

Paleocene Mammals and Albert Silberling



The town of Harlowton is located in the Fort Union Geological Formation, which was created about 65 million years ago, shortly after the dinosaur extinction. This once shallow inland sea was formed from rivers originating in the southwestern mountain slopes of Montana. These rivers transferred and deposited sediment collected from the swampy, subtropical eastern coastal plains into the shallow sea. As the rivers shifted over time, swamp vegetation and peat were covered with thick deposits of sand, silt, and clay, which would later form coal. These deposits cemented and compacted into sandstone, siltstone, and mudstone—soft materials that easily erode—leaving few outcrops of more weather-resistant rocks.

The area surrounding Harlowton is also famous for its Paleocene fossils. In 1902, Princeton University paleontologist Earl Douglass and Albert Silberling, a local homesteader and self-taught paleontologist, discovered the fossil remains of primitive mammals in a quarry southwest of Harlowton. Paleontologists excavated that quarry and three others over the next four decades and these sites yielded the remains of at least 23 species, including a squirrel-like animal called *Ptilodus*, the most successful of all mammals.

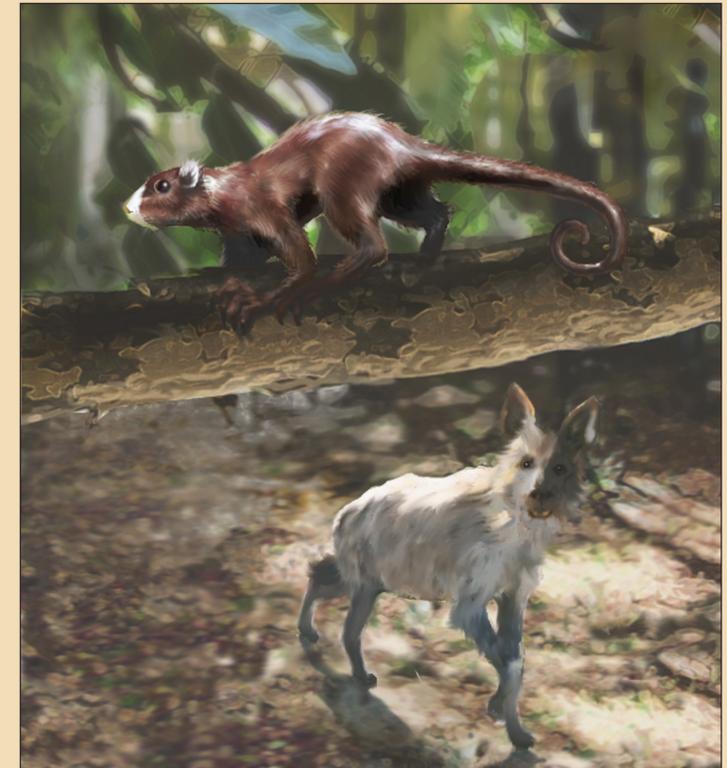
Ptilodus first appeared during the middle Jurassic Age about 160 million years ago and became extinct about 35 million years ago. It co-existed with massive sauropods, such as the *Apatosaurus* and *Diplodocus*, as well as the meat-eating *Allosaurus*. During Paleozoic time, Montana's climate was warm, humid, and possibly densely forested. With its dexterous feet, legs, and tail, *Ptilodus* was a good climber with a well-developed sense of smell. Teeth recovered in the quarries indicate that it was herbivorous. Other fossils found by Douglass and Silberling include a primitive species of ungulate called *Phenacodus*, and a primate-like animal called a *Plesiadapis*, all of which co-existed with the *Ptilodus* and were preyed upon by *Creodonts*, the dominant carnivorous animals of the time. Albert Silberling's excavation of thousands of fossils and his discoveries from quarries in the Harlowton area have greatly contributed to scientists' knowledge about life in the Paleozoic Era.

Albert Silberling in the Redrock Mountain area near Harlowton, 1949.

Photo courtesy of Jackie Silberling



Crazy Mountains, photograph by Kristi Hager.



Ptilodus and Miocene predator called a Creodont. Illustration by Norman Paul Dwyer.

Geo-Facts:

- The Crazy Mountains are an intrusion of igneous rocks that pushed their way up through older sedimentary rocks about fifty million years ago. The rugged southern peaks of the range were sculpted by glaciers.
- Earl Douglass and Albert Silberling collected 178 specimens from one quarry that included 23 species of mammals that were no larger than a modern rat.
- Paleocene means “early dawn of the recent” in Greek. The Paleocene Epoch immediately followed the mass extinction event at the end of the Cretaceous Era.

Geo-Activity:

- Think about the types of mammals, landscape and climate described in the marker that once existed in the area and compare them to places and animals you see today. Look at the picture of *Ptilodus*, is there a similar animal where you live?