

# The Tiny Dino



After 108 million years buried in Montana a pint-sized cousin of Triceratops comes to the Sam Noble to help paleontologists fill in the blanks of its family tree.

BY JEN TREGARTHEN





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**A** fossilized skull no bigger than a lemon has led researchers one step closer to understanding a 108-million-year-old mystery.

Because of a limited fossil record, paleontologists have struggled for decades to reconstruct the early evolutionary history of Ceratopsians in North America. With a signature frilled skull and beaked nose, Ceratopsia is among the most recognizable and best-known dinosaurs in history.

The skull, named *Aquilops americanus* (“American eagle face”), represents a 3-pound relative of Triceratops, which weighed up to 4,000 times more. A “no frills” Ceratopsian, the new species *Aquilops* also lacks the trademark head shield and facial horns of its distant cousins. It was roughly the size of a small cat and estimated to have been two feet long—another point of contrast with its truck-sized relatives.

For up to 108 million years, this specimen lay buried deep in the red, sandy, clay stone of southern Montana’s Cloverly Formation. It was unearthed during a 1997 expedition of paleontologists from Oklahoma and California, and funded by

the National Geographic Society’s Committee for Research and Exploration. *Aquilops* is now the oldest member of the horned dinosaur lineage named from North America.

*Aquilops* provides important new information on vertebrate history during the latter part of the age of dinosaurs, says Richard Cifelli, curator of paleontology at the Sam Noble Museum of Natural History.

“We were excited that it looked like a skull of a small plant-eating dinosaur, but we assumed that it belonged to a species already known,” says Cifelli, who headed the expedition. “It wasn’t until the skull was freed from rock that we realized we had something new and significant.”

Paleontologist Scott Madsen, a member of the expedition and an accomplished preparator, both discovered and prepared the fossil skull. Madsen spent countless hours painstakingly removing it from hard rock a few sand grains at a time using a specially sharpened carbide needle.

“The ‘aha’ moment came when I uncovered the snout and saw a sharp, hooked bill,” says Madsen. According to Ceratopsia expert Andrew Farke, lead author of a scientific paper describing *Aquilops*, “The upper beak bone is sort of

a membership card for Ceratopsian dinosaurs. Previous fossils of early Ceratopsians from North America have been pretty fragmentary. This specimen is nearly 20 million years older than any other well-known Ceratopsian from our continent.”

The fossil record suggests that horned dinosaurs arose in Asia and dispersed to North America near the present-day Bering Strait by about 108 million years ago, the age of Aquilops. Surprisingly, however, the study by Farke and colleagues places Aquilops near the base of the Ceratopsian family tree, far removed from horn-bearing Triceratops and other North American relatives.

Relationships among these upper branches of the genealogical tree suggest that two or more immigration events happened later in the Cretaceous era. “Life on land underwent profound changes during the latter part of the age of dinosaurs. This new find supports the view that migration events were fundamental in driving those changes,” says Farke. “Aquilops represents just one of many groups that made the trek from Asia to North America.”

“This is a special project because we only have one skull,” says Matt Wedel, a co-author of the Aquilops scientific paper. “I hope more come to light in the future, but for now this is it so we really want to do this right the first time.” The research describing Aquilops was published this past December in the peer-reviewed journal *PLOS ONE*.

The Aquilops skull will be stored in the vertebrate paleontology collection at the Sam Noble Museum and will be the nucleus for development of an in-house virtual exhibit to open during 2015 in the museum’s Hall of Ancient Life. It will be shown alongside the museum’s Pentaceratops, which holds the Guinness World Record for the largest dinosaur skull ever found.

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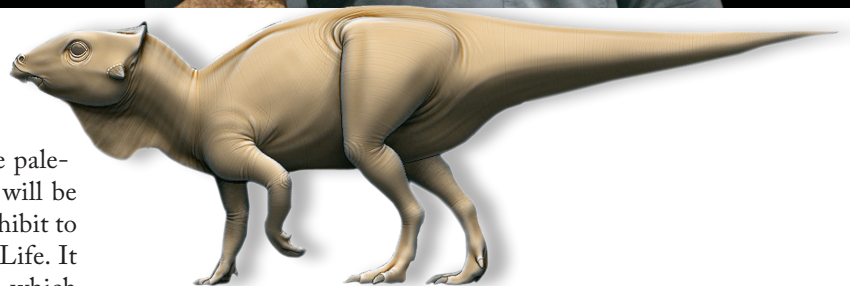


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No bigger than a lemon, this tiny Aquilops skull has made a king-sized impact in the history of the horned dinosaurs known as Ceratopsia. The new species is estimated to be 20 million years older than its nearest relative.



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Paleontology curator Richard Cifelli stands in the shadow of Pentaceratops, which boasts the world’s largest dinosaur skull, and the petite Aquilops, whose name translates to “American eagle face.” The two specimens will be the focus of a virtual exhibit at the Sam Noble Museum this year.