

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!

Fall 2016, No. 22

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Next Issue: December 2016

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<https://www.dmr.nd.gov/ndfossil/kids/>



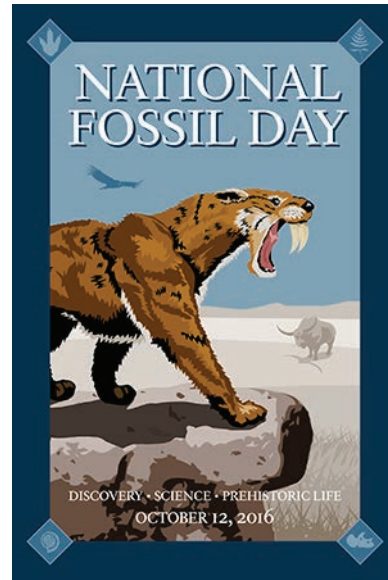
Feature Fossil: *Ophiomorpha*

Ophiomorpha is an interesting fossil. It is not a plant. It is not an animal. It is something called an **ichnofossil**, or trace fossil – something left over from a once living organism. Trace fossils are things like footprints, chew marks on leaves, and in this case, a shrimp burrow! The closest living relative that makes a similar burrow is a mud shrimp called *Callinassa*. These are small crustaceans that live in the **benthic zone** of seas and oceans – stretching from the shore through the bottom of the seafloor. These shrimp are **decapods** (ten legs), with one front pincer much larger than the other. They look similar to a pale translucent lobster, but only reach about 5cm in length – so pretty small in comparison!

The shrimp dig burrows through the silty sediment, piling the excess debris outside the tunnels. Some of the fossil burrows look pebbled on the surface, while others do not. The pebbles are actually fecal pellets (tiny balls of poo) squished in to the lining of the walls, used to help strengthen the burrow. Wherever you find *Ophiomorpha*, there had to have been a lot of water. In North Dakota, we find the trace fossils in Cretaceous aged rock (67 million years old), where the Western Interior Seaway moved its shoreline back and forth. We also find it in Paleocene aged rock (60 million years old), when the Cannonball Sea last inhabited the state.



National Fossil Day 2016



This year National Fossil Day will be held on October 12th. The NDGS and the State Historical Society will be expanding their participation a little from last year. There will be a fossil-rock-artifact identification table, a prehistoric fishing trip, coloring, and other activities around the Heritage Center. Since it will be so close to Halloween, the public is also encouraged to come in costume! There may be

a special "treat" for those who do.

If you wish to show off your art skills, there will also be an **art contest!** For complete guides and rules, please visit:

https://www.dmr.nd.gov/ndfossil/fossil_day/FossilDayActivities.asp

The short version: the contest is open to everyone in North Dakota. The theme is your "favorite fossil from North Dakota." Entries will be broken into age categories, and winners picked from each division. Winners will be posted online, and will be on display at the Heritage Center for a year. Entries must be 2D (two dimensional), but you may use any medium (photography, drawing, painting, digital, etc.). They may **not** be larger than 8.5" tall, and 11" wide. Deadline is Friday, October 7th, 2016.

Rock Show

The Central Dakota Gem & Mineral Society is holding their 43rd annual Rock Show this October! Education day (school groups) are welcome to come Friday, Oct. 7th, from 9-5pm. Saturday, Oct. 8th is open to the public, from 9-5pm. Come see rocks that glow, fossils, gems & crystals, lapidary work, wire-wrapping, and more. Vote on your favorite exhibit case. Take home a grab-bag full of rocks and goodies. Help the CDG&MS celebrate 50 years as a club! Visit ndrockclub.org for more information.



Public Dig Report

It has been a whirlwind summer of digging. We're done with our Public Fossil Digs, but are still heading out to do more fieldwork for research – some of it because of what was found this year. We lost very little digging time due to rain, although the ticks and skeeters were out in force.

