

IQ • Dino tail feathers

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BY SETH BORENSTEIN
AP Science Writer

Scientists have for the first time confirmed color in a dinosaur. Don't think purple Barney, but reddish-orange Conan O'Brien.

The first solid proof of pigmentation has been spotted in the fossilized tail feathers of a smallish meat-eating dinosaur found in China and named *Sinosauropteryx*. The creature seems to have russet colored rings, according to a paper published online last week in the journal *Nature*.

That 125 million-year-old tail has the same internal cellular coloring agents as the hair of a red-haired person, said study lead author Mike Benton, a professor of paleontology at the University of Bristol in England. And the same finding provides what some outside experts say is even more conclusive evidence that some dinosaurs had feathers, further linking them to birds.

Benton and his colleagues didn't actually see the reddish color itself. Using an electron microscope, they spotted the specific cellular signs of the color. An earlier study by another group of researchers and Benton's team found similar cellular color hints in prehistoric bird feathers.

Drawings of dinosaurs show them in all sorts of hues, usually duller earth tones such as brown and gray, but scientists have only speculated on their coloring. As their connection to birds came to light, so did the idea of brighter colors. But until now, there was no proof of any coloring.

Before Benton's technique, which is likely to be copied with other dinosaur fossils, paleontologists had to look to a dinosaur's anatomy to guess at colors, said famed dinosaur expert Paul Sereno at the University of Chicago. The color and the feathers were probably used for display, like a peacock, he theorized. Sereno, who wasn't part of Benton's team, called it a "landmark paper" that gives us "a sneak peek at how they might have appeared when alive."

"That's really cool just to be able to pin down this aspect," said University of Maryland paleontologist Thomas Holtz Jr., who wasn't part of the discovery team. "It does sort of help bring a more complete view of the living creature ... and further from just being a bunch of bones."

This dinosaur was "a dinky little guy," Holtz said. Adult *Sinosauropteryx* were about three feet long, but the tail accounted for more than half of that length and it had a long neck, so "there's not a lot of dinosaur there," he said. It fed on small mammals, sort of like a prehistoric roadrunner, he said.

While some dinosaurs are rather closely connected to birds evolutionarily, *Sinosauropteryx* is not. It was around earlier than the beginnings of birds and is the "most primitive feathered" dinosaur, Benton said. And those feathers, early

On the Net:

Nature:
<http://www.nature.com/nature>

in their evolutionary development, resemble tiny bristles, less than one-fifth of an inch tall, he said.

"They are stuffed with melanosomes just like any other feathers," Benton said. Melanosomes are molecules that contain color-producing pigments. With the pigment long gone in fossils, the shape of the melanosome shows what color it used to be. *Sinosauropteryx* had sphere-shaped melanosomes which translate to red, and sausage-shaped ones which are whitish-gray.

He and other researchers say the findings also strongly suggest these are feathers and not cartilage or some other tissue. Benton said it disproves the concept that the material is bacteria, a theory floated by a handful of scientists who still disagree with the mainstream view that dinosaurs had feathers.

One of those feather skeptics, John Feduccia at the University of North Carolina, was not convinced by the Benton study. He said the melanosomes are not similar to those of other animals and doesn't disprove the bacteria concept.

"Many people want dinosaurs to be feathered, so evidence is typically stretched beyond its content," Feduccia said in an e-mail. "There is a strong lure to be able to vicariously study dinosaurs at the backyard bird feeder."

However, Sereno said Benton's research makes the case that cells couldn't be bacteria because they are packed orderly instead of randomly.

The idea of feathers on dinosaurs and the link to birds "is pretty much, I think, a done deal," Sereno said.

were carrot colored



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How did melanosomes help the research?

