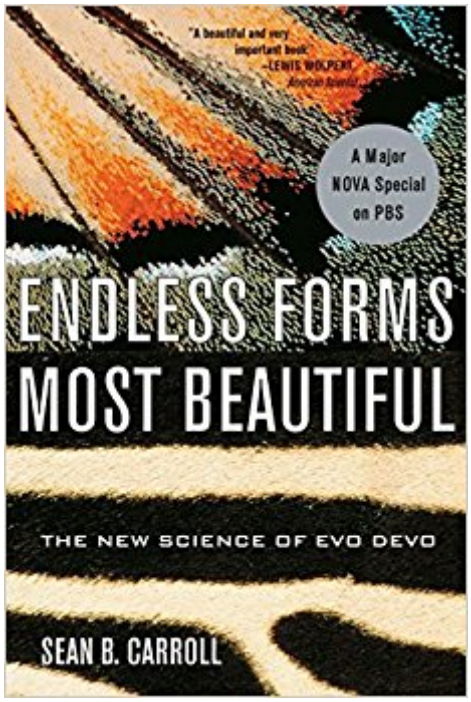
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Endless Forms Most Beautiful: The New Science Of Evo Devo



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Synopsis

Ã¢â ¬Å“A beautiful and very important book.Ã¢â ¬Â•Ã¢â ¬â ¢Lewis Wolpert, American Scientist For over a century, opening the black box of embryonic development was the holy grail of biology. Evo DevoÃ¢â ¬â ¢Evolutionary Developmental BiologyÃ¢â ¬â ¢is the new science that has finally cracked open the box. Within the pages of his rich and riveting book, Sean B. Carroll explains how we are discovering that complex life is ironically much simpler than anyone ever expected.

Book Information

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Customer Reviews

"Every animal form is the product of two processes--development from an egg and evolution from its ancestors," writes Sean B. Carroll in his introduction to Endless Forms Most Beautiful. The new science of "evo devo"--or evolutionary developmental biology--examines the relationships between those two processes, embryonic development and evolutionary changes, despite their radically different time scales. Carroll first offers a recap of how genes express themselves in a growing embryo, then peers into the life histories of real-life examples to explain how those genes have changed (or not changed) over millions of years of evolution. Paraphrasing Thomas Huxley, he asks us to consider evolution and development as two sides of the same coin. We may marvel at the process of an egg becoming an adult, but we accept it as an everyday fact. It is merely then a lack of imagination to fail to grasp how changes in this process that assimilated over long periods of time, far longer than the span of human experience, shape life's diversity." The book's second half is where Carroll really gets at the meat of evo devo, explaining how regulatory genes control such

mysteries as individual and population changes in butterfly’s spots, jaguar fur, and hominid skulls. Evo devo is one of the hottest areas of study in 21st-century biology, and Carroll’s outline of the field is a great place to start understanding it. --Therese Littleton --This text refers to an alternate Paperback edition.

Cobb County textbook stickers aside, evolutionary natural selection offers a pretty straightforward explanation for the forward march of species through history; a mutation that better equips a given organism to survive is passed along to its heirs, becoming more common as successive generations flourish. The actual process by which mutations happen, however, was far more mysterious until scientists turned to the study of evolutionary development (known by the somewhat unfortunate moniker "Evo Devo"). One such scientist is Carroll, a genetics professor at the University of WisconsinÃ¢â ¬â œMadison, who guides us along the broad contours of development ("the process through which a single-celled egg gives rise to a complex, multibillion-celled animal") and the ways in which its study sheds light on the underlying mechanisms of evolution. He explains in concrete terms how small changes in a species’s genetic code of a given species can lead to dramatic differences in physiology is the "missing piece" of evolutionary theory, Carroll argues. The book is as much a salvo in the continuing battles between creationists and evolutionists as it is a popularization of science, and Carroll combines clear writing with the deep knowledge gained from a lifetime of genetics research, first laying out the principles of evolutionary development and then showing us how they can explain both the progression of species in the fossil record and outliers like a six-fingered baseball pitcher. (Apr.) Copyright Ã Â© Reed Business Information, a division of Reed Elsevier Inc. All rights reserved. --This text refers to an alternate Paperback edition.

