

Dinosaur skull turns paleontology assumptions on their head

November 26 2019, by Andrew Lyle



Paleontologist Scott Persons, pictured alongside the partially-uncovered skull. The *Styracosaurus* skull has implications for how horned dinosaurs are identified. Credit: Scott Persons.

A team of researchers at the University of Alberta has unearthed a well-preserved *Styracosaurus* skull—and its facial imperfections have implications for how paleontologists identify new species of dinosaurs.

The [skull](#) was discovered by Scott Persons in 2015, then a [graduate student](#) in the Department of Biological Sciences, during an expedition in the badlands northwest of Dinosaur Provincial Park.

Nicknamed Hannah, the dinosaur was a Styracosaurus—a [horned dinosaur](#) over five metres in length with a fan of long horns. UAlberta [paleontologists](#) led by Robert Holmes, professor in the Department of Biological Sciences, have learned much from those horns—because they aren't symmetrical.

"When parts of one side of the skull were missing, paleontologists have assumed that the missing side was symmetrical to the one that was preserved," explained Persons. "Turns out, it isn't necessarily. Today, deer often have left and right antlers that are different in terms of their branching patterns. Hannah shows dramatically that dinosaurs could be the same way."

The differences in the skull's left and right halves are so extreme that had the paleontologists found only isolated halves, they might have concluded that they belong to two different species



Hannah's skull, seen from all sides. The jacket used to recover Hannah's skull weighed 2500 kilograms—requiring a helicopter to retrieve from the field!
Credit: Scott Persons.

"The skull shows how much morphological variability there was in the genus," said Holmes. Like the antlers of modern deer and moose, Hannah shows that the pattern of dinosaur horns could vary significantly—meaning some fossils that were once assumed to be unique species will have to be reevaluated.

Tradition dictates that the person who finds an important dinosaur specimen gets to give it a nickname. "Hannah the dinosaur is named after my dog," explained Persons, now a professor and museum curator at the College of Charleston. "She's a good dog, and I knew she was home missing me while I was away on the expedition."

Despite the nickname, paleontologists have no way of knowing if the dinosaur was female. But they have learned other details from the skull—from a partnership with researchers in the Faculty of Engineering.

"Ahmed Qureshi and graduate student Baltej Rupal in the Faculty of Engineering assisted us in performing a 3-D laser scan of the skull," said Persons. "That let our publication to include a digital reconstruction, allowing scientists all over the world to download the 3-D model and inspect it in detail."

"This is the future of paleontological collections: digital [dinosaurs](#)."

The paper, "Morphological variation and asymmetrical development in the skull of *Styracosaurus albertensis*", was published in *Cretaceous Research*.

More information: Robert B. Holmes et al, Morphological variation and asymmetrical development in the skull of *Styracosaurus albertensis*, *Cretaceous Research* (2019). [DOI: 10.1016/j.cretres.2019.104308](https://doi.org/10.1016/j.cretres.2019.104308)

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