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# **Patterns And Processes Of Vertebrate Evolution (Cambridge Paleobiology Series)**



## Synopsis

This new text provides an integrated view of the forces that influence the patterns and rates of vertebrate evolution from the level of living populations and species to those that resulted in the origin of the major vertebrate groups. The evolutionary roles of behavior, development, continental drift, and mass extinctions are compared with the importance of variation and natural selection that were emphasized by Darwin. It is extensively illustrated, showing major transitions between fish and amphibians, dinosaurs and birds, and land mammals to whales. No book since Simpson's *Major Features of Evolution* has attempted such a broad study of the patterns and forces of evolutionary change. Undergraduate students taking a general or advanced course on evolution, and graduate students and professionals in evolutionary biology and paleontology will find the book of great interest.

## Book Information

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## Customer Reviews

"It is in my view the most important book in vertebrate evolution since Simpson's *Tempo and Mode in Evolution* (1944), because of what it offers as a summary, an integration, and above all a prospectus for vertebrate biologists of a new synthesis that is showing all signs of a very healthy infancy. Our next generation of scientists would do well to train themselves as Carroll has done in order to fulfill his vision of what integrative vertebrate biology can become." *Science* "Every now and again, a brave paleontologist stands back and looks over the collection for anything that links all the

tales together...Robert Carroll has broken new ground. He views the fossil record with the eyes of a biologist and a geologist...Not since 1953, when George Gaylord Simpson published *Major Features of Evolution* has there been such a well-founded overview of vertebrate fossils, their distribution in time and space, relationships with other organisms and with the environment..." *New Scientist*"Bob Carroll's latest book provides the first modern review of large scale patterns in the evolution of vertebrates viewed in the context of current evolutionary theory. A veritable tour de force...Carroll's book is well written and effectively illustrated...*Patterns and Processes of Vertebrate Evolution* will form an essential resource for all students of the evolution of vertebrates, but it can also be read with profit by anyone concerned with general issues of contemporary evolutionary biology." *American Paleontologist*"*Patterns and Processes of Vertebrate Evolution* is a masterful overview of evolution as it is understood by many vertebrate paleontologists and others today...Carroll writes clearly and rapidly-the whole is remarkably up to date, with meaningful incorporation of much current literature...this is a fine book." *The Society for the Study of Evolution*"...excellent review of the vast recent literature on development, particularly rewarding reading." *American Paleontologist*"Carroll's overview is welcome, well organized...and will prove to be a very useful backdrop to undergraduate courses on general evolution, or vertebrate history." *Geological Magazine*"The book covers a broad compass and the author provides accounts of the immense range of biological and geological topics. It is a useful addition to the literature on fossils and evolution." *Historical Biology*

This text provides an integrated view of the forces that influence the patterns and rates of vertebrate evolution from the level of living populations and species to those that resulted in the origin of the major vertebrate groups. No book since Simpson's *Major Features of Evolution* has attempted such a broad study of the patterns and forces of evolutionary change. The evolutionary roles of behavior, development, continental drift, and mass extinctions are compared with the importance of variation and natural selection that were emphasized by Darwin.

This reference starts off by noting problems in evolutionary theory, particularly that while short-term microevolution shows Darwinian characteristics, long-term macroevolution based on the fossil record does not, with species suddenly appearing and then persisting for long periods with few changes. Vertebrates are proposed as a model for studying evolution, noting that they are a monophyletic group, have sexual reproduction, share a similar body plan, and most importantly have an excellent fossil record. While the knowledgeable reader will find this reference interesting in

its integration of the forces affecting vertebrate evolution, the more general reader will find a variety of topics from fundamentals of population genetics to evolutionary development to the origins of major vertebrate groups, useful reading.

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