A DIVERSE ASSEMBLAGE OF PALEOCENE NONMARINE MOLLUSKS AND MAMMALS FROM THE SENTINEL BUTTE FORMATION OF NORTH DAKOTA

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Diverse nonmarine mollusk assemblages are uncommon in strata of Paleocene age. A local fauna with more than eight taxa (the average is about four) is usually due to the admixture of freshwater and terrestrial taxa. This communication is the first report of an unusually diverse assemblage of at least 26 taxa of both freshwater and terrestrial mollusks from a Paleocene locality in North Dakota. This assemblage, known as the Riverdale Locality, is in the Sentinel Butte Formation and is middle late Paleocene age. Land mammal age abbreviations used herein are La = Lancian (latest Cretaceous), To and Ti = Torrejonian and Tiffanian (middle and late Paleocene), and Wa = Wasatchian (Early Eocene).

The Riverdale Locality (L1) was discovered on the shores of Lake Sakakawea near Riverdale, McLean County, in the early 1960s by the Vinje family of Hazen (1). Although known primarily for its mammalian fossils (2), a few interesting terrestrial mollusks were part of the original collections (3). The Riverdale Locality of the Vinjes was destroyed by the then rising waters of the reservoir, but lowering lake levels of the late '80s exhumed a comparable lithology in the same (quite specific) location. From available data (2, 4), the Riverdale sites discovered over the last few years (e.g., L5507 and L6200) are stratigraphically, at the most, from 5.8 to 7.9 m above the Vinje's Riverdale Locality, respectively.

The Riverdale molluscan assemblage consists notably of a diverse assemblage of snails (see table; * = land snails). Many, if not most, of the taxa, are undescribed. The named taxa, *Viviparus leai*, *V. retusus*, *Grangerella mcleodensis* (see 5), and New Genus T *planoconvexa* indicate a late Paleocene age. In addition, the terrestrial assemblage is remarkable in that it shares no taxa in common with the Ti3-age Judson local fauna (L6-L8, L25) from near the Slope-Bullion Creek formational contact in Morton County. The record of *G. mcleodensis*, known previously from Paleocene formations of Alberta, is its first report in the United States. The record of New Genus T *planoconvexa* is its first report in North Dakota since it was first described in 1857 from the Sentinel Butte Formation near Fort Berthold on the Missouri River (L4279) (6). The mollusks indicate a moist tropical or subtropical forest near a shallow lacustrine environment associated with a major fluvial system.

The Riverdale Locality (L1) was previously reported as belonging to mammalian biochron Ti4? (early late Tiffanian) (1). A reassessment of the mammalian local fauna identifies the following taxa: Order (O.) Multituberculata — *Ptilodus kummae* (Ti3-Ti4), O. Proteutheria — *Propalaeosinopa* sp. (To3-Ti5), O. Condylarthra — *Phenacodus magnus* (Ti4-Ti5), an indeterminate arctocyonid (La-Wa), and O. Pantodonta — *Titanoides primaevus* (?Ti3-Ti5?). Although a Ti4 biochron is indicated by this fauna, the identification of *P. magnus* at certain localities does not rule out the possibility of a Ti3 age for the Riverdale Locality. Note that this small local fauna does not share any species in common with the Ti3-age Judson and Brisbane (L5385, Slope Formation in Grant County) Localities. This research has been supported by the National Science Foundation, the U.S. Department of Energy, and the U.S. Bureau of Mines.

RIVERDALE MOLLUSKS

Class Bivalvia
- Subclass Heteroconchia
- Order Unionoida
- Family Unionidae
  - Gen. & sp. undet.
- Order Veneroida
- Family Pisidiidae
  - Gen. & sp. undet.

Class Gastropoda
- Subclass Prosobranchia
- Order Diotocardia
- Family Grangerellidae
  - *Grangerella mcleodensis**
- Order Mesogastropoda
- Family Viviparidae
  - *Viviparus leai*
  - *Viviparus retusus*
- Family Hydrobiidae
  - *Hydrobia* spp.
- Family Pleuroceridae
  - *Lioplacodes nebrascensis*
  - *Lioplacodes* sp. B
- Order & Family *incertae sedis*
  - New Gen. A *limneaformis*
- Subclass Pulmonata
- Order Archaeopulmonata
- Family Ellobiidae
  - *Pleurolimnaea tenuicosta*
- Order Basommatophora
- Family Acroloxidae
  - Gen. & sp. undet.
- Family Physidae
  - *Physa* cf. *P. canadensis*
- Family Planorbidae
  - Gen. & sp. undet.
- Order Stylommatophora
- Family undet.
  - New Gen. T *planoconvexa**
- Family Discidae
  - *Discus* cf. *D. sandersoni**
  - *Discus* cf. *D. marmorensis**
- Family Oreohelicidae
  - *Radiocentrum* sp. A*
  - *Gen. undet.* sp. A*
  - *Gen. undet.* sp. B*
- Family Zonitidae
  - cf. *Mesomphix* sp. A*
  - cf. *Vitrea sp. B**
- Stylommatophora *incertae sedis*
  - "Big tree snail" (*?Glypterpes*)*
  - "Carinate helicoid"*
  - "Conic helicoid"*
  - "Bulbous helicoid"*
  - "The Ribmeister"*

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