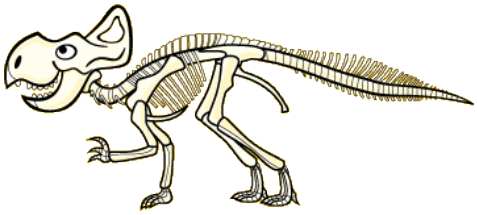
# Face to Fossil

*This text is provided courtesy of OLogy, the American Museum of Natural History's website for kids.*

## Hi, paleo pals. I'm Deena Soris.

My guest today is a fossil of a *Protoceratops*. This dashing dino was dug up in the Gobi Desert in Mongolia during the 1920s. Paleontologists named this kind of dinosaur *Protoceratops andrewsi* (pro-toh-SER-uh-tops an-DROO-zee) in honor of the last name of the guy who led the expeditions that discovered it — Roy Chapman Andrews. Please slap your bony hands together for my very close fossil friend..."Proto Andy!"



PROTO ANDY: Thanks. It's great to see you again, Deena.

**What Were You like When You Were Alive?**

DEENA: You look fabulous. How old are you?

PROTO ANDY: I'm about 80 -

DEENA: (interrupting) 80? That's not very old for a dinosaur. My grandmother is 95, so what's the big —

PROTO ANDY: (interrupting back) I wasn't finished. I'm 80 million years old. But I feel like I'm only 10 million. It's all in your attitude, Deena.

DEENA: What did you look like when you were alive?

PROTO ANDY: I've heard the scientists say that 80 million years ago I used to be the size of a very large pig and might have weighed as much as 500 pounds.

DEENA: Were you fast on your feet?

PROTO ANDY: No one knows. Paleontologists haven't found any *Protoceratops* footprints yet. However, *Protoceratops* were a lot slower than some carnivores that ate us for lunch because we have such short legs.

DEENA: How do scientists guess an extinct dinosaur's speed?

PROTO ANDY: Sometimes scientists can estimate a dinosaur's speed by comparing its fossilized legs with the legs of similar animals that are alive and running.

**How Did You Become a Fossil?**

DEENA: So what happened? One day you're happily munching away on thick, tough plants, and the next you're history?

PROTO ANDY: Some paleontologists think one of those nasty Gobi "sand avalanches" got me. Heavy rainstorms can cause the sand to flow like a mud slide. It could have been worse. Okay, I was killed. That's the bad news. The good news is that the sand buried me before other animals could devour me. And now, I help build scientific knowledge!

DEENA: How did you go from being a "Gobi sandwich" to a fossil?

PROTO ANDY: After I was buried, my body decomposed very slowly underground.

DEENA: Yuck!

PROTO ANDY: Happens to the best of us. Eventually, all the fleshy parts of my body were gone. Over millions of years, water in the nearby rocks surrounded my bones. Some of the minerals in the water replaced parts of my bones. Then I became a fossil. I was lucky that my bones were not distorted by all the heat and pressure.

DEENA: Your bones were underground for 80 million years. How did the paleontologists find you?

PROTO ANDY: They just ran around the Gobi shouting, "Here, Proto-Proto! Here, Proto-Proto!"...Just kidding.

DEENA: Come on, I'm serious. What happened?

PROTO ANDY: In the Gobi, the paleontologists know to look for fossils in sandstone, a kind of sedimentary rock. Because of erosion — forces like rain, hail, and wind — some of my bones stuck out of the ground a bit. Scientists knew that once they found my exposed foot, the chances were good that the rest of me was buried not far away.

**How Did You Get to New York City?**

DEENA: How did they get you to New York City?

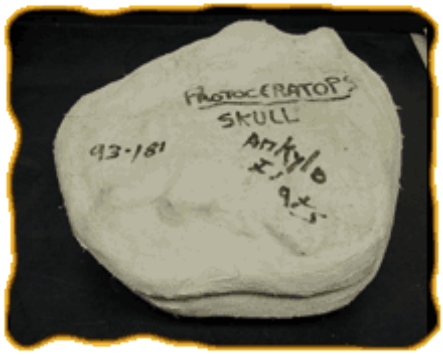
PROTO ANDY: First they excavated me. Of course, I was buried, so I couldn't see what was going on, but they took a lot of pictures.

My skeleton is quite fragile, and the paleontologists didn't want to damage me. So, they put glue on me and cleared away the sand near me using picks, chisels, dental tools, and some brushes. It didn't hurt a bit.

DEENA: Did they remove you from rocks in the desert?

PROTO ANDY: Nah, that would have taken too much time. Plus, they could have damaged my lovely bones. What they did instead was use a large knife to carve out a large chunk of rock around my skeleton. Then they put a jacket on me.

DEENA: Were you cold?




PROTO ANDY: No, a different kind of jacket. In paleontology, a "jacket" is the name for the hard stuff they wrapped around me to keep me safe. They put toilet paper over me to protect my bones. Then, they wrapped me up with bandages and plaster. I looked like a mummy.

