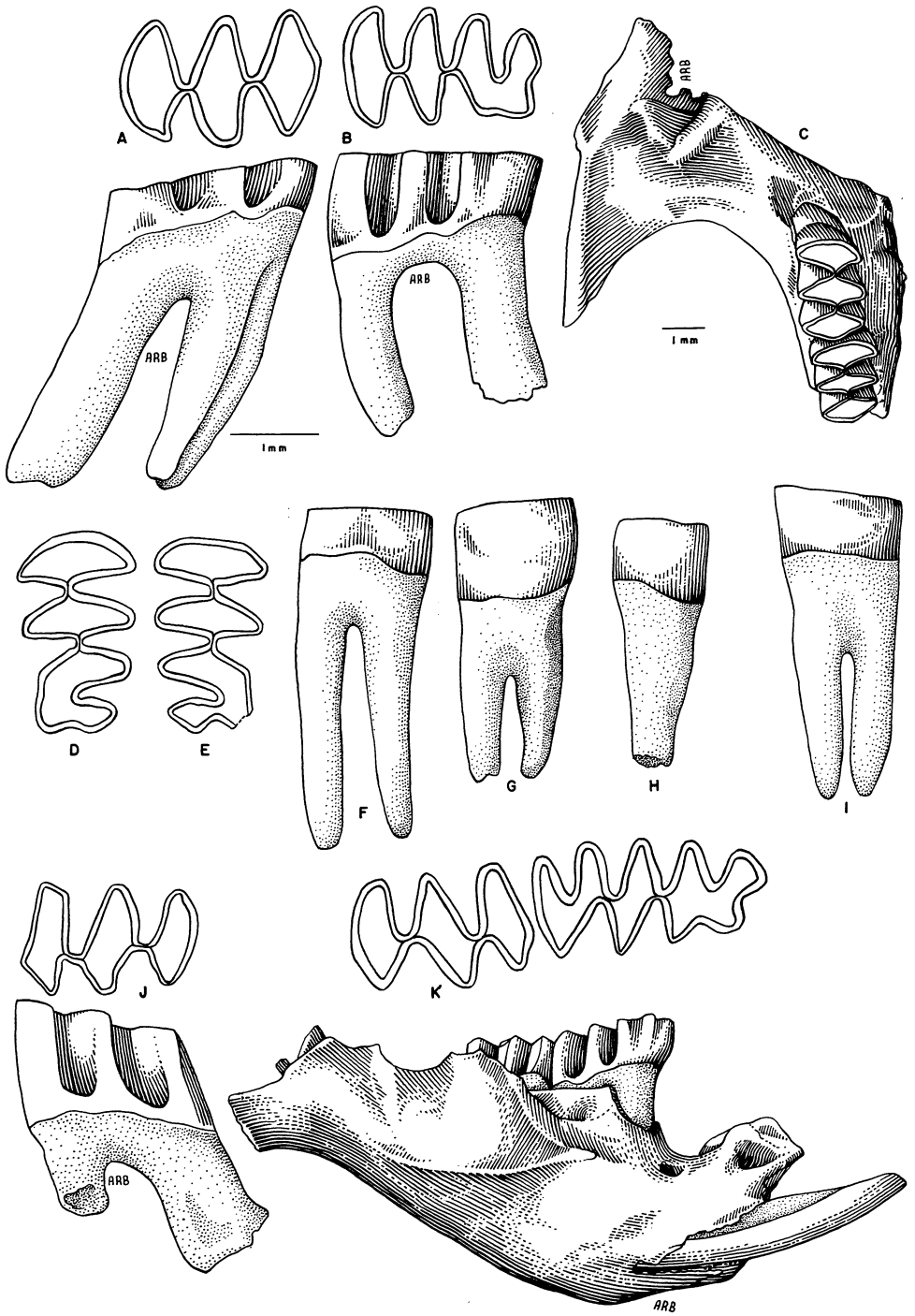
The isolated lower molars recovered at U.S.G.S. Cenozoic locality 20766 agree in dental pattern with those figured and described by Hibbard (1959). Thirty-nine of the teeth were complete enough for occlusal length measurement. It has been observed that the teeth with the shortest occlusal surface are those of immature individuals and those with the longest occlusal length are those of old adults. The occlusal length of eight right and five left M_1s varied from 2.35–2.74 mm; the average is 2.54 mm. Four left M_2s varied from 1.93–2.07 mm; the average is 1.97 mm. Two left M_3s were recovered. One, an immature individual, had an occlusal length of 1.75 mm. The other M_3 is that of an adult (text-fig. 2J). Its occlusal length was 2.00 mm. There are six left M^1s and three right M^1s. Their occlusal length varied from 2.09–2.37 mm; the average is 2.28 mm. Four right M^2s varied from 1.97 to 2.25 mm; the average is 2.11 mm. There are four right M^3s and three left M^3s (text-figs. 2D, E), their occlusal lengths varying from 1.93 to 2.31 mm. The average is 2.19 mm.

