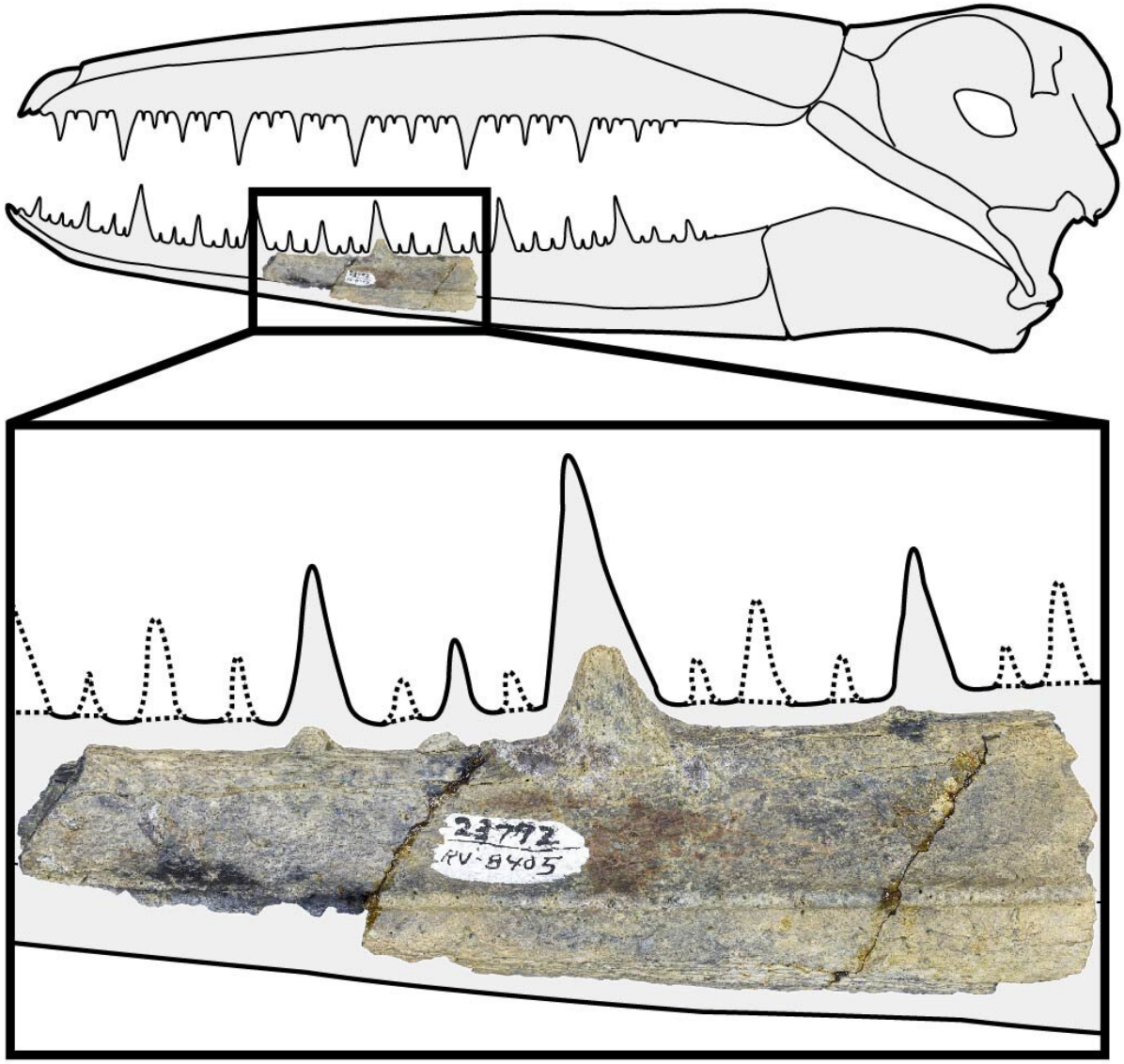
Antarctica yields oldest fossils of giant birds with 6.4-meter wingspans

October 27 2020, by Robert Sanders



This five-inch segment of fossilized jaw, which was discovered in Antarctica in

the 1980s, dates from 40 million years ago. The skull of the bird would have been about two feet long, while the pseudoteeth, which were originally covered with horny keratin, would have been up to an inch long. At this scale, the bird's wingspan would have been 5 to 6 meters, or some 20 feet. Credit: UC Berkeley image by Peter Kloess

Fossils recovered from Antarctica in the 1980s represent the oldest giant members of an extinct group of birds that patrolled the southern oceans with wingspans of up to 21 feet (6.4 meters) that would dwarf the 11½-foot wingspan of today's largest bird, the wandering albatross.