DEENA: Then, what happened?

PROTO ANDY: They put a number on my plaster jacket, wrote notes in their field book, and then put me in a large box. Next, they stuck me on a truck, then a train, and finally a boat. During the trip, my fossilized bones were packed with sawdust and straw to prevent any damage. They took such good care of me!

DEENA: That was in the 1920s. Is the same method used these days?

PROTO ANDY: Pretty much. Although some of the very special fossils get sent to New York by airplane rather than by boat.

**What Do You Do at the Museum?**

DEENA: Once you got to the museum, what happened?

PROTO ANDY: People at the museum called "preparators" removed my plaster jacket and cleared away all the rock and sand using dental tools, soft tongue depressors, and a little vacuum. Next, latex rubber molds of my bones were created so that copies could be made.

DEENA: Once you were all cleaned and ready, did they then put you in one of the dinosaur halls of the museum?

PROTO ANDY: Nope. They stuck me on a shelf in the basement, where I've lived since the 1920s. I used to think, "You drag my bones all the way from Mongolia, and now you're just going to leave me on a shelf? My public awaits me!" Then I learned that over 95% of fossils are never displayed in the exhibition halls. Most fossils are used for research. So, I'm not a performer, but I guess you could say I'm part of the research team.

DEENA: What do they do with you if you're not in the halls?

PROTO ANDY: Scientists here sometimes take us to their offices for study. Occasionally, a scientific illustrator draws pictures of me for a journal of paleontology.

DEENA: When dinosaurs are put in the exhibition halls, how do the scientists decide what position to put the bones in?

PROTO ANDY: It's never easy. Scientists work together with artists to figure out a position that's probably accurate and fun to look at.

DEENA: I heard that the big *T. rex* skeleton got a makeover a few years ago. Why?

PROTO ANDY: At the American Museum of Natural History, the *Tyrannosaurus rex* fossil used to look like that movie monster Godzilla. Once scientists realized that most dinosaur trackways (footprints) have no "drag marks" from their tails, they realized that dinosaurs probably walked with their tails in the air rather than dragging behind them.

This is what the *T. rex* looks like now.

**What Does the Name *Protoceratops* Mean*?***

DEENA: I have a bone to pick with you...

PROTO ANDY: Ouch!

DEENA: Sorry, just an expression. I'm confused about something. You're a ceratopsian dinosaur, right? Your name means "first horned face." Why don't you have any horns?

PROTO ANDY: Are you blind? Don't you see this glorious bump on my nose? All ceratopsians (seh-rah-TOP-see-inz) have it. Okay, so it's not a big, pointy horn like that ceratopsian superstar, *Triceratops*. Man, that guy was an overachiever.

DEENA: Have you met any other ceratopsian fossils at the museum?

PROTO ANDY: *Triceratops* and I have a distant ceratopsian relative called *Psittacosaurus* (sit-TAK-koh-SAW-ris). It was a no-frill dinosaur. It had a curved beak like us – but no frill. That's the name for the bony "thingee" that sticks out of the back of my skull and over my neck.

DEENA: Is it a thrill to have a frill?

PROTO ANDY: You bet. Paleontologists call it a "display structure." This means that we probably used it to threaten each other by showing it off and to recognize other members of our species.

DEENA: What did you eat during the late Cretaceous period?

PROTO ANDY: Once again, I've stumped the scientists!

DEENA: That's not fair. Paleontologists have some clues about your diet.

PROTO ANDY: Well, okay. They've made some clever deductions. My teeth suggest that I probably was an herbivore [UR-bah-vore]. You know, a plant-eater. I used my teeth to slice the skin of thick, tough plants - but they don't know what kind I ate because they haven't found any plant fossil evidence near me. So, my diet is still a little secret.

**Do You Have Any Secrets to Share?**

DEENA: We're almost out of time. Any secrets you'd like to share with the folks at home?

PROTO ANDY: Here's a shocker. Based on my bones, scientists can't tell if I used to be a dino-guy or a dino-girl.

DEENA: How embarrassing!

PROTO ANDY: Tell me about it. Scientists have found two different types of *Protoceratops* skulls. One has a low face and inclined frill, and the other has a deeper snout with a small horn-like bump above the nose and a more vertical frill. Unfortunately, it's impossible to know for sure which skull is male and which is female.

DEENA: We've come to the end of another edition of *Face-To-Fossil*. Proto Andy, you've been wonderful. This is Deena Soris saying farewell to all my paleo pals out there.

See you next time.

Name: _____ Date: _____

1. What kind of dinosaur is Proto Andy a fossil of?

2. Scientists use most fossils for research. What is one thing scientists have learned or deduced about Protoceratops dinosaurs from the dinosaur's fossils?

3. What is a main idea of this text?