Oldest bird and longest dinosaur

Just as the 150-million-year-old *Archaeopteryx* fossil is being reinstated as the earliest known bird after considerable controversy (SN:5/3/86,p.276), along come two crow-size skeletons that are not only 75 million years older than *Archaeopteryx* but also more birdlike, according to the paleontologists who discovered them. The Washington, D.C.-based National Geographic Society, which funded the work, announced this week that Sankar Chatterjee and his colleagues at Texas Tech University in Lubbock found the 225-million-year-old fossils near Post, Tex.

According to paleontologist John Ostrom at Yale University, "the material is so fragmentary that the identification [as a bird] cannot be certified, but it certainly looks as though that's the right interpretation." If so, then the fossils, to which Chatterjee has given the genus name *Protoavis* (ancestral bird), add credence to the notion that birds originally arose from dinosaurs. *Protoavis,* like *Archaeopteryx,* has distinctly dinosaurian features, such as clawed fingers, a tail and teeth, as well as avian characteristics, such as a wishbone.

However, Chatterjee says that *Protoavis* was a much more advanced bird than the *Archaeopteryx* fossils, which lack keel-like breastbones and were poorly suited for flight. "The wing structures of *Protoavis* are so well developed, there's no doubt it could fly," he adds. "And the skull is entirely like that of modern birds." Moreover, with no teeth in the back part of its jaws, *Protoavis* had started down the evolutionary path that enabled later birds, unencumbered by the heavy jaws needed to support teeth, to become masterful fliers, according to Chatterjee.

In Ostrom's view there is not enough fossil evidence to say that *Protoavis* was indeed more advanced. But if Chatterjee is correct, his find lends support to scientists who have argued that *Archaeopteryx* was too primitive to be a direct ancestor of modern birds – that there was too little time for the *Archaeopteryx* to evolve into the great variety of birds, some closely resembling modern species, that developed in the next tens of millions of years.

"Scientists have speculated that somebody would find [a much older bird]," says Chatterjee. "And that is where *Protoavis* fits in."

No impressions of feathers were found with the Texas fossils, but Chatterjee says there are bumps on the forearm and "hand" to which feathers were probably attached. He thinks that *Protoavis* could fly between trees in the tropical forest it lived in, but not much farther.

Ostrom calls the *Protoavis* fossils "an extraordinarily improbable discovery" because the fragile bones of birds are rarely preserved this well. Chatterjee suspects the birds were drowned in a flash flood and were not crushed or deformed because they were entombed by a blanket of mud.

At the other end of the size spectrum from birds are the dinosaur giants. In recent years, scientists have unearthed the remains of *Supersaurus* and *Ultrasaurus,* animals weighing in at about 75 or 80 tons and measuring about 90 to 100 feet long. Now paleontologist David Gillette unveils *Seismosaurus,* or "earthshaker," a dinosaur he thinks was even longer and possibly even larger.

Seismosaurus's bones were discovered by three hikers at a site about 60 miles northwest of Albuquerque. Last year a team led by Gillette, curator of paleontology at the New Mexico Museum of Natural History in Albuquerque, excavated eight joined vertebrae from a 10-foot midsection of the animal's tail, as well as fragments of a thighbone and other as-yet-unidentified bones. The researchers plan to excavate more bones this fall.

In an announcement last week, Gillette estimated that *Seismosaurus* was 100 to 120 feet long, 18 feet tall at the shoulder and 15 feet tall at the hip, and weighed 80 to 100 tons—about 12 times heavier than a modern bull elephant. The 150-million-year-old bones were discovered in the Morrison formation, in which *Supersaurus* and other large, long-necked dinosaurs of the Sauropod family have been found. Paleontologists are not sure whether the recently discovered Sauropods represent new species or are just unusually large individuals of a known species. Gillette's find, says Ostrom, "reinforces the image that many dinosaurs seem to have been very large – larger than any living animal. One can't help wonder why. What's the biological importance of being so huge?" *– S. Weisburd*

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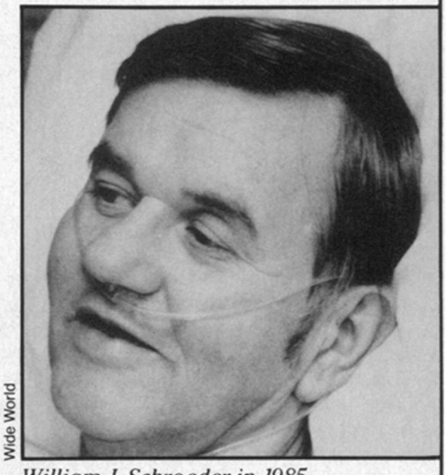
Fossil remains of the oldest bird.

Schroeder's struggle lasts 620 days

William J. Schroeder, the world's longest-surviving recipient of a permanent artificial heart, died Aug. 7. While his death marks the end of a lengthy personal struggle, researchers continue to struggle with the limitations of the artificial heart.

A retired federal worker, a diabetic and the father of six children, Schroeder had smoked cigarettes for 30 years when he quit in 1982. That year, he had his first heart attack; in 1983, he had another. Coronary bypass surgery in 1983 failed to stabilize Schroeder's deteriorating heart, and other health problems arose. In late 1984, surgeons removed Schroeder's gallbladder, but they feared his heart would soon fail.

William DeVries of the Humana Heart Institute in Louisville, Ky., placed the plastic-and-metal Jarvik-7 artificial heart in Schroeder's chest one week later, on Nov. 25, 1984. Despite the success of the operation and Schroeder's initial exuberance, Schroeder soon began to suffer a series of unanticipated complications. Beginning only 18 days after receiving his new heart, Schroeder suffered strokes, seizures, depression, fever and a flulike illness, and received blood transfusions and a variety of drugs, including experimental medication. After 620 days, a fourth series of strokes and ensuing lung complications ended his ordeal.



Wide World

William J. Schroeder in 1985.

Part of the problem with artificial hearts lies in their imperfect replication of natural processes, including the natural production of a hormone involved in regulating blood pressure (SN:11/30/86,p.344). Artificial valves destroy red blood cells, leading to anemia, and cause blood clots, leading to strokes. Consequently, research has recently focused more on using artificial hearts as temporary devices to extend the lives of patients awaiting human donor hearts. Approximately 11 Americans now have temporary artificial hearts. *– T. Kleist*