A depiction: These renderings by artist Jim Robins, provided by the University of Bristol shows a single *Sinosauropteryx*, sporting its orange and white striped tail. Scientists have for the first time confirmed color in a dinosaur. — AP PHOTO/UNIVERSITY OF BRISTOL, JIM ROBINS

Fossilized image: This undated image released by the University of Bristol shows the fossil of a small Chinese theropod dinosaur *Sinosauropteryx*, a complete specimen in the Nanjing Institute. Short, bristle-like feathers run along the midline of the head, neck, and back, and all round the tail, forming irregular stripes. — AP PHOTO/NANJING INSTITUTE



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—MIKE BENTON, PROFESSOR OF PALEONTOLOGY AT THE UNIVERSITY OF BRISTOL IN ENGLAND

Museum treasures imperiled by klutzy visitors

BY LEANNE ITALIE
Associated Press Writer

A trip here. A misplaced elbow there. The stumbling art student who tore a Picasso tapped into the worst fears of clumsy grown-ups and every well-intentioned parent who dares venture into big-people museums with small children.

Signs demanding DO NOT TOUCH don't mean much when accidents happen, especially when the culprits aren't old enough to read but are small enough — and antsy enough — to dash through barriers.

The Moment for Julie Morrison of Taylorsville, Utah, came at Elvis Presley's Graceland, a huge attraction in Memphis, Tenn., with more than 600,000 visitors a year. All she wanted to do was feed her then 4-year-old son's interest in the King. The boy was regaling his family with fun facts when his little brother disappeared.

"We were in line at the grave site when I glanced around and there on

top of Elvis' grave was my 18-month-old. He had squeezed through the rod-iron gate. I was horrified!" she said.

Morrison was too big to follow him, resorting to bear crackers as a bribe to get him in her clutches. "Eyes were burning on my neck."

On the same three-week, cross-country trip, her little escape artist climbed over faux boulders to get to a dinosaur at a museum out West. "I bent over to tie my 4-year old's shoe. When I stood up, Zac had scaled the boulders and headed into the exhibit to touch the dinosaur," she said.

Politely worded rules for kids and adults on how to avoid damaging sometimes priceless work are plastered on museum Web sites, especially those that have opened their doors to splashy, crowd-pleasing exhibitions, special

events that sometimes include alcohol service — and tipsy guests — and art appreciation classes for young and old.

The woman who lost her balance and fell onto Picasso's "The Actor" at the Metropolitan Museum of Art last week was attending an art class when she stumbled. The museum's director, Thomas P. Campbell, is pursuing a review of policies and procedures in the aftermath of the 6-inch tear that restorers will repair.

While near misses are more common than direct hits, serious damage has been done by the clumsy.

In 2008, a 9-foot-tall ceramic totem by Costa Rican artist Tatiana Echeverri Fernandez and on view at the Royal Academy of Arts in London broke into pieces after a visitor tripped into it. Two years prior, at the Fitzwilliam Museum in Cambridge, a man who had bent over to tie his shoes tripped over a lace and fell down a flight of stairs into a nearly 100-pound Qing Dynasty vase and two others dat-

ing from the late 17th century or early 18th century.

The vase was left in 113 pieces that were put back together, but its value was seriously compromised.

"I snagged my shoelace, missed the step and crash, bang, wallop — there were a million pieces of high-quality Qing ceramics lying around underneath me," Nick Flynn told the AP at the time.

Steve Wynn knows the feeling. The casino mogul was about to sell Picasso's "Le Reve" for \$139 million in 2006 when he elbowed the work while showing it to friends, poking a thumb-size hole through the canvas. The portrait of a Picasso mistress was repaired and Wynn decided to keep it.

"We have near misses every day," said Michelle A. Lehrman Jenness, security chief at The Art Institute of Chicago. "The officers are trained in reading body language. If somebody is waving around a brochure, pointing at a painting, for instance, we'll ask them to step back before anything happens."



"The Actor," a painting from Picasso's rose period. A 6-inch tear occurred in the canvas' lower right-hand corner when a woman lost her balance and fell on the painting. — AP PHOTO/METROPOLITAN MUSEUM OF ART, COPYRIGHT ESTATE OF PABLO PICASSO/ARTISTS RIGHTS SOCIETY (ARS), NEW YORK