Called pelagornithids, the birds filled a niche much like that of today's albatrosses and traveled widely over Earth's oceans for at least 60 million years. Though a much smaller pelagornithid fossil dates from 62 million years ago, one of the newly described fossils—a 50 million-year-old portion of a bird's foot—shows that the larger pelagornithids arose just after life rebounded from the mass extinction 65 million years ago, when the relatives of birds, the dinosaurs, went extinct. A second pelagornithid fossil, part of a jaw bone, dates from about 40 million years ago.

"Our fossil discovery, with its estimate of a 5-to-6-meter wingspan—nearly 20 feet—shows that birds evolved to a truly gigantic size relatively quickly after the extinction of the dinosaurs and ruled over the oceans for millions of years," said Peter Kloess, a graduate student at the University of California, Berkeley.

The last known pelagornithid is from 2.5 million years ago, a time of changing climate as Earth cooled, and the ice ages began.

Kloess is the lead author of a paper describing the fossil that appears this week in the open access journal *Scientific Reports*. His co-authors are

Ashley Poust of the San Diego Natural History Museum and Thomas Stidham of the Institute of Vertebrate Paleontology and Paleoanthropology at the Chinese Academy of Sciences in Beijing. Both Poust and Stidham received their Ph.Ds from UC Berkeley.

Birds with pseudoteeth

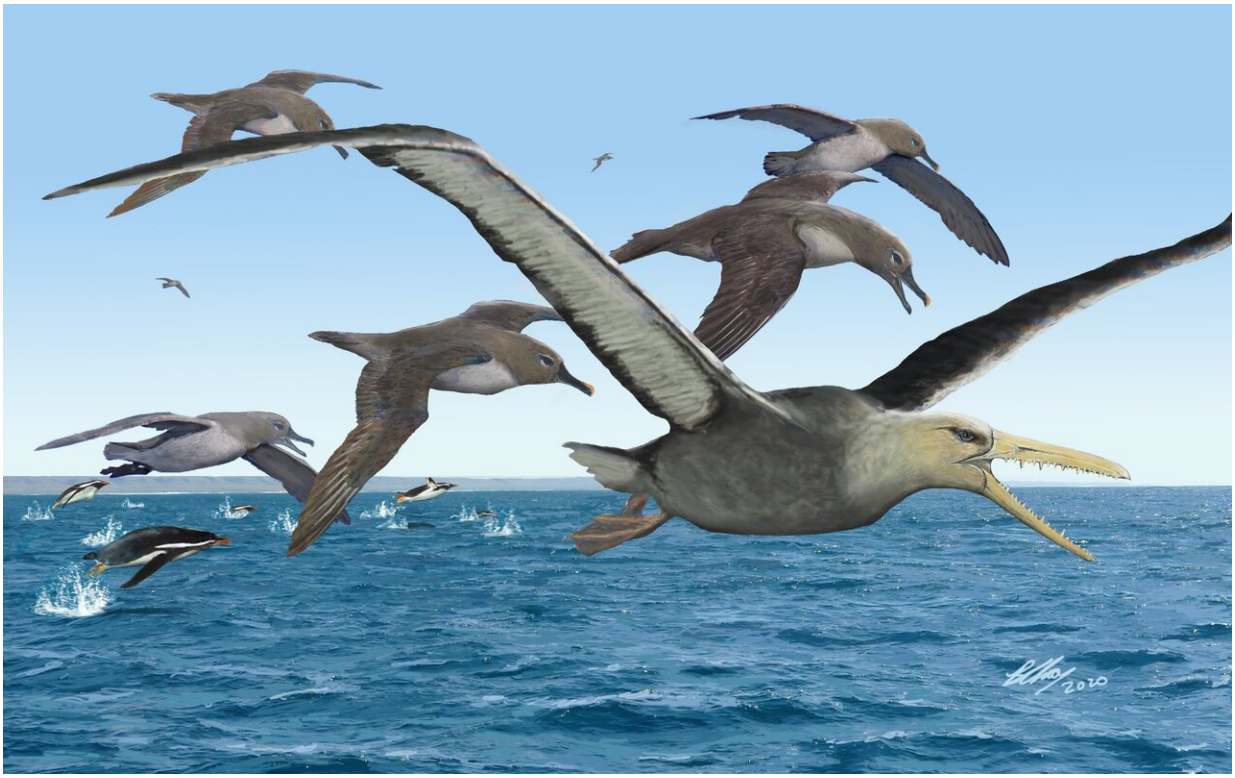
Pelagornithids are known as 'bony-toothed' birds because of the bony projections, or struts, on their jaws that resemble sharp-pointed teeth, though they are not true teeth, like those of humans and other mammals. The bony protrusions were covered by a horny material, keratin, which is like our fingernails. Called pseudoteeth, the struts helped the birds snag squid and fish from the sea as they soared for perhaps weeks at a time over much of Earth's oceans.

