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ARTICLE 1

THE LOWER ANTEMOLAR TEETH OF *LITOLESTES* *IGNOTUS*, A LATE PALEOCENE ERINACEID (MAMMALIA, INSECTIVORA)

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INTRODUCTION

Jepsen (1930) first described *Litolestes ignotus* from the Late Paleocene Silver Coulee beds of the Polecat Bench Formation, Wyoming, and referred it, with question, to the Insectivora. From the holotype at Princeton University (PU 13352) and the paratype (PU 13348)—lower jaws without the complete antemolar dentition—Jepsen suggested that the dental formula of *L. ignotus* was $? , ? , 4 , 3$.

New and more complete material of *L. ignotus* from the Polecat Bench described in a recent study of early Tertiary lipotyphlan insectivores (Krishtalka, 1975) sheds light on the affinities of *L. ignotus* and the nature of its antemolar dentition. *L. ignotus* is a late Paleocene species of the Family Erinaceidae. A full description of *L. ignotus* and its erinaceid relationships will appear elsewhere (Krishtalka, in prep.). One specimen of *L. ignotus* (PU 14333) preserves most of the lower antemolar dentition and suggests the presence of five premolars.

DESCRIPTION

PU 14333 (Figs. 1, 2, 3) is a partial left dentary which preserves M_1 , seven antemolar teeth, and an alveolus that is four loci anterior to M_1 .

The first three teeth are incisiform and single-rooted, with spatulate, procumbent crowns. The crown of I_1 and the medial half of I_2 are

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damaged. On I_2 , however, two small lateral lobes are distinct from the remainder of the crown. I_3 is complete and trilobate.

The tooth posterior to I_3 is single-rooted and premolariform. The crown is laterally compressed along the dorsal surface, but widens and is elliptical in cross section basally. In lateral view the crown resembles a rectangle oriented anterodorsally, with long, parallel, posterodorsal and posteroventral slopes, and a short, connecting anterior slope. A tiny heel occurs at the base of the posterodorsal slope.

A single alveolus occurs posterior to this tooth, in the position of the fourth tooth anterior to M_1 . On PU 19387, left partial dentary of *L. ignotus*, the alveolus in this position contains a single large root.

Two nearly identical premolariform teeth occur posterior to the alveolus on PU 14333 and PU 19387. These teeth are two-rooted, and triangular in lateral aspect, with a dominant protoconid and a tiny heel. There is no trace of a metaconid. The paraconid is incipiently present as a slight lingual inflection of the anterior part of the base of the protoconid.

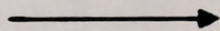
The last premolariform tooth is as large as M_1 , and bears a large protoconid, a small anterolingual paraconid, and a metaconid on the lingual face of the protoconid. The talonid is very short, but is as wide as or wider than the trigonid. The talonid basin, a narrow gully between the cristid obliqua and the entocristid, occupies approximately the lingual one-fourth of the width of the talonid.

DISCUSSION

A traditional view of the lower dentition of *Litolestes ignotus* would produce the antemolar dental formula of $I_1 I_2 I_3 C_1 P_1 P_2 P_3 P_4$. However, an equally if not more viable interpretation may be: $I_1 I_2 I_3 P_1 P_2 P_3 P_4 P_5$. We tentatively present the five premolars as permanent teeth, although future research may prove some of them to be deciduous.

We concur with the traditional interpretation that the three anterior teeth are incisors. The presence of accessory lobes does not mask the incisiform nature of these teeth. Similar digitate incisors occur in other mammalian groups (HersHKovitz, 1971; Rose, 1973).