The fragmentary right lower jaw (U.M.M.P. V57131) of an old adult contains M_1 and M_2. Their occlusal lengths are: M_1, 2.68, and M_2, 2.43 mm.

The fragmentary right maxillary, V57110 (text-fig. 2C), is most interesting since the maxillary root of the zygoma does not leave the maxillary in the angular position as in other arvicoline rodents. It leaves the maxillary at nearly a right angle and reminds one of the zygoma in the Dipodidae, but the muscle attachments are entirely different.

The occlusal length of M^1 and M^2 is 4.43 mm. The length of M^1 is 2.40 mm. The confluent triangles of the upper molars are separated from the anterior loop and other confluent triangles by a thin connection of enamel. This thin enamel connection extends to the base of the crown and is transparent. This transparent connection is like that of the lower molars reported by Hibbard (1959). In adult patterns there is no evidence of dentine connections between the pairs of confluent triangles. In very old patterns the enamel pits at the base of the crown of the tooth wear to enamel islands.

If *Microtoscoptes* is an arvicoline rodent, then M^1 consists of an anterior loop with the



TEXT-FIG. 2—Dentition of *Microtoscoptes disjunctus:* A, F, V57117, left M^1, occlusal, lingual and posterior views, × 12. B, G, H, V57113, right M^3, occlusal, labial, anterior and posterior views, × 12. C, I, V57110; C, part of right maxillary with M^1 and M^2, × 6; I, posterior view of M^2, × 12. D, V57112, right M^3, occlusal view, × 12. E, V57111, left M^3, occlusal view, × 12. J, V57118, left M_3, occlusal and labial views, × 12. K, USNM 22755, part of right jaw with M_1 and M_2, × 6; occlusal view, × 12.

first and second triangles opposite and confluent, and so are the third and fourth triangles. The anterior root supports the anterior loop. The lingual root supports the first and third triangles (text-figs. 2A, F). The greatest support of this root is under the first triangle as in *Pliophenacomys* and *Ogmodontomys;* a very slight support for the anterior part of the third triangle occurs in *Pliopotamys*. In Recent *Ondatra* the lingual root is fused with the anterior root and supports the first triangle, while the posterior root supports the third and fourth triangles.

The anterior loop of the three M^2s is supported by two roots that are fused nearly to their tips. The posterior root or roots are missing. But specimen V57110 (text-fig. 2I) has two posterior roots. M^3 has two anterior roots and one posterior root (text-figs. 2B, G, H).

SUMMARY

The rare Hemphillian (Middle Pliocene) rodent *Microtoscoptes disjunctus* is known from two localities in Oregon, one in Idaho and one in Wyoming. The specimens from the U.S.G.S. Cenozoic locality 20766 in Teton County, Wyoming, represent the largest collection of remains of this species. The fragmentary right maxillary is the first part of the skull to be reported. The development of the maxillary root of the zygoma is different than in any other known arvicoline rodents.

I agree with Repenning (1968) that the inclusion of *Microtoscoptes* in the Arvicolinae is best considered an indication of morphologic similarity and not of phylogenetic affinities. A good palate with the zygomatic arch present would contribute much to the understanding of its relationship to other rodents.

Repenning's analysis of the large Rome local fauna and the occurrence of *Microtoscoptes* in these sediments with other members of the fauna seems to suggest that *Microtoscoptes* was an aquatic rodent.

The deposit of the Teewinot Formation at the site of recovery of *Microtoscoptes* in Teton County, Wyoming, indicates that the deposition occurred in a marsh habitat by the remains of fossil birds' egg shells, the presence of a small shrew, *Hesperosorex lovei* Hibbard (1958), a small cricetine rodent, and *Dipoides,* a small beaver.

All specimens of *Microtoscoptes* have been found associated with remains of beavers. In all cases except the specimen taken in Harney County, Oregon (text-fig. 1, loc. 1), they have occurred with the beaver, *Dipoides*.

Shotwell (1963, p. 73) found it associated with the small beaver *Hystricops browni* Shotwell, in the Bartlett Mountain local fauna of Harney County, Oregon.

I wish to make the following correction in Malde & Powers (1962, right column, bottom of page 1204) and in Evernden *et al.* (1964, p. 183, under KA830) concerning the Stroud Claim local fauna of Gooding County, Idaho (text-fig. 1, loc. 3).

Edward Lewis wrote me on May 23 and June 10, 1963, that because of an inadvertent lapse in typist's copy of part of a letter from T. M. Stout for use in the paper of Malde & Powers, the following six words were omitted:

stirtoni Wilson found associated with *Ambelodon,*

so they should be inserted. The second sentence should read as follows: "It is nearly identical to the right M^1 in a skull of *Dipoides stirtoni* Wilson found associated with *Ambelodon fricki* from near Cambridge, Nebraska."

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