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***Ichthyornis* in the Cretaceous of Alabama.**—Apart from *Archaeopteryx* and *Hesperornis*, *Ichthyornis* is perhaps the most famous of fossil birds. It is the sole genus of the Ichthyornithidae, of which O. C. Marsh named six species from the Smoky Hill Chalk, Niobrara Formation, of the Upper Cretaceous of Kansas, and a seventh from the Upper Cretaceous Austin Chalk of Texas (for a list of species see Brodkorb, Bull. Fla. State Mus. Biol. Sci. 11:99–220, 1967). For a time there was controversy (summarized in Brodkorb, p. 19–55, *In* Avian Biology, vol. 1 [Farner and King, eds.], Academic Press, New York, 1971) over whether *Ichthyornis* actually possessed teeth, as Marsh (Odontornithes: a monograph of the extinct toothed birds of North America. U.S. Geol. Expl. 40th Parallel Vol. 7, Govt. Printing Office, Washington, D.C., 1880) had supposed, but the evidence now seems to indicate that it did (Russell, Peabody Mus. Nat. Hist. Yale Univ. Bull. 23:121, footnote, 1967; Gingerich, Condor 74:471–473, 1972). The Ichthyornithidae and another Cretaceous family, the Apatornithidae, form the order Ichthyornithiformes, which Brodkorb (1967) places near the Charadriiformes.

Another Upper Cretaceous bird, *Plegadornis antecessor* Wetmore (Smithson. Misc. Coll. 145[2]:1–17, 1962), was described from the distal end and part of the shaft of a humerus from the Mooreville tongue of the Selma Chalk in Alabama. Wetmore assigned this fossil to a new family, Plegadornithidae, which he placed near the ibises (Threskiornithidae) in the order Ciconiiformes. Recently, Kashin (Ornitologiya 10:336–337, 1972) has pointed out that the name *Plegadornis* Wetmore 1962 is preoccupied by *Plegadornis* Brehm 1855, a synonym of *Plegadis* Kaup 1829. He substituted the new names *Angelinornis* and Angelinornithidae for Wetmore's *Plegadornis* and Plegadornithidae, respectively.

Because *Angelinornis* is roughly contemporaneous with *Ichthyornis*, I undertook a comparison of the two genera. One of the difficulties inherent in this is that most of the specimens of humeri of Marsh's species of *Ichthyornis* are crushed, flattened, and essentially two-dimensional. All comparisons I made of *Angelinornis* with *Ichthyornis* were with a well-preserved distal end of a humerus of *Ichthyornis* (YPM 1764) from the Smoky Hill Chalk. This specimen is almost identical in size to the type of *A. antecessor* (the distal width of both specimens is 10.5 mm). It is intermediate in size between the measurements given by Marsh (1880) for *I. dispar* and *I. victor* but its dimensions are close to those of another specimen (10.3 mm) referred to *I. dispar* by Brodkorb (pers. comm.). I therefore refer YPM 1764 to *I. dispar* pending Dr. Brodkorb's revision of *Ichthyornis*.

The type humerus of *A. antecessor* is extremely similar to the humerus of *I. dispar* (Fig. 1). It has the following features in common with *Ichthyornis*: prominent, truncate ectepicondylar process located rather high on the shaft with a distinct pit at its proximal base; internal and external condyles on about the same distal plane; entepicondyle weak, lying proximal to the internal condyle; entepicondylar prominence well-developed; a deep square depression on the palmar surface bounded by the entepicondylar process, internal condyle, and external condyle; brachial depression shallow; shaft not markedly curved; olecranal fossa shallow and ill-defined; external condyle with a large nutrient foramen at its proximal apex; and tricipital grooves very indistinct. Although the humeri of both *Angelinornis* and *Ichthyornis* bear a superficial resemblance to those of

