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!

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Editor: Becky Barnes
North Dakota Geological Survey
600 East Boulevard
Bismarck, ND 58505

becbarnes@nd.gov

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Please e-mail us if you wish to receive the electronic version of FIND, or view past issues at:
https://www.dmr.nd.gov/ndfossil/kids/

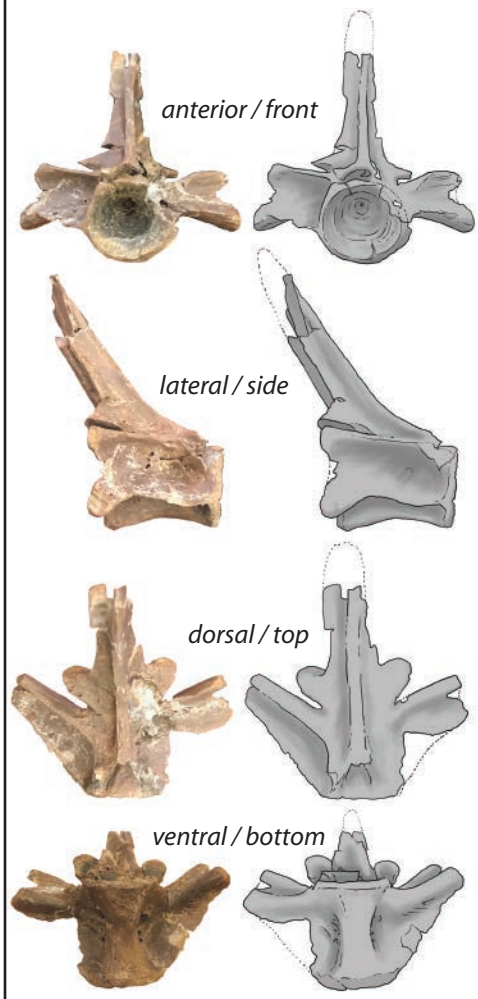
Feature Fossil: *Piceoerpeton*

Piceoerpeton is a favorite fossil of mine. Maybe because it's a salamander of unusual size. Maybe it's the intricate struts and supports in the bone. Perhaps because it's rare and delicate. Whatever the reason, they were certainly awe-inspiring creatures. *Piceoerpeton* were prehistoric giant salamanders from the Paleocene (~55-65 million years ago), which look similar to the giant salamanders still alive today. Yes, we have giant salamanders *alive today*. You may be more familiar with small salamanders you find in the backyard, or near rivers, such as the tiger salamander or mudpuppy (both can be found in North Dakota).

The largest salamanders we get in the United States are *Cryptobranchus* which can grow up to 29 inches long, with tail. They are primarily found in fast moving water with a rocky bottom. While they do have lungs they are not well developed, so they also rely on heavily folded skin for breathing and oxygen exchange. The fast-moving water allows for more oxygen to pass over their skin, enabling them to breathe more easily. Because of their heavily folded and wrinkled skin, which also secretes mucous to ward off predators, they are locally known as: snot otters, lasagna lizards, mud dogs, and hellbenders.

The largest salamander living today is the Chinese giant salamander, *Andrias*, which can reach a whopping 5 feet in length, including tail. Our *Pieceoerpeton* was somewhere between these two, perhaps closer to 36 inches long. We have found numerous vertebrae at our Medora public fossil dig site – some small (maybe from a 12" long animal) to whoppers from critters up to 3 feet long.

Art by Jenny Wiersma



At left are four views of one large vertebra. Sometimes a photo is hard to "read," so we make simplified line drawings or shadings of a fossil, to help other scientists and viewers better understand what they are looking at. Rather than fill in a bunch of plaster, or try to rebuild the original fossil, the illustrator may also add in missing pieces with a dotted line, to give an idea of where that something should be, without damaging the fossil.

Piceoerpeton skulls are very flat, and their teeth barely poke up into the mouth. With how their bones are arranged, their hunting style may have been a little like a vacuum cleaner. As they opened their mouth rapidly, it could suck in any little worms, grubs, or fish. Their jaw muscles were strong enough that afterwards, they could slam their jaws back together again, crushing any invertebrate exoskeleton that was pesky enough to be in the way, thus offering our salamander a tasty snack.

Do you read the FIND?

We're up to 31 issues of the FIND now - which is awesome! However, we don't have a great way to track our readers. We want to know if we should keep writing more issues, or if we should devote our time to other projects. If you read the FIND, please let us know! Drop us an e-mail, or a shout on Facebook - should we continue?

V.I.P (Very Important Participant) Jack Puryear, North Carolina

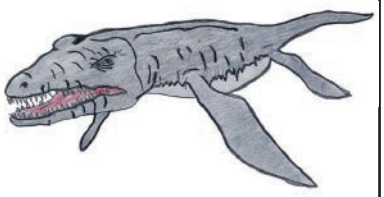
Jack, his sister Maddy, and parents attended our 2018 Pembina Gorge public fossil dig. These avid diggers came all the way from North Carolina! Jack and Maddy are so interested in fossils and prehistoric life, they have a Facebook page dedicated to it. Go check out "The Adventures of Jurassic Jack"

How long have you been interested in fossils

Probably since preschool.

