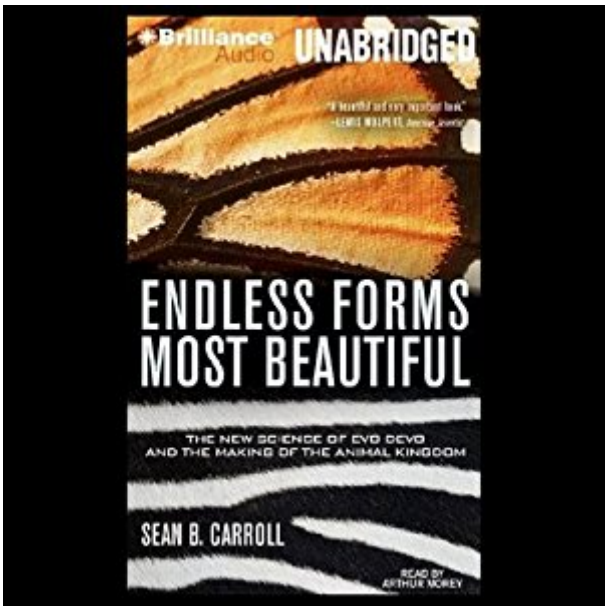
Endless Forms Most Beautiful: The New Science Of Evo Devo And The Making Of The Animal Kingdom



Synopsis

For over a century, opening the black box of embryonic development was the holy grail of biology. Evo Devo -- Evolutionary Developmental Biology -- 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. Perhaps the most surprising finding of Evo Devo is the discovery that a small number of primitive genes led to the formation of fundamental organs and appendages "in all animal forms." The gene that causes humans to form arms and legs is the same gene that causes birds and insects to form wings, and fish to form fins; similarly, one ancient gene has led to the creation of eyes across the animal kingdom. Changes in the way this ancient tool kit of genes is used have created all the diversity that surrounds us. Sean Carroll is the ideal author to lead the curious on this intellectual adventure -- he is the acknowledged leader of the field, and his seminal discoveries have been featured in Time and The New York Times. --This text refers to the Paperback edition.

Book Information

Audible Audio Edition
Listening Length: 8 hoursÂ andÂ 31 minutes
Program Type: Audiobook
Version: Unabridged
Publisher: Brilliance Audio
Audible.com Release Date: June 25, 2009
Language: English
ASIN: B002ER24X8
Best Sellers Rank: #147 inÂ Books > Science & Math > Biological Sciences > Biology > Developmental Biology #616 inÂ Books > Audible Audiobooks > Nonfiction > Reference #777 inÂ Books > Medical Books > Basic Sciences > Genetics

Customer Reviews

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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