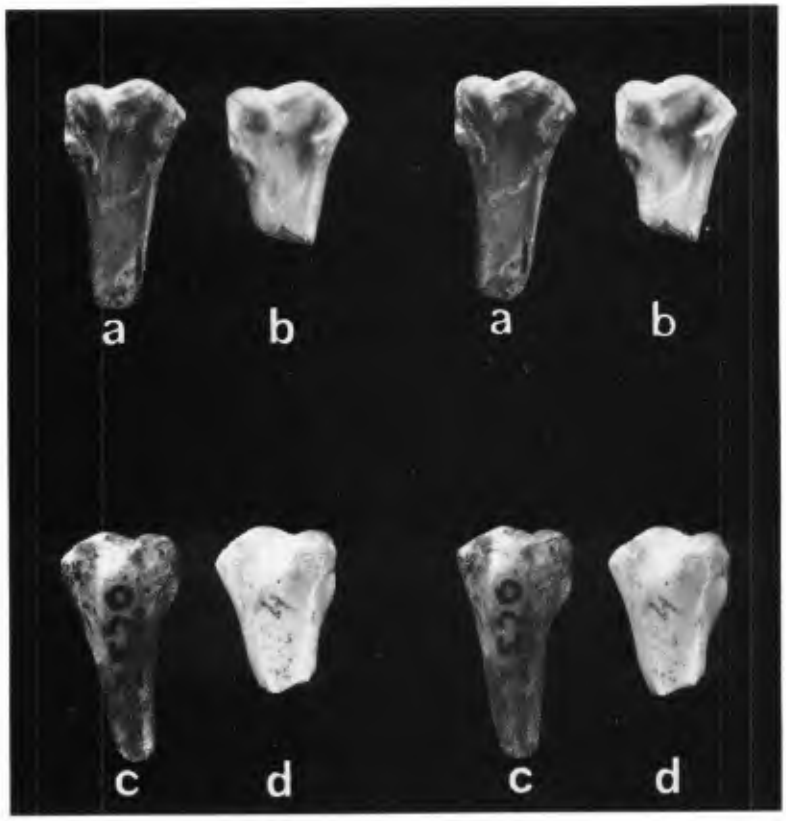

FIG. 1. Stereophotographs of distal ends of humeri of *Ichthyornis*, 1.5 × (palmar view in upper row, anconal view in lower). *a* and *c*, holotype of *I.* ("*Angelinornis*") *antecessor* USNM 22820. *b* and *d*, *I. dispar* YPM 1764.

the Phaethontidae, Threskiornithidae, Burhinidae, and the Cretaceous Telmatornithidae, the above combination of characters distinguishes them from any of these families. Harrison (Bull. Br. Ornithol. Club 93:123–126, 1973) has shown that the proximal end of the humerus of *Ichthyornis* is totally different from that of all other known birds, but unfortunately this part is lacking in *Angelinornis*.

Although the humerus of *Angelinornis antecessor* shows some differences from that of *I. dispar*, I can find nothing in its features that will permit its separation from *Ichthyornis* at the generic level. The differences between *Angelinornis* and *Ichthyornis* are no greater than the intrageneric variation observed within modern taxa of birds. Therefore, I recommend that *Angelinornis* be synonymized with *Ichthyornis*, and that Angelinornithidae be synonymized with Ichthyornithidae.

The type humerus of *I. antecessor* may be distinguished from that of *I. dispar* as follows: shaft not as heavy, brachial depression shallower and located slightly more

distally, ectepicondylar process more prominent, and the pit at the base shallower. There appear to be some differences in the attachment for the anterior articular ligament, but this area is much abraded in the type of *I. antecessor*. In anconal view the two species are virtually inseparable except for the difference in the robustness of the shaft. The type of *I. antecessor* is clearly specifically distinct from the specimen here referred to *I. dispar*. Since the other species in the genus are reported to be either larger or smaller than these specimens, it seems most probable that *antecessor* is a valid species of *Ichthyornis*.

I am most grateful to Pierce Brodkorb for permitting me to examine the specimen of *Ichthyornis dispar* from the Peabody Museum, Yale University (YPM) while it was in his care, and for his discussions of the manuscript. John Farrand, Jr. and Robert J. Emry also read and commented on the manuscript. The photographs are by Victor E. Krantz, to whom my thanks are due. —STORRS L. OLSON, *National Museum of Natural History, Smithsonian Institution, Washington, DC 20560.* *Accepted 3 July 1974.*