

# Hints of a Downy Dinosaur in China

Chinese paleontologists have unearthed the fossilized skeleton of a small dinosaur cloaked in what appears to be a layer of short feathers. Found only 2 months ago, the fossil has yet to undergo in-depth analysis by Chinese or Western scientists. Nevertheless, word of the find has electrified paleontologists worldwide because it appears to provide the most dramatic evidence to date that birds evolved from small feathered dinosaurs.

"This is going to be a benchmark for understanding the origins of birds," says Luis M. Chiappe, a paleontologist who studies bird evolution at the American Museum of Natural History in New York.

"When I first saw the photographs of it, I was skeptical. But when I was shown the specimen, it just blew me away," says Philip J. Currie, a dinosaur specialist at the Tyrrell Museum of Paleontology in Drumheller, Alberta.

Despite the find's apparent importance, no authority on dinosaurs has yet had an opportunity to analyze the fossil fully, so any conclusions remain unsupported.

Currie is one of the few Western paleontologists to have examined the specimen, which he viewed for just 1 hour while visiting Beijing earlier this month with Canadian artist Michael Skrepnick. Last week, at the annual meeting of the Society of Vertebrate Paleontology in New York, researchers milled around Currie as he showed them a single 3-by-5-inch photograph of the fossil and the artist's reconstruction of the dinosaur.

The 1-meter-long fossil hails from a site in Liaoning province in northeastern China, where paleontologists have recently discovered exquisitely preserved fossils of ancient birds, complete with the impressions left by their feathers (SN: 10/28/95, p. 277). Dated at somewhere between 140 million and 120 million years ago, the new dinosaur fossil exists in two pieces, a slab and a mirror-image counterslab. One half currently resides in Beijing at a museum of the Ministry of Geology and Mineral Resources. The other half lies in a museum at the Nanjing Institute of Geology and Palaeontology.

The Chinese scientists in possession of each half are invertebrate paleontologists, so they must solicit help from dinosaur and bird specialists to assess the fossil. Chen Pei-ji of the Nanjing Institute, who is working with the specimen there, says he has not yet examined the fossil under a microscope because he left China soon after the discovery to visit colleagues in the United States. He

showed pictures of the Nanjing specimen to paleontologists at last week's meeting in New York, but he did not make a formal presentation.

Although Currie did not have an opportunity to study the fossil under a microscope, he inspected the Beijing specimen with a hand-held magnifying lens as Chinese researchers fired questions at him. The feathery impressions are only a few millimeters long and resemble down more than the extended feathers seen on avian wings, he says. They run along the perimeter of the fossil, from the top of the head down to the tip of the tail and then around the underside of the tail.

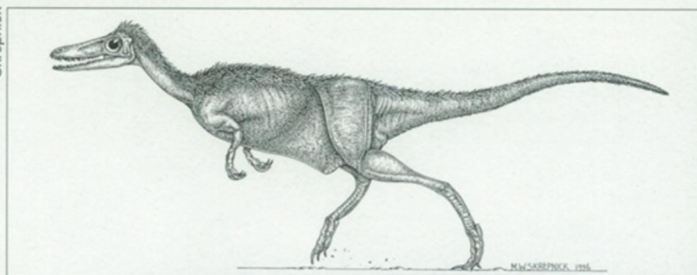
"They look so much like the feather impressions seen in the bird fossils at the same site that you can't come to any conclusion other than the fact that you're dealing with feathers," says Currie. "Now, they may not be feathers. They may be featherlike scales, they may be hair, they may be something else. Until the detailed work is done on it, you can't really tell. But the bottom line is that, now, I don't think there is any question that these dinosaurs had insulation of some kind, and in all probability it was feathers."

The idea that dinosaurs gave rise to birds has circulated since the 1860s, but it remained unpopular until it was revived in the 1970s by John Ostrom of Yale University. From his studies of the earliest known bird, *Archaeopteryx*, Ostrom recognized various anatomical similarities between the ancient bird and a group of bipedal dinosaurs called coelurosaurs.

Although many paleontologists at the time viewed dinosaurs as clumsy and cold-blooded, Ostrom theorized that coelurosaurs and other theropod dinosaurs were agile, warm-blooded predators. According to his theory, birds evolved from a specialized kind of theropod that ran along the ground and jumped in the air after insects.

While few paleontologists defend this exact scenario, the idea that birds are a type of dinosaur has gained credence from detailed phylogenetic analyses, and it now enjoys the support of most—though not all—paleontologists. Yet no one had ever discovered the most compelling evidence—a feathered dinosaur.

Ostrom never expected to see such direct proof: Feathers are extremely frag-



This sketch shows feathery structures on the new dinosaur's head, back, and tail. Map indicates where fossil was found.

ile and usually disappear without leaving any fossilized trace. When he saw the photographs last week, Ostrom was flabbergasted. "I was really in a state of shock. I did not think my legs would hold me up."

The Chinese fossil seems closely related to the coelurosaur *Compsagnathus*, one of the smallest dinosaurs. The Liaoning animal cannot be considered a direct bird ancestor because it came well after the time of *Archaeopteryx*, which lived 150 million years ago. If the bird-dinosaur theory is correct, true birds must have split off the theropod line before *Archaeopteryx*.

For now, critics of the theory remain undaunted by the new find. Larry D. Martin of the University of Kansas in Lawrence says that the structures on the back of the Chinese dinosaur may be the frayed remnants of dermal scales, similar to the frill running down the back of an iguana. In that case, the find would say little about the origin of birds.

Martin acknowledges that the discovery of a feathered dinosaur would force him to reconsider the bird-dinosaur theory. "If these are clearly feathers, then you could make a really serious argument that birds are dinosaurs."

Like most paleontologists, however, Martin awaits a detailed report on the new find. "The possibility for having egg on the face is tremendous at this point," he says. "We generally get more hard evidence with alien abductions than we have here."  
—R. Monastersky