A Sciuravid Rodent from the Middle Eocene of Wyoming

By Mary R. Dawson

Studies on rodents from the middle Eocene Bridger formation of Wyoming have revealed a previously unknown dental pattern for a sciuravid in a specimen in collections of the American Museum of Natural History. Thanks are given to Dr. Malcolm C. McKenna for permission to study this specimen and to Dr. C. Lewis Gazin of the United States National Museum for stratigraphic information.

Material: A.M.N.H. No. 12118, incomplete maxilla with P3–M1, moderately worn; upper Bridger of Twin Buttes (C5 of Matthew, white stratum), Bridger Basin, Wyoming.

A precise taxonomic assignment has not been made for No. 12118. Upper jaw material only is known, and this specimen might be found to belong with the lower jaw of an already named sciuravid. Table 1 shows the stratigraphic distribution and known jaws of named sciuravids from the Bridger formation, based mostly on specimens in the American Museum of Natural History, Yale Peabody Museum, and the United States National Museum. Collections of the Academy of Natural Sciences of Philadelphia, Carnegie Museum, Princeton University, and University of Wyoming also have been consulted.

Described sciuravid upper jaws, including No. 12118, are too large to be associated with Sciuravus bridgeri and the two species of Pauromys. Size and stratigraphic occurrence allow association of Taxymys lucaris

1 Department of Zoology, Smith College, Northampton, Massachusetts. The present study was supported by research grant G-14254 from the National Science Foundation.
with *Tillomys senex*, but this possible association has not been verified. On the basis of over-all size, No. 12118 could be associated with lower jaws of *Tillomys senex* and *Sciuravus? rarus*. Association with *S.? rarus* seems unlikely, however, owing to the distinct reduction of P₄ in that species, which seems to prohibit occlusion with No. 12118.

Reference of No. 12118 (fig. 1) to the family Sciuravidae is supported by the structure of M¹, in which the hypocone is subequal to the protocone and is separated from the protocone lingually by a distinct valley. The outline of the first molar is roughly quadrate. Its buccal wall is slightly concave. The ridged anterior cingulum is separated from the paracone and projects as a parastyle buccally. A meso-style partially blocks the V-shaped valley between paracone and metacone. A loph extends posterolingually from the paracone to come in contact with the worn protocone. The protoconule seems to be represented by a projection from the protocone into the anterior valley. The metaloph curves anterolingually from the metacone to the anterobuccal edge of the hypocone. At this stage of wear protocone and hypocone are joined near the center of the tooth. A valley is enclosed between the metacone-metaloph and the posterior cingulum.

The premolars of No. 12118 are distinctive, causing an earlier observer of the specimen, perhaps W. D. Matthew, to write on its catalogue card, "Rodent! small P₄, large P₃." The high central cusp on P₃ has a wear surface facing posteroventrally. A shelf occurs anteromedial to this cusp, and a larger shelf encircles the tooth posteriorly. The fourth premolar has a single buccal cusp, the paracone,
### TABLE 1

**Stratigraphic Distribution and Known Jaws of Sciuravids from the Bridger Formation**

<table>
<thead>
<tr>
<th>Species</th>
<th>Level in Bridger</th>
<th>Known Jaws</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Sciuravus nitidus</em></td>
<td>Lower and upper Bridger</td>
<td>Upper and lower jaws associated; most abundant Bridger sciuravid</td>
</tr>
<tr>
<td><em>S. bridgeri</em></td>
<td>Lower Bridger</td>
<td>Lower jaws</td>
</tr>
<tr>
<td><em>S.? rarus</em></td>
<td>Not definitely known, probably upper Bridger</td>
<td>Lower jaw</td>
</tr>
<tr>
<td><em>Taxymys lucaris</em></td>
<td>Upper lower and upper Bridger</td>
<td>Upper jaws</td>
</tr>
<tr>
<td><em>Taxymys? progressus</em></td>
<td>Not definitely known</td>
<td>Upper jaw</td>
</tr>
<tr>
<td><em>Tillomys senex</em></td>
<td>Upper lower and upper Bridger</td>
<td>Lower jaws</td>
</tr>
<tr>
<td><em>Tillomys? parvidens</em></td>
<td>Probably lower Bridger</td>
<td>Lower jaw</td>
</tr>
<tr>
<td><em>P. perditus</em></td>
<td>Probably lower Bridger</td>
<td>Lower jaw</td>
</tr>
<tr>
<td><em>P. schaubi</em></td>
<td>Probably lower Bridger</td>
<td>Lower jaw</td>
</tr>
</tbody>
</table>

* This species probably belongs to a genus distinct from *Sciuravus*.
* Wilson, 1938.
* Dry Creek.
* Twin Buttes, red stratum.

