

## **The Annotated Origin: A Facsimile of the First Edition of On the Origin of Species**

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Source: BioScience, 59(10) : 904-905

Published By: American Institute of Biological Sciences

URL: <https://doi.org/10.1525/bio.2009.59.10.12>

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## Origins of the *Origin*

**The Annotated *Origin*: A Facsimile of the First Edition of *On the Origin of Species*.** Charles Darwin. Annotated by James T. Costa. Harvard University Press (Belknap), 2009. 576 pp., illus. \$35.00 (ISBN 9780674032811 cloth).

**T**he *Annotated Origin: A Facsimile of the First Edition of On the Origin of Species* should be on the shelf of every practitioner of the life sciences. James T. Costa, executive director of the Highlands Biological Station in Highlands, North Carolina, and professor of biology at Western Carolina University, has rendered a valuable service to the profession by making the single most influential work in the history of biology both accessible and relevant to modern readers. Costa is aware that most students of biological science have at best merely glanced at Darwin's great book, but certainly have never read it through. By making visible what he calls the breath-taking sweep of Darwin's method, he has made a compelling argument for taking a page from Darwin's playbook in making the case for biological evolution. He has also shown how Darwin models for us the best of the scientist's craft—close and thorough observation, careful reasoning, persuasive argumentation, staunch defense of ideas, and respectful treatment of opponents. Darwin has a lot to teach us.

Costa begins the book with an introduction that chronicles the background to *On the Origin of Species*, focusing especially on the years just after the *Beagle*'s second voyage, which ended in 1836, and on the 1850s. He shows himself to be well versed in the development of Darwin's thought, a fact that becomes evident later in the book too, as Costa introduces the reader to the general strategy Darwin uses in his work. In the body of the book, he comments frequently and in much greater detail on specific strategies Darwin employed in

the course of developing his argument. The book's coda, in which Costa nicely lays out how the various editions of *On the Origin of Species* changed, is quite helpful. Once again, throughout the text itself Costa notes specific changes in the various editions as they bear on issues Darwin discusses. The reader can see how Darwin responded to critics, how he changed his mind, and when he decided more elaboration was called for.

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The idea for *The Annotated Origin* arose while Costa was a student of Stephen Jay Gould. Having heard Gould complain that few students or even professional biologists had ever read Darwin's masterpiece, Costa resolved to do something about it. The first result was a course on the original book, which the author has taught for well over a decade, in which students study the work and its historical context. And now comes this splendid volume, making us the beneficiaries of the annotator's long experience in teaching the course, plus his involvement in summer programs with other biologists and historians of science. The layout of *The Annotated Origin* is creative: Each page has two columns; the inside one is a facsimile of the text of the first edition of Darwin's book, and the outside column presents Costa's running commentary. Each comment—there can be several per column—is numbered, and the correspondingly numbered arrow points to the referenced text in *On the Origin of Species*.

Costa accomplishes a number of different tasks in his commentary. As one would expect, he plays the role of editor in supplying biographical material to identify people or works Darwin may have mentioned only in passing. For example, in chapter 4, Darwin refers to the assertions of a Mr. Pierce about two varieties of wolf in the Catskill Mountains. Costa identifies Pierce as well as the title of the memoir Darwin had read and the journal and year in which it appeared, noting that the existence of two varieties of wolf with different build, pursuing different kinds of prey, supports Darwin's claim that selection promotes divergence.

Another helpful role Costa often performs is to explain what Darwin meant. An illustration of this comes in chapter 9, where Darwin is trying to oppose the notion that whole groups of species—for example, mammals—suddenly came into being. In the course of his argument, Darwin refers to “one true mammal” that had been discovered at the beginning of the secondary geologic period, much earlier than the supposed sudden origin of mammals at the beginning of the tertiary. Costa explains that Darwin here refers to the so-called hand-animal discovered in southern Germany, explaining that today we believe it to be an ancestral reptilian relative of dinosaurs. He also lets us know that the 19th-century terms “secondary” and “tertiary” correspond to the modern classifications of Mesozoic and Cenozoic periods, respectively.

While Costa is always ready to supply insights from the 21st century to elucidate or clarify Darwin's points, he is careful not to make Darwin into more than the 19th-century naturalist that he was. He notes where modern biologists do not agree with Darwin—for example, on the role of the inheritance of acquired characteristics (to which Darwin ascribed a secondary role) and isolation. Costa's treatment of isolation whenever it comes up in *On the Origin*

doi:10.1525/bio.2009.59.10.12

of *Species* is extremely helpful in providing a balanced view of Darwin's position. He misses no opportunity to show that Darwin did not simply dismiss isolation outright, as is sometimes maintained; rather, his view changed over time, settling into a position that downplayed isolation in comparison with the production of new species in large continental areas.