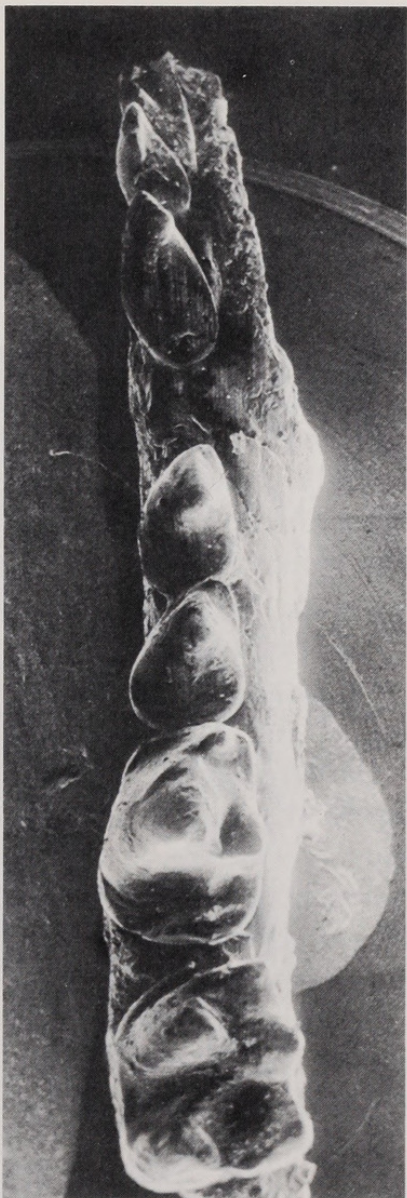
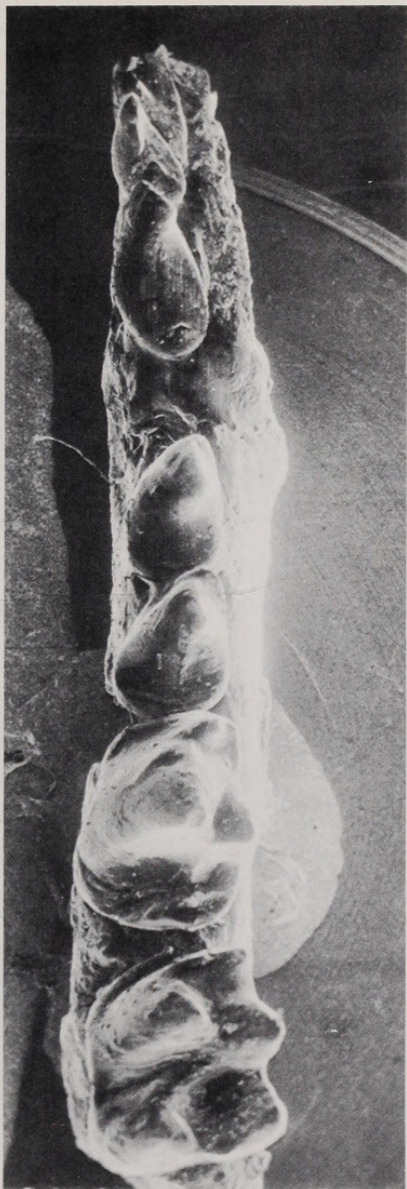
The tooth posterior to this set of incisors is the first of five teeth, of which the four preserved are premolariform. Although a tooth of premolar morphology at this locus is usually interpreted as a premolariform canine (e.g. Rose, 1973) there is no *a priori* reason to do so. Rather, the tooth can equally and more parsimoniously be considered



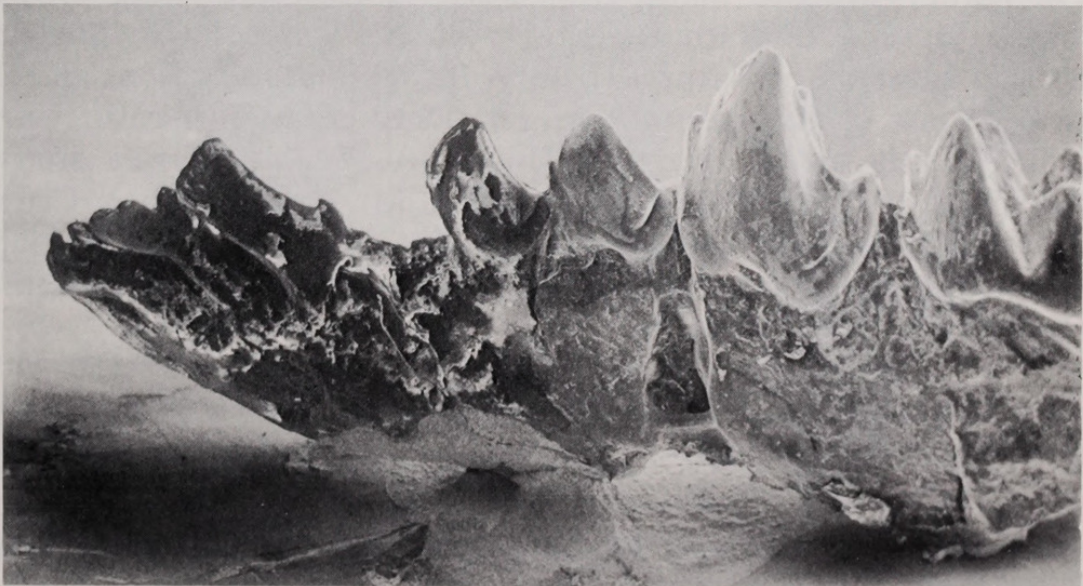
Figures 1, 2. *Litolestes ignotus*, PU 14333, left mandible, Polecat Bench Formation, scanning electron micrographs. 1. Stereophotographs, occlusal view, approx. X 12. 2. Lateral view, approx. X 12.