The Modern Synthesis in evolutionary biology has since its conception in the 1930s through the 1950s expanded to include ever-growing fields from all corner of academia, not just biology. The conceptual developments that folded the Modern Synthesis lead to revolutions in psychology, medicine, sociology, econimcs, engineering, langauge and others by bringing aboard evoltuonary thought.In this book by one of the leading experts in the field of evolutionary developomental biology or evo-devo readers are guided through the basics in the first part of the book, while in the second the concepts explained in the first part are used to shed light on many examples of changes in gene expression in the animal kingdom.The book takes a grand view of animal design and how it got that way, the author sets out to answer four fundamental questions (pp. 35): 1. What are some of the major "rules" for generating animal form? 2. How is the species-specific information for building a

pariticular animal decoded? 3. How does diversity evolve? 4. What explains large-scale trends in evolution, such as the change in number and function of repeated parts?The first part explains the tool kit of an (evolutionary) developmental biologist and these phenomenon influence gene expression, regulation of genes, and the developmental processes. The second part of the book begins with a grand view of animal design, and the broad lineages of animals-the proteurostomes and deuterostomes-and how hox genes have been monumental for the origin of diversity for these groups. The rest is small-scale changes of carefully selected examples in the animal kingdom, including examples from our own species.The last chapter is important because it points out three crucial things: (1) a cry for a "more" Modern Synthesis and the importance of developmental in evolutionary history, (2) the hinderance of teaching evolutionary theory in many Western countries, including (4) the USA where Creationism and Intelligent Design lobbied by fundamentalist Christians stand in the way of a decent education in biology (including evolutionary theory).Read the book, and be amazed by the power of evolutionary thinking in developomental biology, and enjoy the neat photos in the two color-plate sections and the lavish illustrations throughout the book.For the record this is not the only book of Sean Carroll he has written two other great popular science books as well, The Making of the Fittest and Remarkable Creatures (in addition to a few others, and a textbook) worth reading. Those who wants to know more about the author go and look at his website. On Youtube several videos there features him, there’s even a one-hour presentation of this book (with the same name as the book).

I can’t say I personally had many negative things to say about this book. First of all I think this might be my favorite science author to date. For one you can feel his excitement for the material on every page. I greatly share his sense of enthusiasm for the material, something that is often lacking for many science books. Some people find or feel that science ought to be or is a dry subject, so it’s always refreshing to read someone who entirely disagrees. Moreover, aside from the last chapter Sean Carroll also largely avoids mentioning creationism, which for me is a pet peeve in science books. I could write the entirity of this review about how many times I’ve rolled my eyes while reading a credible scientist who can’t help but vent frustrations about creationist this and creationism that. Sadly evolution defines itself by it’s controversies as much as it does it’s accomplishments. This book spends most of it’s time on the latter.The chapters are written very well, with clear introductions, informative main sections and thorough conclusions. It definitely hits you with a lot of information, much of it very technical, so it’s good to have a firm grasp of evolution before picking this up. You will find yourself keeping up with a lot of jargon such as Distal-less and

homeotic. I was fortunate to have read up on genetics prior to buying this book, however often I reread sections and paragraphs just to make sure I understood them. Again, be prepared.The downside of this book is it’s not a book of answers, but a book that raises plenty of engaging questions. I feel the purpose of good science literature is to make you think more deeply about your surroundings. In that regard the book is a phenomenal accomplishment. I caution buyers though; if you simply want to get a basic primer that doesn’t require or encourage further investigation and reading this book is not for you. If you are ready to scratch beneath the surface and want to understand more of the details this book is absolutely for you.One other point of criticism directed at the author is that in the openning chapter he tells a story about how an evolution professor (presumeably someone who doesn’t study embryology) asked how you’d construct a chicken after it’s embryo had been put through a blender. The implication is that despite the genetic components theoretically being intact, they will never result in a chicken. The problem is Carroll never satisfies this professor’s critique. I imagine I would simply say "why not?" but that’s hardly an answer. It does seem as though the science of Evo Devo is an exercise is tediously studying genes and may not answer as many questions as the author presumes it does, that said, it’s clearly important when accompanied by all the other evidence we have. Unfortunately spending all your time on genes doesn’t really offer any perspective on the world and environmental factors which shaped them, so you as a reader are left to surmise this for yourself.Bottom line is I highly reccommend this book, but I also reccommend you not make it your first and CERTAINLY not your last book on evolution and or genetics.

This is an amazing book written in plain English but with a depth of scientific knowledge you often don’t get in many "popular science" books. He does a beautiful job of explaining how evolution has built complex organisms, including humans, from the simplest subset of genes that he refers to as the "Toolkit". These foundational genes, made to act in numerous ways by "switches" located further up the strand of DNA, build all the beauty and wonder you see in the world today. Truly a fascinating book and a must read for anyone interested in the biological sciences!

The title is well suited. One of the most beautiful books I have ever read. The way I see life Form/s has changed and my appreciation and love of our (all life) incredible journey makes me feel like my FOXP2 was damaged- I am mostly speechless.

I love "Endless Forms Most Beautiful". I never thought that in my lifetime I would see in such detail,

how bodies are made from a single-celled embryo to many-celled animal.It was working with simple fruit flies that helped to uncover how the building blocks for all animals are put together.You may have to read the book more than once to get a firm understanding of the body plan, the timing of switches, and the decoding of the DNA. I hope you get a lot of pleasure from reading and understanding the book.

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