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THE GAP BETWEEN STUDIES OF DINOSAURS AND LIVING BIRDS

DYKE G & KAISER G (eds) (2011) *Living dinosaurs. The evolutionary history of modern birds*. Wiley-Blackwell, Oxford. 422 pp. ISBN: 978-0-470-65666-2. Precio: US$ 129.95 (rústica)

Editors Dyke and Kaiser have compiled 16 chapters spanning several major areas of ornithology, including the origin of birds, their subsequent evolution, relationships within specific groups, and other topics. Their title confirms that they accept the prevailing hypothesis that Neornithes (modern birds, the most recent common ancestor of living birds and all its descendants) are a clade of maniraptoran theropod dinosaurs that survived the Cretaceous–Paleogene (K–Pg) extinction event 65 my ago. In their preface they acknowledge that neither morphological nor molecular approaches have so far produced a widely accepted tree of the relationships among the major groups of living birds. For fossils, of course, only morphological approaches are available. As in other recent edited books emphasizing avian paleontology [1–3], uncertainties associated with the theropod origin of birds are either omitted or dismissed, but many chapters are unaffected by these uncertainties.

The book is organized into four parts: the deep evolutionary history of modern birds (before the K–Pg event), fossils and the avian tree of life for modern birds, the evolution of key avian attributes, and conservation and climate change. Three previous reviews are entirely positive [4–6], but the review by Campbell [7] praises some chapters and criticizes others.

In Part 1, Makovicky and Zanno set the stage for the rest of the volume. Their figure 1.1 is a ladderized tree showing key traits in avian evolution mapped stepwise onto a phylogenetic tree for Archosauria. The accompanying *Archeopteryx* is portrayed like a walking chicken. James and Pourtless [8] are misquoted here (p. 40) and in Chapter 3 as having placed Aves outside of dinosaurs. That paper actually contends that the origin of birds is currently ambiguous, that one can reliably evaluate a hypothesis without proposing an alternative, and that many cladistic analyses claimed to have tested the theropod origin of birds are flawed. New discoveries provide increasing evidence that at least three current groups of theropods (Dromaeosauridae, Troodontidae, Oviraptorosauria; those with vaned feathers) might be birds, more derived than basal birds, as has been argued since 1988 by Gregory Paul, who nevertheless holds that birds are theropods. Read this chapter as a detailed summary of the "consensus" view. Then read Paul [9] and Feduccia [10,11] for alternative views and ponder about whether you accept that the principle of congruence can identify homologous characters. In the second chapter, Ward and Berner point out that estimated low atmospheric oxygen levels in the Late Triassic may have favoured the evolution of bipedal dinosaurs. High oxygen levels in the Cretaceous were associated with high numbers of dinosaur genera. O'Connor et al. present an important summary of Mesozoic (premodern) birds, demonstrating that various lineages acquired traits (reduced postorbital bone, reductions in the manus, flightlessness) that we usually associate with Neornithes. Their cladistic analysis does not include Bremer support or bootstrap values.

Part 2 begins with a discussion by Livezey about persistent problems with both morphological and molecular approaches to phylogenetic analysis. He pleads for a future total-evidence approach that uses both. Dyke and Gardiner admit that the fossil record for modern bird lineages indicates that most of them originated after the K–Pg extinction. Their most extreme early limit of confidence is for Procellariiformes, at 76 my ago, and they predict that numerous Cretaceous neornithine fossils will soon be found. In a summary of the morphology and biology of fossil and extant penguins, Ksepka and Ando confirm that the sister group of the Sphenisciformes is Procellariiformes. For crown group taxa (Spheniscidae), the basalmost genus differs according to the rooting used. Alvrenga et al.

summarize information about the extinct flightless Phorusrhacidae, the terror birds that inhabited South America from the Paleocene until the end of the Pleistocene. Similarly, Bourdon summarizes information about the extinct Odontopterygiformes, the pseudotoothed seabirds of the Paleocene to Pliocene, some of which were twice the size of the largest extant albatrosses. Her analysis places the group as the sister group to the Anseriformes. After pointing out that the osteological synapomorphies of the Galloanserae are entirely cranial, she offers a sobering wake-up call to her colleagues studying early neornithine evolution (pp. 218–220). Barker's chapter about the Passeriformes, one of the most notable radiations of vertebrates remaining on the planet, compares studies of biogeography and patterns of diversification based largely on molecular data and ends on an optimistic note.

