

Feathered Dinosaurs Found in China

In the academic cockfight over bird origins, dinosaur researchers have discovered something to crow about. Two species of feathered dinosaurs have turned up in China, clinching the argument that birds arose from meat-eating dinosaurs, reports an international team of paleontologists this week.

"This is the most important dinosaur discovery of this century," says one of the researchers, Philip J. Currie of the Royal Tyrrell Museum of Paleontology in Drumheller, Alberta. "The credibility of the dinosaur-to-birds theory has just taken a gigantic leap ahead with these specimens."

Since the 1860s, scientists have been debating whether dinosaurs sired birds. In recent years, numerous finds have supported the hypothesis that birds descended from two-legged, running dinosaurs called theropods (SN: 8/23/97, p. 120). Dramatic evidence emerged in 1996 with the discovery of a Chinese theropod, *Sinosauropteryx*, that bore a coat of downy fibers, perhaps the evolutionary forerunners of true feathers.

A few researchers, however, have pecked at the theory, arguing instead that birds evolved from four-legged arboreal reptiles. They regard any similarity between birds and dinosaurs as an example of convergent evolution, by which two independent groups grow to look alike. These critics maintain that *Sinosauropteryx*'s fibers were not down but actually a reptilian frill.

The plumage on the new Chinese dinosaurs brushes away such arguments because it is identical to bird feathers, says Currie. The structures have a central shaft with parallel barbs on either side, report Ji Qiang and Ji Shu-An of the National Geological Museum in Beijing, Currie, and Mark A. Norell of the American Museum of Natural History in New York at a press conference on June 23 at the National Geographic Society in Washington, D.C., and in the June 25 NATURE.

The two new Chinese dinosaurs—be-

tween 145 million and 125 million years old—come from the same fossil treasure trove in Liaoning province that yielded *Sinosauropteryx*. One of the feathered dinosaurs is named *Protarchaeopteryx robusta* because it had a more primitive anatomy than the oldest known bird, the 150-million-year-old *Archaeopteryx*. Two other specimens belong to a new species, *Caudipteryx zoui*, which is the closest known relative of birds.

The fossils are considered theropod dinosaurs rather than true birds because they lack a number of features seen in *Archaeopteryx* and more advanced birds, says Norell. He and his colleagues doubt that the creatures could fly because they had relatively short forelimbs, short feathers, and a body twice the size of *Archaeopteryx*. What's more, their feathers had a symmetrical shape like that seen in flightless birds today.

Critics of the bird-dinosaur theory remain unflappable in the face of the new evidence. Ornithologist Alan Feduccia of the University of North Carolina at Chapel Hill surmises that the new finds are actually ancient birds that lost the power of flight and came to resemble theropods



Feathers attached to *Caudipteryx*'s forelimb.

superficially. "The fact that they had elongate feathers indicates that they came from a flighted ancestor," he says.

Such arguments don't fly with most paleontologists, however. "These are animals that seem to be, by all appearances, fairly conventional dinosaurs. They are not flightless birds," says Lawrence M. Witmer of Ohio University in Athens.

If feathers appeared first on ground-dwelling dinosaurs, then they must have originally served some purpose unrelated to flight. Some scientists speculate that down, like the *Sinosauropteryx* structures, evolved first and insulated the bodies of small theropods. Large plumes later may have served as a display for attracting mates. —R. Monastersky

Fish eavesdrop on nearby fights

Much like a bunch of guys in a bar, Siamese fighting fish turn to watch a brawl and take note of who's the winner and who's the wimp.

A male who has seen a fight reveals what humans politely call reluctance when it's his turn to tussle with the winner, report Peter K. McGregor at the University of Copenhagen and his colleagues.

The study of animals eavesdropping on each other's interactions is just opening up, says McGregor. Traditionally, animal communication research focuses on one signaler and one receiver, ignoring bystanders. But eavesdropping proves invaluable, he points out. Keeping track of fights offers data on dominance with no risk of bodily harm. Without such snooping "you'd wind up in bits before you had all the information," McGregor says.

Previous observations hinted that birds use clues from monitoring neighbors' territorial scraps, he notes. A red-winged blackbird who attacks with zest when researchers present a stuffed bird suffers fewer territorial intrusions afterward than the bird who attacks the dummy half-heartedly.

McGregor believes the new experiments are the first to examine rubber-

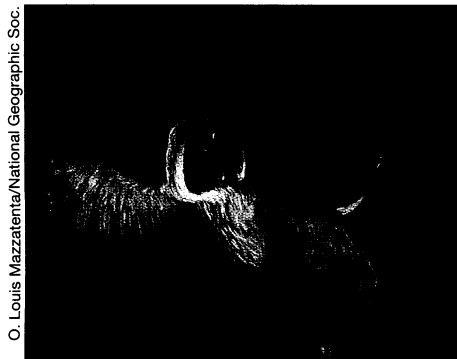
necking during fish fights. The results appear in the June 22 PROCEEDINGS OF THE ROYAL SOCIETY OF LONDON B.

The researchers observed nearby fish during showy clashes between Siamese males in laboratory tanks. Even males in separate compartments, away from ripples or chemical cues, seemed to watch the contest, the team reports.

McGregor and his coworkers next allowed a male to view only one of two simultaneous fights. That bystander took four times longer to approach the winner of the fight he had just seen than to swim up to the loser. However, in confronting fish from the battle he missed, the male showed no significant difference in approach.

Some mammals and highly social birds clearly keep an eye on neighbors, observes David W. Dunham, who has studied fighting fish at the University of Toronto. "When you get down to lower animals, it's much more difficult to find good evidence of that kind of thing."

The new fish findings remind him of a phenomenon called copying in guppies. Smaller females change their preferences for male colors after seeing a large, important female near a male of a particular hue. —S. Milius



Model of dinosaur *Caudipteryx zoui*.