



Sciencewatch – Oh Those Bones!

The steadfast and loyal readers among you may know that since November 1997 I have written no fewer than five articles in this column concerning the controversy over the theory that modern birds evolved from small, fast-running, meat-eating dinosaurs known as theropods. Theory supporters have pointed to fossils of theropods from deposits in northeastern China, which clearly show the presence of feathers. One such 125-million year old fossil exhibited last spring at the American Museum of Natural History, clearly showed a coat of downy feathers on what is, in all other respects, a dromaeosaurian theropod of the *Velociraptor* type. The theory fires our imagination and has become popular enough for some to talk of eating at Kentucky Fried Brontosaurus or Hadrosaur McNugget. However, even proponents abhor such distortions.

Critics have argued that birds came from a much earlier, more primitive reptilian group, called thecodonts, which also gave rise to dinosaurs. They point to other fossils, which they contend as proof that theropod limb and lung structure was so different from birds as to make it impossible they could be the avian ancestors. The critics also contend that feathers arose much earlier, about 220 million years ago, which is 70 million years earlier than *Archaeopteryx* and even predates dinosaurs. And they too have fossils as proof.

Should all this leave us confused? No! Instead, we should be excited because this is the scientific process in action. Scientific knowledge is gained by point and counterpoint all based upon evidence, which may be reinterpreted as a greater understanding of the pieces of the puzzle is achieved. This is the way scientists pursue the truth, and I have written so often on this controversy not only for its interest to birders, but because it illustrates the scientific process.

The latest piece of supportive evidence comes from an article in the February 14th issue of *Nature*. It describes a new fossil from China, which the authors say offers more conclusive proof for the dinosaur-bird theory. It is written by Xing Xu and Xiao-lin Wang of the Chinese Academy of Sciences, Beijing, China, Peter Makovicky of The Field Museum, Chicago, IL, Xiao-chun Wu of the Canadian Museum of Nature, Ottawa, Canada and Mark Norell of the American Museum of Natural History, New York. These authors describe a new troodontid dinosaur, called *Sinovenator changii*, which was about three feet long and lived 130 million years ago. Although no feather imprints are visible, several distinctly bird-like structures are evident, such as a wishbone (furcula) and a bird-like shoulder joint. An inverted pelvic bone, which is not found in other troodontids, and is typical of modern birds, is also present. Theory proponents claim that this dinosaur was likely covered with feathers, which unfortunately were not preserved.

Troodontid dinosaurs belong to a group known as the maniraptorans (seizing hands), theropod dinosaurs that have many bird-like features such as a furcula. This group includes the above-mentioned dromaeosaurs (also popularly known as raptors) and is touted as being ancestral to birds. At 130 million years old, this fossil theropod comes closest to the age of *Archaeopteryx*, which is why the proponents are cackling.

According to Norell, “This means that any perceived problems about differences in age between the origin of birds and the occurrence of small bird-like theropods disappears.”

Exactly how other feathered fossils from 220 million years ago, mentioned above, fit into this scheme remains to be seen, but you can be sure that opponents will be doing some squawking of their own.

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