

St. Norbert College

Digital Commons @ St. Norbert College

Student Presentations

St. Norbert Collaborative Center for
Undergraduate Research

2022

A Taxonomic Revision and Characterization of *Sciuravus nitidus* and *S. undans* (Rodentia; Sciuravidae), early to middle Eocene Rodents from the Bridger Formation, Green River Basin, Wyoming

Emily Mazier

Follow this and additional works at: https://digitalcommons.snc.edu/collaborative_presentations

A Taxonomic Revision and Characterization of *Sciuravus nitidus* and *S. undans* (Rodentia; Sciuravidae), early to middle Eocene Rodents from the Bridger Formation, Green River Basin, Wyoming

Emily M. Mazier and Deborah K. Anderson
Division of Natural Sciences, St. Norbert College, De Pere, WI, USA

INTRODUCTION

Sciuravus nitidus was originally described by Marsh (1871) based on a specimen recovered from the Bridger Formation (middle Eocene) of Wyoming, a maxillary fragment with upper molars (M1-3; YPM 13333). The next mention of *S. nitidus* is by Matthew (1910) who briefly described the skull of the genotype, a description later expanded by Dawson (1961). Wilson's (1938) review of *S. nitidus* includes an amplified description of both the upper and lower teeth of the species, based on his study of a group of Yale specimens. He acknowledges that while these specimens vary considerably in molar crown pattern, it is not possible to sort them into different species due in part to the limited locality data available for this particular group of specimens. The mandible of *S. nitidus* is first well described by Wood (1959) who also clearly describes the morphology for each of the lower teeth and lower incisor.

In the same paper that Marsh (1871) described *S. nitidus*, he introduced a second species, *S. undans* based on a mandible with an incisor and p4-m2 (YPM 13349). This specimen was recovered from the same geological horizon and near the same locality as the aforementioned genotype. Criteria for recognizing the specimen as distinct from *S. nitidus* include the "somewhat" larger size and more distinct molar cusps (Marsh, 1871; p. 122).

MATERIALS & METHODS

Specimens used in this study were collected from the Bridger Formation of the Green River Basin. Cheek teeth were measured to the nearest 0.01 mm using a Bausch and Lomb dissecting microscope fitted with an optical micrometer. For each tooth, we measured the length (AP) and anterior (WML) and posterior width (WHL). For each set of lower dentary specimens, morphological features (see Fig. 1) were noted. Quantitative and qualitative differences and/or similarities were used for species identification.

