

Ancient Birds Flew On All-Fours

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The earliest known ancestor of modern-day birds took to the skies by gliding from trees using primitive feathered wings on their arms and legs, according to new research by a University of Calgary paleontologist. In a paper published in the journal *Paleobiology*, Department of Biological Sciences PhD student Nick Longrich challenges the idea that birds began flying by taking off from the ground while running and shows that the dinosaur-like bird *Archaeopteryx* soared using wing-like feathers on all of its limbs.

"The discussions about the origins of avian flight have been dominated by the so-called 'ground up' and 'trees down' hypotheses," Longrich said. "This paper puts forward some of the strongest evidence yet that birds descended from arboreal parachuters and gliders, similar to modern flying squirrels."

The first fossil of the Jurassic-era dinosaur *Archaeopteryx lithographica* was discovered in Germany in 1861, two years after Charles Darwin published his theory of evolution in *On The Origin of Species*. Since then, eight additional specimens have been unearthed and *Archaeopteryx* is considered the best evidence that birds evolved from dinosaurs since it had both feathers and a bird-like wishbone, along with classic reptilian features of a long bony tail, claws and teeth.

Although scientists immediately noticed feather-like structures on the hind limbs, they were dismissed as insulating body feathers that didn't play a role in the animal's flight. It wasn't until several four-winged dinosaurs in China were described in 2002 that researchers began to re-

examine Archaeopteryx's legs.

"The idea of a multi-winged Archaeopteryx has been around for more than a century, but it hasn't received much attention," Longrich said. "I believe one reason for this is that people tend to see what they want or expect to see. Everybody knows that birds don't have four wings, so we overlooked them even when they were right under our noses."

Under the supervision of professor Anthony Russell, Longrich examined Archaeopteryx fossils and determined that the dinosaur's leg feathers have an aerodynamic structure that imply its rear limbs likely acted as lift-generating "winglets" that played a significant role in flight.

Nick Longrich's paper, "Structure and function of hindlimb feathers in Archaeopteryx lithographica" appears in the September, 2006 issue of the journal Paleobiology.

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