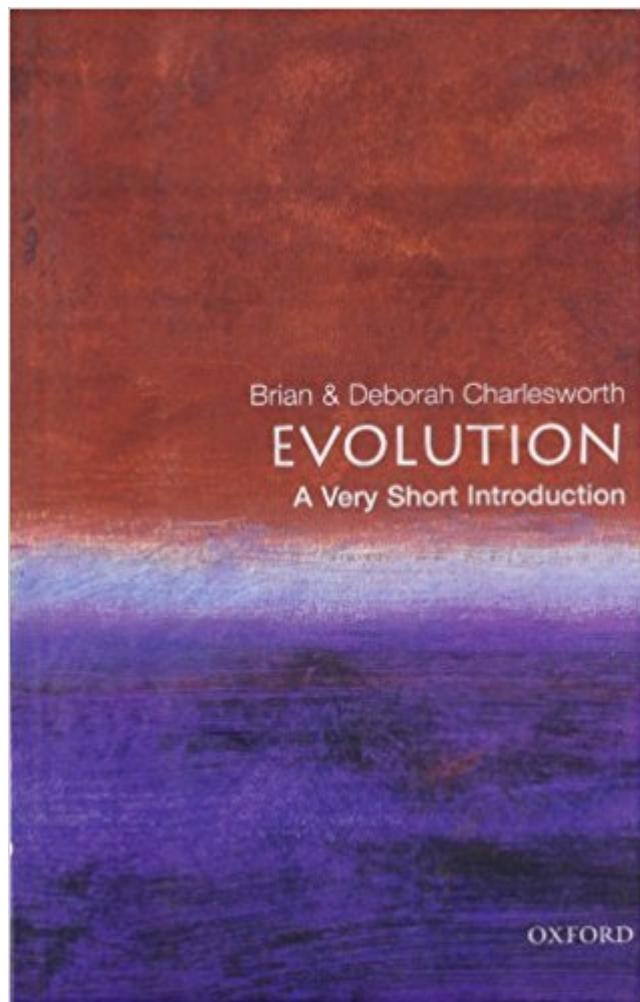


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# Evolution: A Very Short Introduction



## **Synopsis**

This book illuminates the crucial role of evolutionary biology in transforming our view of human origins and our relation to the universe, highlighting the impact of this theory on traditional philosophy and religion. The authors introduce the general reader to some of the most important basic findings, concepts, and procedures of evolutionary biology, as it has developed since the first publications of Darwin and Wallace on the subject, over 140 years ago. They show how evolution provides a unifying set of principles for the whole of biology and sheds light on the relation of human beings to the universe and each other.

## **Book Information**

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## **Customer Reviews**

Two distinguished biologists tell you what evolution is about, in a crystal-clear fashion. It's refreshing to read a clear, non-polemical account of the truth, which you rarely get in popular science writing. \*

Focus \* Evolution without the crap. \* Focus. \*

Brian Charlesworth is Royal Society Research Professor at the Institute of Cell, Animal and Population Biology, University of Edinburgh, and President of the Society for the Study of Evolution. His research is mainly in evolutionary genetics, applying classical and molecular genetics to the study of evolution and natural variation. He is author of *Evolution in Age-Structured Populations* (CUP, 2nd edn. 1994) Deborah Charlesworth is Professor in the ICABP at Edinburgh. Her research focuses on the evolution of plant breeding systems, including how they avoid inbreeding, and work on sex chromosomes and self-incompatibility.

An excellent review for the reader familiar with Evolution. Also a very good introduction for the novice.

