

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



Feature Fossil: Dakota the Dinomummy

Our Fossil Feature in issue 5, way back in June of 2012, was *Edmontosaurus*. This time around we would like to focus on a specific individual *edmontosaurus*, "Dakota the Dinomummy." At the time of its death, this animal was a little over half-grown. Nose-to-tail it would have measured around 23-25 feet, but what really makes it impressive is the large amount of fossilized skin that is preserved along with the bones.

When Becky Barnes was first hired with the NDGS, she had finished working with skeletons of *Edmontosaurus*. Her first task with the paleontology program was to work on the skin of that same kind of dinosaur. For the next five years, she teamed up with Amanda Person, Amy Sakariassen, and Marron Bingle-Davis to carefully clean off as much of the skin as time allowed. With all of the pneumatic tools in use, the lab sounded like a hive of bees. Everyone took care to protect their hearing however, and either had earplugs in, or headphones for music and audiobooks.

In 2013 the whole specimen went on display. This



Becky Barnes
in 2008.



Left to right: Amanda Person, Amy Sakariassen, and Marron Bingle-Davis work on the "body block."

consisted of the 8000lb "body block," the 1300lb "tail block," the 200lb arm, a 75lb foot, and another small chunk of the tail. It is large, it is impressive... and it is also very difficult for visitors to decipher and understand.

We now have the chance to make it a little easier for people to figure out. In 2020, we will be unveiling a new and improved exhibit. With advances in modern technology such as 3D scanning and printing we will be able to scan a section of the tail, and print it, allowing visitors to get as close to petting a dinosaur as we can! While it would be amazing to let people touch the real thing, over time the oil from hundreds of curious hands would begin to discolor the fossil, and attract dirt. So preserving and protecting the fossil, while getting people to interact with it, can be a tricky balancing act.

We've already said Dakota is special because it has fossilized skin – but do you know how special? Very! Until recently, Dakota was only one of about 6 "dinomummies" in the world. Part of that is because finding conditions that favor preserving skin (rapid burial, **desiccation** (drying out), escaping scavenging, etc.) can be difficult. Another part is that paleontologists may not have known what to look for, and because it wasn't expected, skin that may have been preserved was chiseled away to show a beautiful skeleton.

With more skin being found, more people know what to look for and take their time cleaning up a fossil specimen, which can in turn lead to yet more skin. It's an ever growing cycle, and very exciting because each new creature found with patches of skin helps artists and scientists more accurately portray those creatures to people. Ready for some detailed skin photos? Well turn the page, and let's look at some of those cool soft-tissue features that Dakota has...

Tail

The tail was everyone's favorite chunk of rock to work on. It was large, flat, and has interesting scales. It has larger honey-comb or hexagonal shaped scales towards the distal (tip) end, and smaller scales closer to the body. Skin is not as predictable as bone is, and we found that where the scales were smaller we could run into fold and wrinkles. The ventral (belly-side) of the tail, closest to the body, has an almost quilted-look, with collagen (connective tissue) fibers scrunching up the dried-out skin. The tail also has a "frill" running down the dorsal (top) edge, made of much larger square scales.



Above: pencil-eraser-sized scales on the tail. Below: 2" wide frill scales.



Arm

The arm is a very dynamic piece of the puzzle. It has large dime-sized scales on the back of the forearm (where it would not bend), and tiny delicate scales filled with wrinkles and folds near the wrist, elbow, and palm of the hand (where it would bend and flex). This is very similar to what we can see in an emu foot.



Above: back of the arm, dime-sized scales. Below: towards the wrist, full of tiny scales and wrinkles.



Below: more wrinkles and tiny scales near the elbow.



More scales on the next page!

Keep watching us on social media @NDGSPaleo for an announcement this spring about some spooooooky fun we'll be having in October. Full details will be in our Summer (June 2019) FIND.



Calf

The lower leg initially surprised us, but we soon made a game out of it. There were patches of larger scales, surrounded by small scales and a quilt-looking square, repeated all over. We began to guess where the next patch of big scales would be, and see if we were right!



Hip-and-Back

The scales on the hip and back were either not preserved, or were chiseled away before the specimen was brought to us for preparation. Either way – they're not there. Instead we have a clear view of the spinous processes (the little bone-bumps you can feel on the back of your neck), and a lattice-work (criss-cross) of ossified tendons. Tendons in us are connective tissue structures that connect bone-to-muscle, and act as a pulley-system. Look at your ankle, and find the big tendon above your heel – that is our Achilles tendon. Many dinosaurs had a network of tendons running up and down their backbones to help support their weight, and in the case of *Edmontosaurus*, make their tail more like a battering ram than the flexible tail a cat or a dog would have.



Foot

Like the arm, the foot has large and small scales, depending on movement. The fossil foot of Dakota did answer a big question with *Edmontosaurus*: did they have webbed feet for swimming? The answer: no. They had large weight distributing pads on their feet, like a camel has for walking on sand. Each toe ended in a large flat nail, rather than a sharpened claw. It looks kind of like a horse-hoof on the end of each toe. You can even see where



Above: middle and pinky-toe showing nails, scales, and cuticle where they meet.

the cuticle (where the scales stop and the nail begins) is.

Head

We don't know! There is no head or neck to this animal. What happened to it? We don't know that either. It's just one of those mysteries.

2019 Public Fossil Dig Update

As of this newsletter the 2019 fossil digs are about 92% full. The Paleo Pals / Dig Supporter groups seem to have worked well, much to our delight. There are still a few spots available for Medora, Dickinson, and Pembina. We switched signup to online registration, so were able to track and watch how full (and how fast) things happened. The Bismarck dig was the first to fill - within 8 minutes! Crazy! Interested in one of the last spots? You can sign up here: <https://2019ndgspaleodigs.eventbrite.com/>

Fun Stuff In-The-Works

We have just acquired a 3D scanner-and-printer! We are getting used to the programs right now (there is a bit of a learning curve...), but will have more to report on in future issues.

We are now also doing the occasional streaming through [Twitch.tv/ndgspaleo](https://www.twitch.tv/ndgspaleo) - watch timelapses of dinomummy skin cleaning, molding and casting, interviews, talks, and more. This will also be used more in the future. If the museum is too far for your school to travel, but you still would like a tour / talk, we can always work with you through Skype via our webcams.