Large flying animals have periodically appeared on Earth, starting with the pterosaurs that flapped their leathery wings during the dinosaur era and reached wingspans of 33 feet. The pelagornithids came along to claim the wingspan record in the Cenozoic, after the mass extinction, and lived until about 2.5 million years ago. Around that same time, teratorns, now extinct, ruled the skies.

The birds, related to vultures, "evolved wingspans close to what we see in these bony-toothed birds (pelagornithids)," said Poust. "However, in terms of time, teratorns come in second place with their giant size, having evolved 40 million years after these pelagornithids lived. The extreme, giant size of these extinct birds is unsurpassed in ocean habitats,""

The fossils that the paleontologists describe are among many collected in the mid-1980s from Seymour Island, off the northernmost tip of the Antarctic Peninsula, by teams led by UC Riverside paleontologists. These finds were subsequently moved to the UC Museum of

Paleontology at UC Berkeley.



An artist's depiction of ancient albatrosses harassing a pelagornithid -- with its fearsome toothed beak -- as penguins frolic in the oceans around Antarctica 50 million years ago. Credit: Copyright Brian Choo

Kloess stumbled across the specimens while poking around the collections as a newly arrived graduate student in 2015. He had obtained his master's degree from Cal State-Fullerton with a thesis on coastal marine birds of the Miocene era, between 17 million and 5 million years ago, that was based on specimens he found in museum collections, including those in the UCMP.

"I love going to collections and just finding treasures there," he said.

"Somebody has called me a museum rat, and I take that as a badge of honor. I love scurrying around, finding things that people overlook."

Reviewing the original notes by former UC Riverside student Judd Case, now a professor at Eastern Washington University near Spokane, Kloess realized that the fossil foot bone—a so-called tarsometatarsus—came from an older geological formation than originally thought. That meant that the fossil was about 50 million years old instead of 40 million years old. It is the largest specimen known for the entire extinct group of pelagornithids.

The other rediscovered fossil, the middle portion of the lower jaw, has parts of its pseudoteeth preserved; they would have been up to 3 cm (1 inch) tall when the bird was alive. The approximately 12-cm (5-inch-) long preserved section of jaw came from a very large skull that would have been up to 60 cm (2 feet) long. Using measurements of the size and spacing of those teeth and analytical comparisons to other fossils of pelagornithids, the authors are able to show that this fragment came from an individual bird as big, if not bigger, than the largest known skeletons of the bony-toothed bird group.

A warm Antarctica was a bird playground

Fifty million years ago, Antarctica had a much warmer climate during the time known as the Eocene and was not the forbidding, icy continent we know today, Stidham noted. Alongside extinct land mammals, like marsupials and distant relatives of sloths and anteaters, a diversity of Antarctic birds occupied the land, sea and air.

The southern oceans were the playground for early penguin species, as well as extinct relatives of living ducks, ostriches, petrels and other bird groups, many of which lived on the islands of the Antarctic Peninsula. The new research documents that these extinct, predatory, large- and

giant-sized bony-toothed birds were part of the Antarctic ecosystem for over 10 million years, flying side-by-side over the heads of swimming penguins.

"In a lifestyle likely similar to living albatrosses, the giant extinct pelagornithids, with their very long-pointed wings, would have flown widely over the ancient open seas, which had yet to be dominated by whales and seals, in search of squid, fish and other seafood to catch with their beaks lined with sharp pseudoteeth," said Stidham. "The big ones are nearly twice the size of albatrosses, and these bony-toothed birds would have been formidable predators that evolved to be at the top of their ecosystem."

Museum collections like those in the UCMP, and the people like Kloess, Poust and Stidham to mine them, are key to reconstructing these ancient habitats.

"Collections are vastly important, so making discoveries like this pelagornithid wouldn't have happened if we didn't have these specimens in the public trust, whether at UC Riverside or now at Berkeley," Kloess said. "The fact that they exist for researchers to look at and study has incredible value."

More information: Peter A. Kloess et al, Earliest fossils of giant-sized bony-toothed birds (Aves: Pelagornithidae) from the Eocene of Seymour Island, Antarctica, *Scientific Reports* (2020). DOI: 10.1038/s41598-020-75248-6

Provided by University of California - Berkeley

Citation: Antarctica yields oldest fossils of giant birds with 6.4-meter wingspans (2020, October

27) retrieved 19 April 2024 from https://phys.org/news/2020-10-antarctica-yields-oldest-fossils-giant.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.