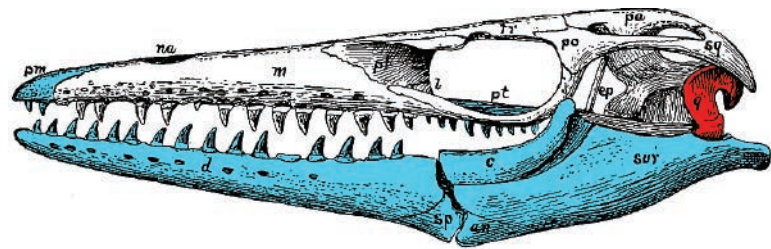
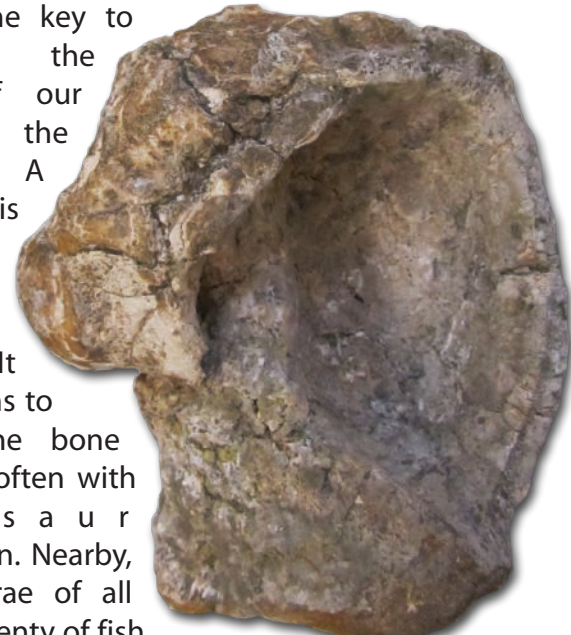
Dickinson Area Dig: Throughout the week, we found a standard assortment of creatures. Three-toed *Mesohippus* teeth, sheep-like oreodont bits, a plethora of hornless rhino *Subhyracodon*, and a grand old tortoise *Stylemys* that was found last year, and finally pulled out this year. On top of those, we had two gems. The first was a high concentration of bird bones found by Senior Paleontologist Clint Boyd. Birds are very fragile, so finding ANY fossil of them, let alone what looks to be a partial skeleton, is awesome. The second was a deposit of crocodilian material, including **osteoderms** (skin armor), vertebrae, and toes.



Whiskey Creek Dig: Even though this dig was shortened to three days, we had plenty of material to haul out. Crocodiles are the big thing out here – so finding osteoderms, while cool, isn't a cause for celebration. One crocodile can have hundreds of osteoderms – however, they only have two of each limb bone. This year, we found some really nice looking limb bones and claws. This was a very hot, very windy dig this year.

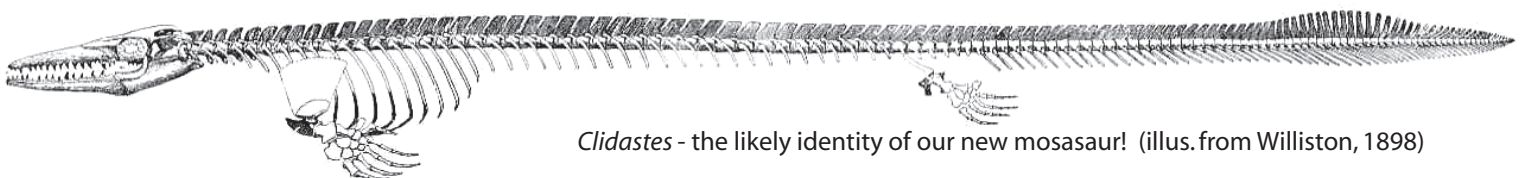
Medora Dig: Medora started out pretty normal – poop, poop, poop! Fish and crocodile coprolites everywhere. Pulled a few nice looking fish skull bones, what could turn out to be a nice gar pike jaw, and a large section of turtle shell. The rarest find of the dig was a bone that could be from a giant salamander skull. Not just a run-of-the-mill salamander, but a three-foot-long amphibian.

Pembina Gorge Dig: We continued to remove the mosasaur skull that was found last year, pulling three more bones from the hillside. One of which is the key to discovering the identity of our creature: the **quadrate**. A quadrate is part of the lower-jaw complex in the skull. It also happens to be the one bone used most often with mosasaur identification. Nearby, fish vertebrae of all sizes, and plenty of fish scales, were found.



The bone highlighted in red above is a quadrate (albeit from the opposite side), found in the back of the skull of mosasaurs, as well as other lizards. The quadrate in mammals has become the incus (anvil) bone in the middle ear.

The bones highlighted in blue represent known bones that were found in 2015. The fossil is currently being worked on, so the farther in to the **jacket** (protective plaster around the fossil), the more bones we find. We are hopeful that in 2017, we'll find even more of the skull.



Clidastes - the likely identity of our new mosasaur! (illus. from Williston, 1898)