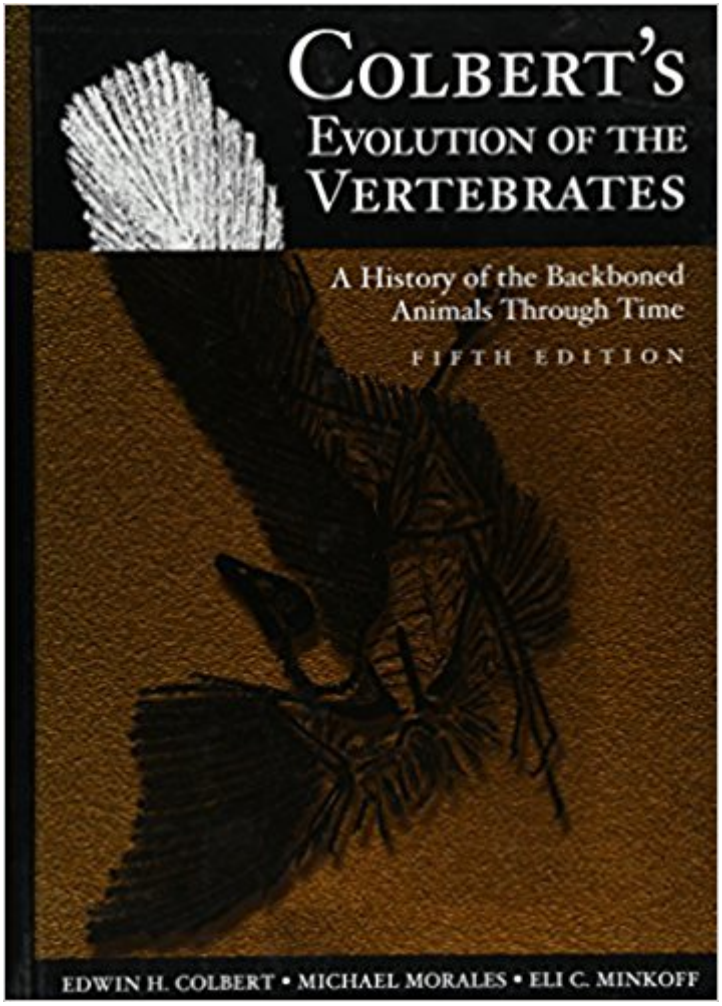
Colbert's Evolution Of The Vertebrates: A History Of The Backboned Animals Through Time



Synopsis

Vertebrate evolution is studied through comparative anatomy and functional morphology of existing vertebrates as well as fossil records. Since the publication of the previous edition of Colbert's Evolution of the Vertebrates: A History of the Backboned Animals Through Time, there have been significant advances in the knowledge surrounding backboned animals. This latest edition of the classic text is completely revised to offer the most recent discoveries in this continually evolving field of science. Covering the various aspects of vertebrate life, from skeletal system to ecology, behavior, and physiology, the Fifth Edition includes new sections on conodonts, dinosaurs, primates, and the origin of birds, and discusses: * Analysis of morphological and molecular data * Early diversification of vertebrates * The evolution of dinosaurs * The origin of mammals * Early ruling reptiles * Basic adaptation of ungulates Colbert's Evolution of the Vertebrates, Fifth Edition carries on its legacy as an invaluable reference for professionals in evolutionary biology and paleontology, as well as an ideal textbook for students in those fields.

Book Information

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Customer Reviews

"The book points out very cleary the climatic and geological conditions, and environment that allowed the various taxa of vertebrates to evolve and thrive. The clarity and insightfulness of the authors are highly recommended." (W.H. Tam, University of Western Ontario) "considered a classic" (New York Times, 25 November 2001) "An absolute must for readers with an interest in vertebrate evolution." (Northeastern Naturalist, Vol. 9, No. 2, 2002)

"Eminently readable and lavishly illustrated (with Lois Darling's classic drawings of reconstructed species plus up-to-date cladograms), Colbert's Evolution of the Vertebrates is the perfect book for students of vertebrate paleontology. Unlike encyclopedic reference texts which are full of confusing jargon, this is a book that can be read by the non-specialist. Colbert tells--and shows--the fascinating story of vertebrate evolution and diversity, with all of the major groups represented. With thorough yet uncluttered text and well-chosen figures, with complete coverage of paleoecology, stratigraphy, and taphonomy, this book is perfect for anyone who wishes to learn more about our "extended" family tree." (Alexander J. Werth, Ph.D., Hampden-Sydney College)

I knew and liked Ned Colbert, and loved the early editions of this once-classic book. He passed away on November 15, 2001, shortly after this edition appeared, so it makes it even more difficult to be honest and frank. But it is necessary, since this is a clear case of a publisher trying to push an outdated, badly conceived project on the market, and few but professional vertebrate paleontologists will realize how problematic this book has become. In its first edition (written in 1955), Colbert's Evolution of the Vertebrates was an excellent non-technical review of vertebrate evolution as it was known almost 50 years ago. The second (1969) edition and third (1980) edition began to become more and more outdated, since Colbert retired in the 1960s, and became less and less connected to the latest developments (both in discoveries and in philosophy) that had occurred in vertebrate paleontology. By the time of the fourth edition (published in 1991), the publisher brought in Mike Morales as a younger co-author, but it made no difference-the book was badly out of date in both its approach and its facts. Most of us hoped that this would be its last edition, since there was little that could be done to salvage it. But in this edition, they have added a third author, Eli Minkoff, a biologist who is not a vertebrate paleontologist and who clearly has not kept up with the important developments that have occurred in the past decades. Consequently, the book is full of errors of both omission and commission in every chapter, and should not have been published, let alone used by anyone to teach a modern course in fossil vertebrates. The problems are so numerous that I cannot list them all in a brief review, but I will mention a few of the more important ones here. It starts with the authors' ambivalence toward the cladistic revolution, which in the past 20 years has completely transformed the way we think about fossil vertebrates. In places, they attempt to be current by paying lip-service to cladograms, but their fundamentally old-fashioned philosophy is unchanged everywhere else. On page 16, they mention (but never explain) cladistics in one brief paragraph, and then throughout the book they place Colbert's 50-year-old diagrams