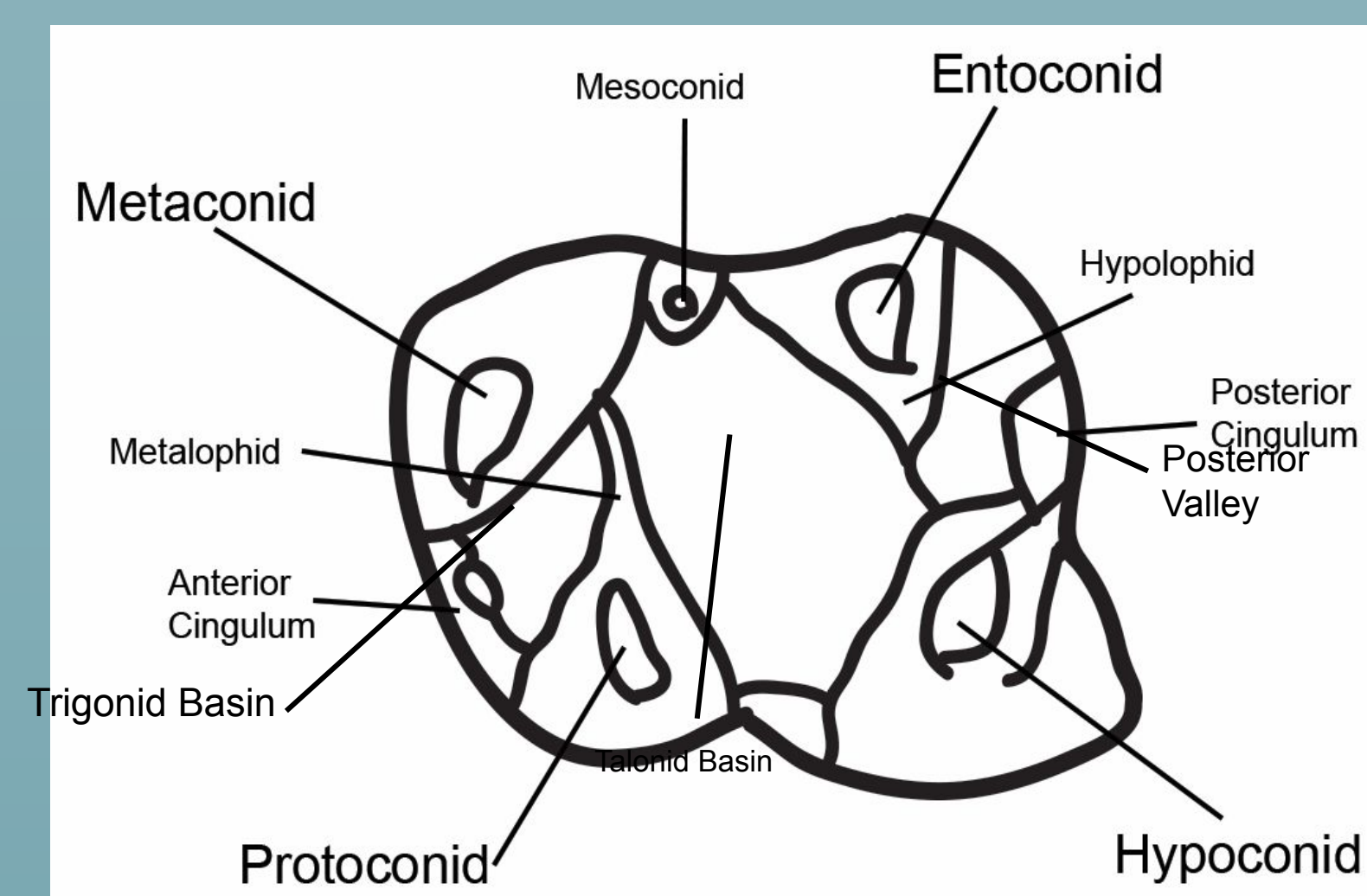


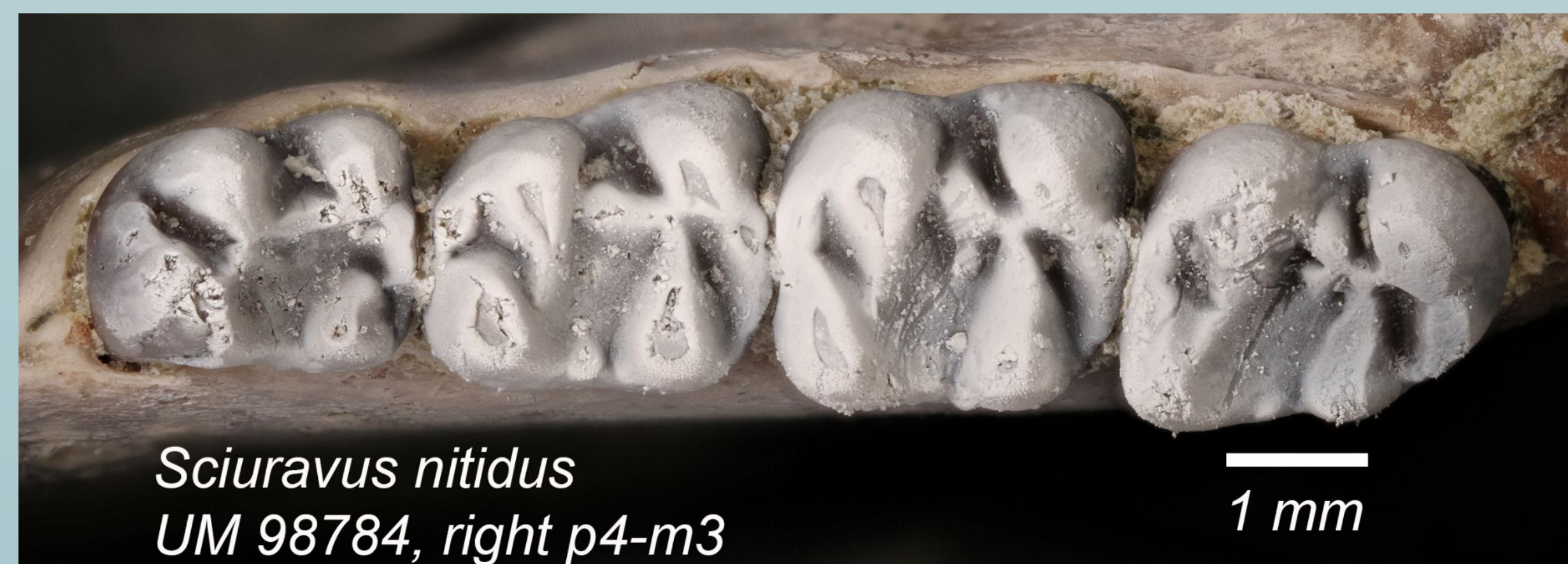
Figure 1. *Sciuravus* dental nomenclature. Left m1.