Part 3 is a mixture of papers on functional morphology, comparative morphology, and phylogenetic inferences from molecular data. First, Tobalske et al. address morphological and behavioural correlates of flapping flight, contending that they have a testable model for the origin of flight based on the development of precocial birds. Walsh and Milner describe the modern avian brain and compare micro X-ray computer tomography of fossil endocasts. Avian brains were almost modern in size and morphology by 55 my ago, and even the brain of the oldest fossil bird, *Archaeopteryx*, shows that it was well equipped for flight (although why a flightless theropod would have a bird-like expanded telencephalon and cerebellum is unknown). Brown and Van Tuinen address the contentious issue of the disparity between molecular and fossil evidence about the antiquity of the modern avian phylogenetic tree. They anticipate further development of Bayesian relaxed-clock models that use both and admit that a reliable phylochronological signal is not yet available. The most recent example is Jarvis et al. [12], who found a strong molecular signal for the radiation of Neornithes that is post the K–Pg event. Organ and Edwards discuss major events in the evolution of the avian genome and variation in genome size and chromosome number in various taxa. Summarizing the results of molecular studies, Lindow concludes with some confidence that the division between the Paleognathae and Neognathae occurred about 100 my ago, that the origins of the Galliformes and Anseriformes occurred either together or separately 95–90 my ago, that the basal diversification of Neoaves was 75–65 my ago, and that the main diversification within Neoaves occurred 65–55 my ago. Nevertheless, only two fossils of Neornithes are widely recognized from the Mesozoic (*Vegavis* and *Teviornis*) and even those have been disputed. Kaiser's chapter on marine and aquatic birds compares various classifications and points out striking cases of convergence. Loons and grebes always come out together in morphological analyses.

Part 4, on avian conservation, extinction, and climate change, seems to be misplaced in this volume, but its single chapter by Thomas is a good introduction to the literature on these subjects.

I sympathize with Dyke and Kaiser, who wanted to bridge the gap between ornithology as the study of living birds and the paleontology/systematics community, but I must agree with Campbell[7] that the student should approach the book with a critical eye. While admitting many of the uncertainties about avian evolution, it has avoided the most important one of all. My personal view is that its first chapter falsely asserts that cladistics, as it has been applied to morphological data from fossils, has correctly settled the issue of the origin of birds.

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[7] CAMPBELL KE JR (2012) Book review (DYKE & KAISER: *Living dinosaurs. The evolutionary history of modern birds*). *Auk* 129:568–569

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NARANJEROS, REINAMORAS, CHINGOLOS Y LOICAS

DEL HOYO J, ELLIOTT A Y CHRISTIE D (eds) (2011) *Handbook of the birds of the world. Volume 16. Tanagers to New World blackbirds*. Lynx Edicions, Barcelona. 894 pp. ISBN 978-84-96553-78-1. Precio: • 212 (tapa dura)

"¡Lloren chicos, lloren!"… llegó el "último" tomo de los 16 que completan el plan modificado del *Handbook of the birds of the world*. Dos motivos justifican las comillas. El primero es que en un principio la serie concluía con el volumen 12, pero cerca de la mitad del camino los editores decidieron (no sin antes consultar) ampliar la obra a 16 volúmenes para poder incluir más información y más fotografías; ambos cambios acertados. El segundo es que un misterioso tomo 17 (no numerado como tal) con descripciones de especies nuevas y algunas actualizaciones taxonómicas también ha sido publicado hace poco [1], poniendo el definitivo broche final a este mega emprendimiento. Sea como sea, con el volumen 16 (*Tanagers to New World blackbirds*; aproximadamente traducible en argentino como "Tangarás a tordos") el "jandbuc" termina de pasar revista a la avifauna del planeta Tierra. Como siempre, las fotografías son espectaculares y la calidad de las ilustraciones variable: desde convincente a excelente según el ilustrador.

Zambulléndonos en los contenidos encontramos el "Foreword" de Anders Pape Møller sobre el cambio climático y las aves, en el que examina varias de las posibles consecuencias del cambio climático sobre la distribución y la ecología de las aves. El capítulo es una buena síntesis general de lo poco que se sabe al respecto y muestra la frecuente falta de solidez de los trabajos que intentan vincular cambios en las historias de vida de las aves asociándolos al cambio climático sin poner a prueba