(with no resolution of phylogenetic relationships) side-by-side with a cladogram of some of the same taxa-or use one of the outdated diagrams with no attempt to show more recent hypotheses at all. Again and again, they make anachronistic statements suggesting that we can't know anything about phylogeny because of a lack of a suitable ancestor, or statements like "no clear indication of relationships among gnathostomous fishes can be determined from their stratigraphic order of occurrence in the rocks" (p. 48)-as if it ever could in a group with such a poor fossil record! Certainly, they have a right to disagree with the prevailing philosophy in their profession if they so choose, although they end up painting a very unrepresentative and inaccurate picture of what we have learned as a consequence. Even more disturbing is the clear evidence that none of the authors keep up with the new discoveries made in past 20 years. Certainly, I haven't seen any of them at the meetings of the Society of Vertebrate Paleontology during that time, and apparently they don't read the journals, either. It is jarring to read, page after page, statements, ideas, or taxonomic concepts that have become grossly outdated, and should have disappeared long ago. Among the numerous examples are: the discredited notion that jaws are derived from gill arches (p. 38); Romer's idea that tetrapods left the water to escape drying pools, or chase prey, when all the recent discoveries of Acanthostega show that the tetrapod limb appeared in fully aquatic animals long before there was any need to crawl out on land (p. 85); the idea that anthracosaurs like Seymouria had anything to do with amniote origins, when recent discoveries like Westlothiana (not even mentioned in this book) have shifted the focus elsewhere (p. 105); the failure to note (p. 154) that the latest fossils show that snakes are descended from mosasaurs; a grossly antiquated approach to Mesozoic mammals and their relationships in Chapter 19, with almost no mention of the last decade of amazing discoveries; a carnivore "phylogeny" (p. 379) that treats "Fissipedia" as a natural group, and fails to show that pinnipeds are clearly descended from bears, not from the carnivoran stem; no mention (p. 394) of Ambulocetus and all the other recent spectacular transitional whale discoveries (all published long before this book went to press); the outdated notion (p. 428) that protoceratids are related to tragulids, rather than camels; the idea that perissodactyls have anything to do with phenacodonts (p. 452), instead of the recent discoveries of Chinese taxa like Radinskya, which point in a whole new direction; the outdated idea (p. 467) that brontotheres survived the Eocene (thanks to revisions of the time scale completed a decade ago), or that chalicotheres dug up roots (p. 469) with their peculiar claws (debunked by Coombs 20 years ago); the complete failure to mention (p. 480) all the new primitive elephants like Numidotherium and Phosphatherium, which push proboscideans back to the Paleocene of North Africa. The list could go on and on, but these are among the more glaring examples of a failure to recognize or incorporate any of the past 20

years of discoveries. Equally jarring is the repeated use of taxa that were manifestly unnatural even in 1955, and have not been used by vertebrate paleontologists in many years. The examples are too numerous to mention, but it feels like going through a time warp to read about "chondrosteans," "holosteans," "labyrinthodonts," "thecodonts," "Prototheria," "eupantotheres," "condylarths," "palaeodonts," as if anyone still practicing vertebrate paleontology took those taxa seriously. Symptomatic of this problem is the use of the archaic term "mammal-like reptiles," a misnomer that reflects several serious misconceptions. Synapsids (the "mammal-like reptiles") and the true reptiles are two distinct lineages that originated separately and simultaneously in the mid-Carboniferous, so synapsids have never been members of, or descended from reptiles (in even the broadest sense of the word). Call them "protomammals" if you will-but they are not, and have never been, reptiles! These problems might not matter if this were just a trade book intended for the popular audience, who might not care if it is accurate or up-to-date in every detail. But I know of several institutions where paleontologists (not vertebrate paleontologists) still use this book to teach classes in vertebrate evolution, completely unaware of how grossly outdated this book had become. Nor is it the only choice on the market written at this level. Michael Benton's Vertebrate Paleontology (2nd edition, 2000, Blackwell) is fully up-to-date and much more affordable [...]. Clearly, the editors at Wiley-Liss are trying to extend their franchise long beyond its useful life, and instead of consulting with qualified vertebrate paleontologists who could have made the book up-to-date, they foisted this sad shadow of a former classic on the unsuspecting profession. Donald R. Prothero Department of Geology Occidental College Los Angeles, CA 90041 [....]

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I agree with Protero that this book is out-of-date. While I am not a paleontologist or even a biologist,

I’ve noticed several glaring errors, such as the continued use of the phylogenetically incorrect term "mammal-like reptiles" for basal synapsids and therapsids and the inexplicable lumping together of Nimravidae and Felidae (the author speaks as if the nimravids and true saber-toothed cats such as Smilodon were the same lineage). The book seems to have a lot of good information, but I’m not sure what content I can trust. Perhaps it would be helpful in combination with a couple other solid vertebrate paleontology books for cross-reference, but I cannot recommend it alone.

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