Terms follow Wilson and Wood, 1935

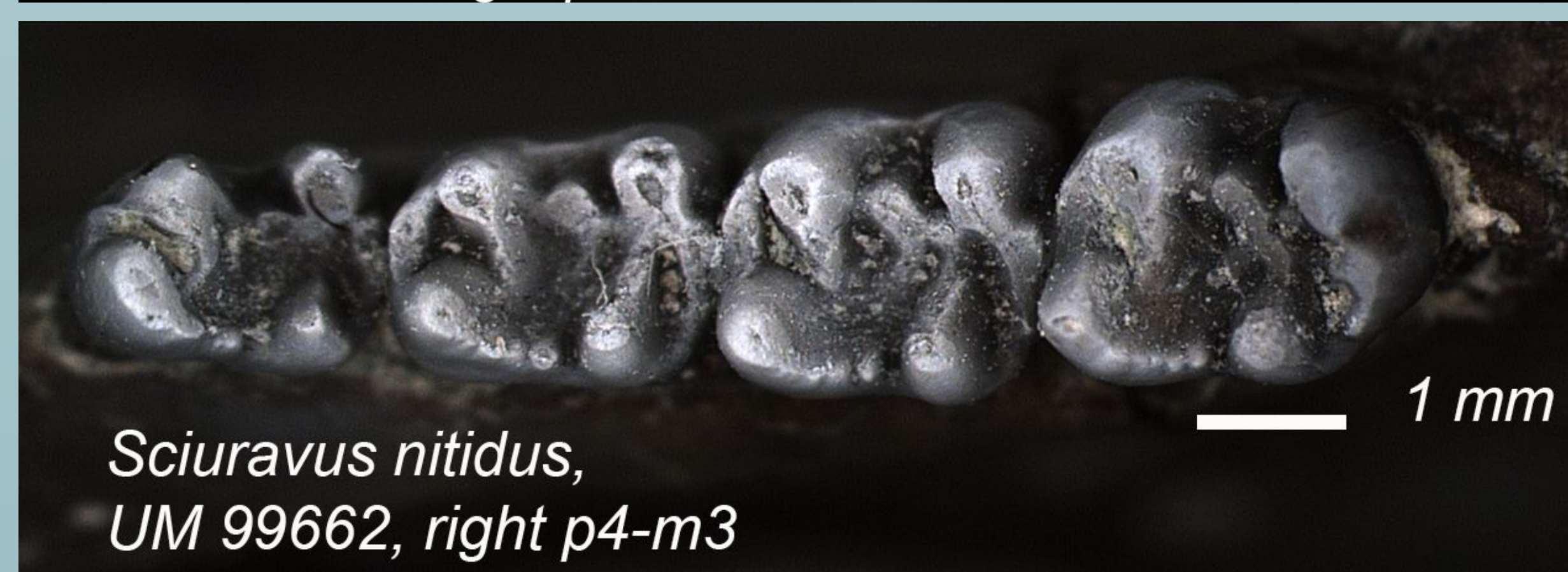
RESULTS



Br3



Br2



Br1

- Narrow and elongate p4
- Distinct mesolophids
- Incomplete metalophid with open trigonid basin on m1
- Complete hypolophid
- No posterior valley division on p4
- Anterior cingulum complete on m1-m3



Br2



Br1

- Short and wide p4
- Rounded cusps
- Complete metalophid with closed trigonid basin on m1
- No mesolophid
- Complete hypolophid
- Posterior valley divided on p4
- Anterior cingulum complete on m1 and m2

GEOLOGICAL SETTING

NALMA	Lithostr. unit	Lithology
Bridgerian	Br2 (middle Bridgerian)	Bridger Formation
	Br1 (early Bridgerian)	Whiskey Butte Bed, Bridger Formation
		Cow Hollow Bed, Lacey Member, Green River Fm.



DISCUSSION

Our results suggest that *Sciuravus undans* should be retained as a distinct species. We have identified several crown pattern features that can be used to distinguish the lower molars from those of several other contemporaneous species of *Sciuravus*, including the genotype, *S. nitidus*. Marsh (1871) noted that *S. undans* was "slightly larger in size" with "more distinct molar cusps" than *S. nitidus*. Our specimen is slightly larger than *S. nitidus* from the same biostratigraphic level, Br1 and has what we would describe as plump cusps relative to those of *S. nitidus*. Other significant differences between *S. undans* and *S. nitidus* include the narrower posterior valleys and trigonid basins, and a more centrally located metastylid.

The original specimen of *S. undans* is from Br2, younger than the one we describe from Br1. They are very similar in size, but the older one is slightly larger. This is similar to the *S. nitidus* specimens from Br2 which are slightly larger than the *S. nitidus* specimens from Br1. It is possible that the cooling event that occurred during Br2 selected for larger individuals over time. Many more specimens need to be studied to confirm this finding.

Among the specimens we studied, there were several that we were unable to classify. These likely represent new species, but more comparisons to extinct species are needed to verify this possibility.

To summarize, a new example of *S. undans* was discovered from Br1 demonstrating that both species co-occur at this time period. And, it is possible that changes in size over time have made it difficult for previous workers to differentiate between *S. nitidus*, *S. undans*, and other named species of the genus.

ACKNOWLEDGMENTS

We would like to thank Dr. Gregg Gunnell[†] of the University of Michigan who originally loaned the fossils.

REFERENCES

- DAWSON, M.R. 1961. The Skull of *Sciuravus nitidus*, a middle Eocene rodent. Yale Peabody Museum of Natural History. 53: 1-13.
- MARSH, O.C. 1871. Notice of some new fossil mammals and birds from the Tertiary formations of the West. American Journal of Science (3) 2:1 20-127.
- MATTHEW, W.D. 1910. On the osteology and relationships of *Paramys* and the affinities of the Ischyromyidae. Bull. Amer. Mus. Nat. Hist. 28: 43-71.
- TROXELL, E.L. 1923. The Eocene rodents *Sciuravus* and *Tillomys*. American Journal of Science 5(29): 383-396.
- WILSON, R. W. 1938. Review of some rodent genera from the Bridger Eocene. Part II. American Journal of Science 35: 207-222.
- WILSON, R.W. and Wood, A.E. 1936. A suggested nomenclature for the cusps of the cheek teeth of rodents. Journal of Paleontology, Vol. 10: 388-391.
- WOOD, A.E. 1959. Rodentia in the geology and paleontology of the Elk Mountain of the Tabernacle Butte area, Wyoming. Bull. Amer. Mus. Nat. Hist. 117: 157-169.