Skeletons of the Flying Reptile *Pteranodon* Added to the Bismarck Airport Fossil Exhibit

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North Dakota's fossil record has provided us with great insight into the community of animals that lived in this state during the Late Cretaceous about 66 million years ago. At that time, most of western North Dakota was a delta, and to the east oceanic conditions still persisted. The climate was warm and humid and forests covered much of the delta. This delta provided habitats for some of the most unusual and interesting animals that have ever lived in the state, including dinosaurs. Remains of about 14 kinds of dinosaurs have been recovered from the Hell Creek Formation in North Dakota including *Triceratops*, *Edmontosaurus* (duck-billed dinosaur), and *Tyrannosaurus rex*. Crocodiles, lizards, turtles, fish, birds, mammals, and many other animals lived with the dinosaurs. Many species of invertebrate animals, fish, mosasaurs (huge marine lizards), and seabirds inhabited the ocean east of the delta. Dinosaurs were the dominant life form on land and mosasaurs and sharks dominated the marine waters.

But what about the animals that spent much of their lives in the sky? Bird fossils are uncommon because their bones are generally hollow and thin and are not often preserved. We do know that birds lived during the Late Cretaceous in North Dakota, but we know very little about them. The largest flying animals that lived at this time were pterosaurs, flying reptiles. Pterosaurs were not dinosaurs but were their contemporaries and dominated the air as dinosaurs did the land. More than two hundred million years ago during the Triassic Period, pterosaurs were the first vertebrate animals to develop the capacity of sustained flight with control over steering and direction. The wing membrane in pterosaurs was stretched over a single extremely long finger referred to as the "wing finger." The other three fingers terminated in powerful, sharp, curved claws used for climbing rock ledges or perhaps trees. Pterosaur bodies were lightly built, and their wing bones, like those of birds, were hollow with extremely thin walls. Because

of this, pterosaur fossils are also scarce. They were probably fairly helpless on land, but they had webbed feet and likely could swim. It is believed that at least some pterosaurs had hair or fur and were probably warm-blooded. They ranged worldwide and, like dinosaurs and mosasaurs, became extinct at the end of the Cretaceous about 65 million years ago.

Like dinosaurs, there were many species of pterosaurs. Fossils of one of these pterosaurs, *Pteranodon*, have been recovered from the Hell Creek Formation. *Pteranodon* ("toothless flyer") was gigantic. Though its body was quite small, weighing only about thirty-five pounds (15 kg), its wingspan was more than twenty feet (6 m). *Pteranodon* was a powerful flyer who also could glide and soar effortlessly on rising air thermals over great distances and for long periods of time. It had a long, thin bone crest at the back of its head that was possibly used for sexual display or functioned as a stabilizer for its long head during flight. The crest could also have served as a counterweight to the animal's long beak. Unlike many pterosaurs, *Pteranodon* did not have teeth. A fish eater, it lived along the coast of the ocean that covered eastern North Dakota at the end of the Cretaceous Period. Although not closely related to birds, it led a life style similar to that of the modern-day albatross, which has a ten-foot (3 m) wingspan and spends most of its life soaring over marine waters preying on fish.

In 2009, we created a fossil exhibit for display at the Bismarck Airport (Hoganson, 2009). That display features a *Triceratops* skull and other fossils recovered from the Little Missouri National Grassland in North Dakota, which is administered by the USDA Forest Service-Dakota Prairie Grasslands. The Dakota Prairie Grasslands administrators were enthusiastic about exhibiting fossils found on the Little Missouri National Grassland and provided funding to construct the display case and the graphics. While we were installing the exhibit, Greg Haug, manager of the Bismarck Airport, and I discussed the possibility of suspending casts of *Pteranodon* from the ceiling over the display case to enhance the exhibit. We decided that adding flying reptiles would be an exciting addition. For those of you who have not been to the Bismarck Airport it is a beautiful facility and the 40-foot-high ceiling is painted as a blue sky with clouds. When Greg and others designed the building they installed hooks in the ceiling with the thought that display objects could be suspended. I approached the USDA Forest Service-Dakota Prairie Grasslands about the plan. Again, they endorsed the idea and provided funds for three skeletal casts of *Pteranodon* for the display. The exhibit was completed in May of this year.

Reference

Hoganson, J.W., 2009, *Triceratops* skull and other fossils from the Little Missouri National Grassland exhibited at the Bismarck Airport: Geo News, v. 36, no. 2, p. 22.

Mammals of North Dakota by Robert Seabloom published by the North Dakota Institute for Regional Studies

The Mammals of North Dakota is the first comprehensive account of North Dakota mammals since Vernon Bailey's 1926 compilation. What better person to write this book than Robert Seabloom, internationally respected mammalogist and Professor Emeritus of Biology at the University of North Dakota. The book provides detailed accounts and colored images of the 86 mammal species known in the state. Detailed descriptions, habitat preferences, ecology, behavior, common names, and known Native American names are given for each. The mammalian biogeography of North Dakota and principal habitats of the state are dealt with in introductory chapters. The principal habitats section was written by William F. Jensen, biologist with the North Dakota Game and Fish Department. John Hoganson, NDGS paleontologist, contributed an introductory chapter about the mammalian paleofaunas of North Dakota.