Many scientific topics don't respond well to the short summary. They are too complex, or the history stretches too far to make it more than a breathless overview. Evolution, though, is an ideal topic for this approach because the concept itself is breathtakingly simple - the most amazing thing about evolution is that it took so long for someone to think of it - and being a relatively modern concept there isn't that much history to include. In fact, though key characters are referred to, this book largely concentrates on the technical stuff, losing out a little on the human side that is so important to popular science. "Evolution: A Very Short Introduction" gives a short summary of what the processes of evolution are before going on to look at the overwhelming evidence for evolution in the similarities (and variations) in different species, and in the way that the passage through time and space can be used to track back through an evolutionary tree. The Charlesworths give us a quick summary of adaptation and natural selection and on that sometimes thorny point the formation of species. Finally they take us through some of those well-rehearsed difficulties with evolution. It's surprising people are still coming up with objections like "how could you evolve an eye, because the in-between stages (a partial eye) are useless" when there are so many examples in nature of partial eyes - but the objections do still keep coming, in part because the objections to evolution are not always rational, and they are suitably demolished here. The authors are best when they stick to biology. In the introduction there's a sweeping statement that "Less than 450 years ago, all European scholars believed that the Earth was at the center of a universe of at most a few million miles in extent." This is simply wrong. Admittedly no one grasped quite what was going on with the universe, but it is incorrect to suggest that people thought it was that small -- the concept is based on anti-Christian propaganda originated towards the end of the 19th century (from the same source as the suggestion that in medieval times they thought the world was flat, also untrue). In fact Archimedes, in "The Sand Reckoner", estimated the size of the universe as 1,800 million kilometers across, and many proto-scientists, gave serious consideration to the universe being infinite. Luckily, though, this was just a bit of poor context setting in the introduction -- the main thrust of the book is fine. It's not a great read, but sets out the essentials in a clear, effective way.

Not as interesting as I thought it would be. Probably my tiny mind

"Evolution: A Very Short Introduction" (2003) by Brian and Deborah Charlesworth offers a concise, detailed introduction to evolutionary biology. The Charlesworths are both Professors at the University of Edinburgh. Brian Charlesworth is former President of the Society for the Study of Evolution while Deborah Charlesworth has served as President of the European Society of Evolutionary Biology. The Charlesworths offer the following introduction to this overview of evolution. "The relentless application of the scientific method of inference from experiment and observation, without reference to religious or government authority, has completely transformed our view of our origins and relation to the universe in less than 500 years. In addition to the intrinsic fascination of the view of the world opened up by science, this has had an enormous impact on philosophy and religion. The findings of science imply that humans are the product of impersonal forces, and that the habitable world forms a minute part of a universe of immense size and duration. Whatever the religious or philosophical beliefs of individual scientists, the whole programme of scientific research is founded on an assumption that the universe can be understood on such a basis." Evolutionary theory still provokes controversy. The Charlesworths do not hide their view that evolutionary theory is inconsistent with the position of supernatural, intentional creation of separate species. At several points in this introduction, they criticize supernatural creationism directly. Throughout the book, they gather the support for evolution from various strands of science and argue that it is overwhelming. The Charlesworths begin with a chapter explaining the nature of evolutionary biology drawn from Charles Darwin and Alfred Wallace. Then, in two chapters, they offer corroboration for the theory from two separate strands. In the first, the Charlesworths consider similarities and differences between organisms as showing evolution. The most interesting discussion in this chapter considers findings in cell biology and biochemistry. The study of heredity and of the nature of DNA across all forms of life corroborates and expands evolutionary biology in ways not available to Darwin and Wallace. In their second chapter setting out evidence for evolution, the Charlesworths examine "patterns in time and space", a form of evidence on which both Darwin and Wallace relied. This source of evolutionary theory is based upon the enormous scope of geological time together with the fossil record. Further studies since Darwin and Wallace, including advances in cell biology and dating techniques have served to corroborate and strengthen the early findings. In the following portions of their study, the Charlesworths discuss how evolution and natural selection explain the adaptation of species to their environment. They describe how evolution accounts for the astonishing diversity and change in living species, and they conclude with a short chapter on difficult problems in evolution, such as accounting for complex organs including, for example, the human eye. The Charlesworth's study is short but dense. It requires close, careful

reading, particularly in the sections involving cell biology. The book offers as a reward for the required effort a renewed understanding for the lay reader of evolution, its basis and importance. In my own case, I studied evolution in school many years ago but found it useful to focus upon it through this book. The Charlesworths' study will also be useful to students coming to evolutionary biology early in their lives. The book includes a brief bibliography for further reading. I have found the Very Short Introduction Series of Oxford University Press highly useful in exploring a broad range of subjects. I have especially benefitted from books in the series about the sciences in that I have tended to take the sciences for granted though adult life. This study of evolution fits well with other works in the series I have read, including various books about geology, chemistry, and the relationship between science and religion. Readers wanting an informed brief account of evolutionary biology will benefit from the Charlesworth's Very Short Introduction. Robin Friedman

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