rather than the paracone and metacone found on *P* in other sciuravids. A ridge extends linguad from the anteromedial side of the paracone to the protocone. On the posterior flank of the paracone there is a worn area from which a second ridge extends to the protocone. The two ridges enclose a shallow basin. The valley between the posterior ridge and the posterior cingulum is divided into buccal and lingual parts by a worn area that connects ridge and cingulum. Anterior and posterior cingula are in contact with the protocone; a slight posterolingual convexity on the posterior cingulum may represent a hypocone. This structure of *P* could be primitive, representing a stage before the molarization of the tooth had progressed as far as the development of a metacone. An early Eocene paramyid from the lower Gray Bull (Wood and Patterson, 1959, p. 296; Wood, MS) has *P* in a level of development from which that in No. 12118 could have been derived without having gone through a stage with a metacone. In the absence of intermediates such a derivation cannot be proved, but the evidence is suggestive. If
No. 12118 were derived from a primitive paramyid lacking a metacone on P₄, the question is raised of the origin of the metacone on P₄ in other sciuravids. Was a single buccal cusp on P₄ found in the ancestral sciuravid, with later development of a metacone in some sciuravid lines and the retention of the primitive premolar condition in a line represented by No. 12118? Did rodents recognized as sciuravids arise from different paramyid groups, one having a single buccal cusp on P₄ and another having paracone and metacone developed on that tooth? As yet earlier Eocene sciuravids do not answer these speculative questions.

Another alternative is that P₄ in No. 12118 is undergoing reduction. The worn area on the posterior flank of the paracone may represent a reduced metacone. Evidence that may oppose this alternative is the relatively well-developed P₃, which might be expected to be smaller if general premolar reduction were taking place.

Within the Bridger the premolar structure of No. 12118 separates it from sciuravids known by upper teeth, Sciuravus and Taxymys (see Wilson, 1938, figs. 1–2, 13–15). Differences from these genera are exhibited by M¹ also. In M¹ of No. 12118 the buccal part of the anterior cingulum is more distinctly raised into a parastyle, and the buccal side of the tooth is concave, rather than slightly convex. The paracone, mesostyle, and metacone are more ridged and less cuspatate than those of Sciuravus. In Taxymys protoloph and metaloph are more directly transverse in orientation.

Some later rodents have on P₄ a large buccal cusp somewhat similar to that in No. 12118. Platypittamys, a lower Oligocene South American octodontid, was described by Wood (1949, pp. 16–18) as having a primitive P₄ with “an undivided buccal amphicone.” Other than having a large buccal cusp, however, P₄ in Platypittamys does not show much resemblance to that in No. 12118. The later interpretation by Wood and Patterson (1959, pp. 296–297) of Platypittamys as having widely separated buccal paracone and metacone on P₄, rather than a

### TABLE 2
MEASUREMENTS (IN MILLIMETERS) OF A.M.N.H. NO. 12118

<table>
<thead>
<tr>
<th></th>
<th>Anteroposterior</th>
<th>Transverse</th>
</tr>
</thead>
<tbody>
<tr>
<td>P³</td>
<td>1.2</td>
<td>1.1</td>
</tr>
<tr>
<td>P₄</td>
<td>1.5</td>
<td>2.1</td>
</tr>
<tr>
<td>M¹</td>
<td>1.9</td>
<td>2.1</td>
</tr>
</tbody>
</table>
buccal "amphicone," further separates *Platypittamys* from No. 12118. *Tataromys* from the upper Oligocene of Mongolia (Matthew and Granger, 1923, pp. 5–6) has a large buccal cusp on \( P^4 \). The similarity to No. 12118 is interesting, but it may be only superficial and is not necessarily indicative of relationship between No. 12118 and *Tataromys*. In both *Platypittamys* and *Tataromys* \( P^3 \) is absent, and thus premolar reduction has progressed farther than in No. 12118. The pattern of \( P^4 \) in *Platypittamys* and *Tataromys* may reflect reduction also. Such reduction of \( P^4 \) has been suggested as possible for *Platypittamys* (Wood and Patterson, 1959, pp. 297–298) and is considered by Bohlin (1946, p. 131) to account for the structure of that tooth in *Tataromys*.

It is hoped that additional specimens will allow a more complete understanding of the morphology and taxonomic position of the rodent represented by A.M.N.H. No. 12118.

REFERENCES

**Bohlin, Birger**

**Matthew, W. D., and W. Granger**

**Wilson, R. W.**

**Wood, A. E.**


**Wood, A. E., and B. Patterson**

**Wood, H. E., 2nd, et al.**