

Fossils In North Dakota

FIND is a newsletter dedicated to helping young readers (in age or spirit) express their love of fossils and paleontology, and to help them learn more about the world under their feet. Each issue will be broken up into sections including Feature Fossils, Travel Destinations, Reader Art, Ask Mr. Lizard, and more!

Summer 2012, No. 5

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Next Issue: September 2012

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Feature Fossil: *Edmontosaurus*

Edmontosaurus, or "lizard from Edmonton," is a very common dinosaur found at the end of the Age of Dinosaurs, during the Cretaceous Period 65-million years ago. They lived at the same time as *Tyrannosaurus* and *Triceratops*. It is commonly known as a duck-billed dinosaur, due to the wide flat appearance of its mouth. They are from a larger group of dinosaurs called **hadrosaurs** (Greek for "bulky lizards"). Some hadrosaurs had crests on their heads, while others like *Edmontosaurus* did not. These animals were **herbivores** (plant-eaters), with a whole battery of teeth used for grinding leaves. They constantly replaced them as they fell out, but had between 800 and 1200 teeth in their mouths at one time. No wonder they are lovingly called the "Cretaceous cow" – they were plant eating machines!

Edmontosaurus had wide hind feet with three toes, and narrow hands with four fingers. The first three fingers were stuck together in a mitten-like shape, with a moveable pinky. While they may have looked unblanced at first, these animals could wander around on all four legs, or run quickly on just their hind-legs. Their tails were very stiff, thanks to a network of **tendons** (tissue that connects bone-to-muscle) that helped give support. Nose to tail, they could reach over 40 feet long – the same size as *Tyrannosaurus*!

Even though duck-billed dinosaur fossils are common, they have been found with something very rare: fossilized skin! To see an amazing example of this, come visit "Dakota the Dinomummy" at the Heritage Center in Bismarck, ND. The tail and arm of the dinosaur are currently on exhibit, and show a beautiful honey-comb pattern of scales, and wrinkles.



Ask Mr. Lizard...

How did the *T-rex* get his food if he was not able to use his arms?

Tyrannosaurus had a massive head, with jaws and teeth that could crush bone. It also had very powerful hind legs. Even if it couldn't get its arms around another dinosaur, it could still body-slam them to push them off balance, or grab hold with its mouth. One bite was enough to rip through muscle and crush bone – many fossils of plant-eating dinosaurs like *Edmontosaurus* and *Triceratops* have been found with *T. rex* battle damage!

Why did things like skin and dino-poop fossilize?

Most of the time hard parts (bones, shell, teeth, etc.) turn to rock, but sometimes soft things can too. It takes a special circumstance for it to happen. In the case of skin or coprolites (poop), they have to be buried quickly, and dry out. If they stay moist, then bacteria can come in and dissolve away the soft parts. If they're not buried, then predators can tear apart the softer skin and muscle.

V.I.P. (Very Important Paleontologist): Jeff Person, North Dakota Geological Survey, Bismarck, ND

How old were you when decided to be a paleontologist?

JP: I was a senior in High School when I decided to become a paleontologist. 17 I think.

Was there an event or experience that triggered your decision?

JP: I helped to put together an exhibit of a large mastodon skeleton.

What plants or animals are / were your main study focus?

JP: My initial focus was on mammalian carnivores. However, lately I've become interested in the history of life of North Dakota including plants, invertebrates and vertebrates.

Do you have a favorite fossil animal?

JP: I have many. I tend to gravitate towards the bizarre as my "favorites." An example might be an animal called *Epigaulus* which was a horned rodent, or *Macrauchenia* (a South American animal with a short proboscis or trunk), *Helicoprion* is another bizarre animal. *Helicoprion* is a shark with a spiraled lower jaw. I could go on and on, there are lots of bizarre animals.

What do you enjoy most about research / lab work?

JP: I get the most satisfaction knowing when I discover or see something that I am likely the first person to see or discover that. That thrill of being "first" is slightly addicting. It drives me to do more.

Where in the world have you traveled looking for fossils?

JP: I have explored nearly every state west of the Mississippi River looking for fossils, I have also been to Canada and Australia looking for fossils. I have been very fortunate to see many beautiful places while doing fieldwork.

What do you like most about field work?

JP: I like being out in the wind and the weather. I like being away from the phone and from e-mail. It is very easy for me to imagine I am the only person for miles around when I'm out wandering the badlands of North Dakota.

What has been your most exciting discovery so far?

JP: I discovered a brand new animal to science while doing field work in Australia. It pushed the appearance and evolution of this group backwards in time about 10 million years. The fossil I found represents the earliest known genus of this group. The animal was a relative of the modern Cuscus (a kind of possum), living in Australia. We named our new species *Eocuscus sarastamppi*.

What advice would you give to aspiring paleontologists?

JP: When you first start out in your college education, volunteer at the local museum, lab, or whatever and make your face known. Do the things that nobody else wants to do and those things usually lead to other opportunities.

Just Imagine...

The herd of *Edmontosaurus* had migrated to their yearly nesting ground. Each adult female was busy gathering plants and sticks to place around their claimed territories. The mothers were too large to sit on the eggs, but they could use the rotting vegetation to help warm the nest. The yearlings and juveniles scampered about, risking the occasional nip if they wandered too close to a tended nest. It was near hatching time; each mound of earth was filled with over a dozen of the smooth rounded eggs. A few always went missing due to small stealthy predators, but not enough to hurt the herd.

A rusting in the trees alerted the *Edmontosaurus* sentries, and they watched intently for more movement. The wind shifted slightly, bringing a telltale smell of rotten meat wafting on the breeze. The sentries began honking and bleating, alerting the rest of the herd to a possible threat. Sure enough, a lone juvenile *Tyrannosaurus* came stalking out through the branches. It scanned the herd, looking for an easy meal. It was used to these types of plant eaters, which generally fled before it in terror, leaving the slow or weak behind. Unfortunately, the nesting hadrosaurs were standing their ground, unwilling to give up their eggs. The herd picked up the call, and a massive wave of bleating, honking, stomping, and tail-slapping erupted through the area. This aggressive response was not what the *Tyrannosaurus* was expecting, and it wavered unsure. Finally, it turned back to the trees. It would have to find an easy snack somewhere else.