The bird calls that filled Jurassic Park

For more than a century, the lowest branches of the avian family tree seemed a lonely place, occupied by the solitary species *Archaeopteryx lithographica*, the oldest known bird. But recent fossil discoveries from Asia are filling in the bottom boughs, dramatically altering the picture of early avian history.

In the Oct. 19 NATURE, Chinese and U.S. paleontologists describe several new fossils belonging to a bird species that lived roughly 140 million years ago. Called *Confuciusornis sanctus*, this pigeon-size flier hails from the end of the Jurassic period, making it only slightly younger than the 150-million-year-old *Archaeopteryx*.

Korean scientists have found another, presumably Jurassic bird fossil, the researchers note, but the Korean group has not yet published a description of the specimen in a scientific journal.

The new findings show that at the time of *Archaeopteryx*, or even before, birds were evolving in many different directions, says study coauthor Alan Feduccia, an ornithologist at the University of North Carolina at Chapel Hill. "So while we've been concentrating on this ancient bird *Archaeopteryx* as the key to the whole problem of bird evolution, it may just have been a sideline, [with] many branches of the avian tree evolving almost simultaneously."

The other authors of the NATURE study were Lian-hai Hou and Zhonghe Zhou of the Chinese Academy of Sciences in Beijing and Larry D. Martin of the University of Kansas in Lawrence. Hou, Zhou, and another Chinese colleague first announced the discovery of *Confuciusornis* earlier this year in a Chinese journal.

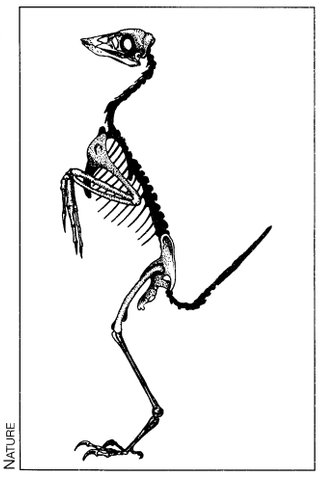
Found in the northeast province of Liaoning, the *Confuciusornis* fossils display a patchwork of primitive and advanced features. Like *Archaeopteryx*, the Chinese fossils have long fingers with large curved claws, a feature absent in almost all later birds. The design of its front limbs, along with the curved claws on its feet, indicates that *Confuciusornis* could climb trees.

While its body resembles that of the oldest bird, *Confuciusornis'* skull looks much more modern. Unlike most birds from the age of the dinosaurs, but like all living birds, the Chinese species had a horny, toothless beak. Prior to this discovery, scientists had thought that toothless beaks did not appear until the late Cretaceous period, roughly 70 million years ago, says Feduccia.

The *Confuciusornis* find has generated excitement among researchers who study avian evolution.

"It's fantastic to have this burst of findings of early birds," says Luis M. Chiappe of the American Museum of Natural History in New York City. However, Chiappe questions the reported Jurassic age of the Chinese bird.

The exact age of *Confuciusornis* remains unknown. Scientists debate not only the precise age of the fossils, but also the closing date of the Jurassic period. The fossils may fall in the latest part of the Jurassic or the opening of the Cretaceous.


NATURE

Reconstruction of ancient Chinese bird Confuciusornis.

The specimens from Liaoning show evidence that *Confuciusornis* had feathers along its leg, making this the earliest record of contour feathers, as distinct from flight feathers. Scientists do not know whether *Archaeopteryx* had such feathers along its body, but it clearly had flight feathers along its wings and tail.

The presence of contour feathers is important because it bears on whether early birds were warm-blooded. Some researchers have speculated that contour feathers arose first among warm-blooded dinosaurs as a form of insulation. Birds would have inherited feathers from their dinosaurian ancestors and later used them for flight.

But a recent study (SN: 3/14/94, p.312) casts doubt on this theory of feather origins. The bones of some Cretaceous birds have growth rings, a feature common among cold-blooded animals. The find suggests that early birds may not have developed a fully warm-blooded physiology. — *R. Monastersky*

Obsessive-compulsive risks for teens

Contrary to what many researchers and clinicians assume, youngsters who exhibit depression and substance abuse in the first few years of adolescence have a heightened likelihood of developing obsessive-compulsive disorder (OCD) by age 18, a new study finds.

Several factors have been suggested as contributing to OCD, including eating disorders, birth problems that subtly disturb brain development, and Tourette's syndrome (SN: 7/21/90, p.42). However, none of them shows a close link to OCD in the latest investigation, which tracked 930 boys and girls from birth to young adulthood.

"These findings suggest that clinicians should be aware of a risk for emerging OCD among young teenagers who have other [mental] disorders, especially depression and substance abuse," asserts Heidi M. Douglass, who directed the data analysis while a graduate student in psychology at the University of Otago Medical School in Dunedin, New Zealand.

Obsessions consist of repeated, distressing thoughts or impulses, such as the fear of getting contaminated by shaking hands with others. Compulsions are repetitive behaviors or mental acts intended to quell anxiety, such as washing one's hands over and over. Symptoms of the disorder take up 1 or more hours daily.

Douglass and her colleagues drew on an investigation of New Zealand youths that has already yielded clues to the origins of hard-core delinquency (SN: 4/15/95, p.232). Participants are mostly white and come from all social backgrounds. They have completed extensive medical and psychological testing every 2 to 3 years, beginning at age 3.

At age 18, 37 volunteers—4 percent of the total—cited symptoms of OCD that had occurred in the past year. That proportion coincides roughly with previous estimates of OCD's prevalence. The researchers compared this group to 590 teens who had had no mental disorders in the past year, 45 who had exhibited conduct disorder (frequent delinquency and violence) in that period, and 215 who had suffered from anxiety disorders or depression in the past year.

OCD cases typically involved either obsessions or compulsions but not both simultaneously. One or more mental disorders accompanied most instances of OCD, particularly depression, social phobia, and alcohol or marijuana dependence.

Only depression and substance abuse in early adolescence showed a significant elevation in the OCD group, compared to the other groups, Douglass and her coworkers report in the November JOURNAL OF THE AMERICAN ACADEMY OF CHILD AND ADOLESCENT PSYCHIATRY.

Psychiatrists may need to devise a new diagnostic category that combines symptoms of OCD with those of mood disorders such as depression, the researchers propose.

Other proposed risk factors for OCD may apply mainly to the most severe cases, which have attracted the bulk of scientific attention to date, Douglass asserts. — *B. Bower*