Do you have a favorite prehistoric plant or animal?

Dilophosaurus.



What do you want to do when you grow up?

Be a paleontologist.

Have you ever been on a fossil dig, before the Pembina Gorge dig?

No.

What did you think of the Pembina dig?

I thought it was amazing. My favorite part was going through the different rocks and stuff, to see what was inside. Like, is there something in here? There is! Is there something in here? No there isn't.

How old / what grade are you in?

I am 12 years old, and I am in 7th grade.

Dig Supporters & NDGS Paleo Pals

When the NDGS Paleontology program went international after the 2017 field season, thanks to the Today Show and New York Times, the 2018 field season pretty much exploded. We doubled the number of slots available, and people were still clamoring to attend. First off, that's very encouraging and flattering. Second, in order to keep up with that pace, we had to do something to get our digs to be budget neutral. It is very important to us to keep the costs as low as possible for the public attendees, since we want to keep this as educational as possible, and we're not a commercial outfit. However – everything seems to cost money. Supplies, gas, hotels, tools, porta-potties, souvenirs, road repairs, etc.

We turned to our diggers for inspiration – many of whom suggested we start up a "friends" program of sorts, where some people donate to the program, to keep the costs down for everyone. We crunched some numbers, wrote up some guidelines, and launched a 2-front campaign. The first of which was the NDGS Paleo Pals. This was a direct "friends" group, which would receive different rewards when certain donation levels were hit. ***Eumys*** level get a certificate and a pin. ***Borealosuchus*** get a 1-hour video chat with one of our paleontologists, a certificate, and a pin. ***Smilodon*** get a tour, plus prior rewards. ***Mosasaurus*** will receive a fossil cast, plus prior rewards. ***Tyrannosaurus*** can schedule a private fossil cleaning session, plus prior rewards. All money donated as a Paleo Pal would go directly into our Paleontology Fund, which we use for summer digs, labwork, and exhibits.

Since the digs were in such high demand, we also launched a sister-group, the NDGS Dig Supporters. This group would receive all of the same benefits of the Paleo Pals (and automatically become a Paleo Pal of corresponding level), in addition to receiving early registration dig slots. We understood we couldn't give away all the spots, or else no one new could ever dig with us. Thus, we limited the number of "early registration" spots to about 1/4 of the available spaces, leaving the rest for newcomers.

The friends groups, along with online registration, will hopefully make 2019 and future years run smooth. We appreciate everyone's patience and input as we try out this new tactic! Dig information can be found here:

https://www.dmr.nd.gov/ndfossil/digs/

Registration begins Saturday February 2nd, 10am Central.

Ask Mr. Lizard

What shapes the changing public image of dinosaurs more: cultural influences or new technology?
-Jenny Wiersma

I would say both have a little to do with it. For dinosaurs to be in the public eye, they have to be cool, relevant, and easily accessible. Fads come and go, and dinosaurs fit that description too. In the early 1800s when they were new to the public, they were all the rage. Great lumbering lizards filled the imagination. Over time they fell out of favor, and went the way of the dinosaur! Then the 1970s dinosaur renaissance hit, and once again they spiked up in public interest. This peak wasn't necessarily from new technology, but it was from new research into anatomy. Hot-blooded? Cold-blooded? Feathered?

After this peak things calmed down a little, but there was still a hum of activity. That hum turned into a roar with the movie Jurassic Park in 1993. Dinosaurs were shoved out into the public eye as living, breathing, monstrous creatures – and we've seen active interest since then with new movies and TV shows for kids (Jurassic Fight Club, Dino Dan / Dana, Dinosaur Train, Land Before Time, etc.). Technology in the form of statistics, morphometrics, scanning electron microscopes, etc., have certainly changed the look of those animals. Their postures have changed, feathers and spikes have been added, even color at time. So cultural influences are keeping dinosaurs in the spotlight, while technology keeps them relevant and up-to-date.

What is the smallest dinosaur ever found?
- Jason Gould

Technically the smallest dinosaur would be a hummingbird! However, one of the smallest extinct dinosaurs would be *Parvicursor*, a tiny animal from the Late Cretaceous of Mongolia. It would have been about chicken size, with a snout-to-tail length of ~15 inches. They come from a group of dinosaurs called alvarezsaurs, which include the better-known *Mononykus*. It had short, stubby arms with one stout claw and reduced fingers, making it look like one spike on each arm. They were probably insect eaters, and could have used their claw to dig through ant hills or termite mounds.

How angry are you against the whole "Jurassic Park" thing? -René Wagner

This relates to the first question – I (personally) love the Jurassic Park series. To me, they're modern monster movies. I'm happy with how they get people interested in science (not just dinosaurs), and how today it's not looked down on to have an interest in dinosaurs. It was a little more odd for a girl to be interested in dinosaurs 30 years ago. We can use the movies to our advantage – there are always families coming in to learn more about dinosaurs or other prehistoric creatures. We can use that interaction to better educate the public on the real science behind the movies, and hopefully they leave with a new found hunger for learning.

More shots of our VIP digging at the Pembina Gorge public fossil dig. Great job!