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a P_1 , with concomitant loss of the canine. The lower jaw of *Litolestes ignotus* may thus possess five premolar loci, as is the case in *Kennalestes* (McKenna, 1976), *Gypsonictops* (Lillegraven, 1969; Clemens, 1973), and many Paleocene and Eocene primates (Schwartz, in press). The presence of five premolar loci need not imply phylogenetic affinity among the latter forms. It does, however, suggest a primitive condition from which *Litolestes* as well as certain Paleocene and Eocene primates could have retained five premolar loci. *Kennalestes*, *Gypsonictops*, plesiadapiforms, and omomyids also possess a demonstrably caniniform tooth anterior to the first of five premolariform teeth. Among these forms, only *Kennalestes* and *Gypsonictops* possess demonstrably incisiform teeth anterior to the canine. These Cretaceous mammals exhibit a complement of teeth that may reflect the primitive condition for other therian groups. From such a condition—an incisor set, a canine, and five premolars—the sequence of lower antemolar teeth of *L. ignotus* can be derived by loss of the canine, rather than by invoking a morphogenetic field to explain loss of a premolar and transmutation of the canine to a tooth of premolariform morphology (cf. Butler, 1939, 1963; Patterson, 1956; Van Valen, 1970). Conversely, plesiadapiforms and omomyids have retained the canine but have lost the incisors.

The sequence and morphology of the antemolar teeth of the dermopteran *Plagiomene* (Fig. 4) are remarkably similar to those of *L. ignotus*, including the presence of an unquestionably premolariform tooth immediately following the last incisor (Rose, 1973). We offer a similar interpretation of the dental formula (and its derivation) of the lower antemolar teeth of *Plagiomene*.

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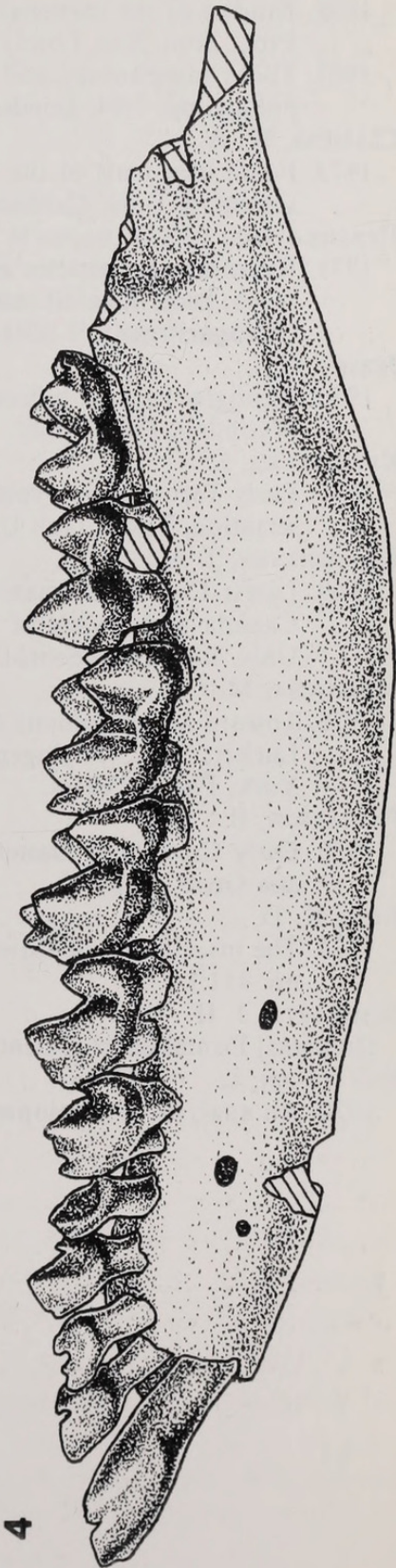


Figure 3. *Litolestes ignotus*, PU 14333, enlargement of anterior end of mandible, scanning electron micrograph.

Figure 4. *Plagiomene multicuspis*, PU 14552, lateral view, approx. X 4, (redrawn to scale from Rose, 1973).



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