If Costa is careful not to make Darwin into a 20th-century neo-Darwinian, there is one context that he does not acknowledge. Costa has an understandable opposition to modern anti-Darwinian agendas, especially those challenging the teaching of evolution in the schools. But Darwin on more than one occasion sounds more like an advocate than a critic of "intelligent design" (ID). Perhaps because Costa, like so many scientists, lumps ID together with creationism, he does not make the connection. But many ID advocates—though not all, to be sure—are content with Darwin's view when he suggested that his encounters with nature, including evolution by natural selection, led him to conclude that a higher intelligence had been involved. Perhaps the general expropriation of ID by fundamentalists has convinced Costa that all ID theorists share a political agenda that Darwin would not have condoned.

I appreciated in particular how Costa brought other Darwin works to bear on passages in *On the Origin of Species*. This was especially true with regard to *On Natural Selection*, the big species book that Darwin was working on when the arrival of Alfred Russel Wallace's famous letter spurred him to compose the "abstract" that became the book. Costa shows us the difference between the two works. In *On the Origin of Species*, for example, Darwin briefly illustrates the variability of birds' nesting habits, while in *On Natural Selection*, Costa informs us, Darwin gives 10 manuscript pages of examples. But Costa also draws on many other materials that shed light on passages, from published works before and after 1859 to Darwin's well-known notebooks to his voluminous correspondence.

I have but one complaint. The great usefulness of the volume clearly rests with Costa's annotations, which clarify, inform, and update, as well as explain Darwin's work in the context of the modern view. But, alas, there is no index to this valuable material. The only index in the book is the one Ernst Mayr composed when he edited the first edition of *On the Origin of Species* (Harvard University Press, 1964). This consists of Darwin's original index plus entries by Mayr that refer to modern evolutionary ideas. To his credit, Costa has italicized the entries that Mayr added to Darwin's, something not done in the 1964 edition. But it would have been so easy to add a separate index to the contents of his annotations, and that would have made the book much, much more useful. Costa did include a bibliography of works he consulted, and he also provided a section of biographical notes for individuals that Darwin mentioned. That there is no index to his own contributions, however, is a glaring deficiency.

As a historian, I might have expanded Costa's bibliography a little, and I have minor qualms with one or two of his claims, but in the main, Costa's efforts have yielded an enormously rewarding document. Darwin has sometimes been portrayed as a plodding scientist, a good observer whose second-rate status is masked by the pregnancy of the grand idea he stumbled upon. Costa's work is a wonderful refutation of this portrait. No one who follows Costa through *The Annotated Origin* can possibly doubt Darwin's exceptional stature. There is no better tribute he could have made for this celebration of Darwin's 200th birthday and the 150th anniversary of the publication of his masterpiece.

FREDERICK GREGORY

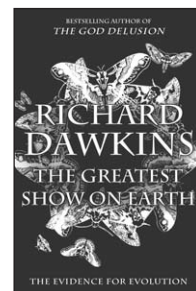
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## WHY DARWIN WAS RIGHT AND CREATIONISTS ARE WRONG

**The Greatest Show on Earth: The Evidence for Evolution.** Richard Dawkins. Free Press, 2009. 480 pp., illus. \$30.00 (ISBN 9781416594789 cloth).

Over the past three decades, biologists and then scientists more generally have become increasingly aware of the threat that creationism, in its many guises, poses not only to science but also to rationalism and evidence-based decision-making. The intention of "intelligent design" advocates, as revealed in the "wedge" document ([www.antievolution.org/features/wedge.pdf](http://www.antievolution.org/features/wedge.pdf)), was to replace evolution in science curricula and to recast the sciences generally in a theological framework (Forrest and Gross 2003). The conflict between evolutionary science and creationism is the front line in the defense of science.



The response to creationism (and its intelligent-design incarnation) has included several excellent books (e.g., Alters and Alters 2001, Pennock 2001, Pigliucci 2002, Scott 2009) and institutional statements (e.g., NAS 2008). However, most of these deal primarily with how to counter creationists and their arguments. Most books, except for one by Donald Prothero (2007) on the fossil record and my own effort published 26 years ago (Futuyma 1983), provide only bare-bones treatment of the positive evidence for evolution. But in this sesquicentennial anniversary of *On the Origin of Species*, two excellent books

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