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The Origin Then and Now: An Interpretive Guide to the Origin of Species

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TRANSLATED FROM THE *ORIGIN* (AL)

The *Origin* Then and Now: An Interpretive Guide to the *Origin of Species*. David N. Reznick. Princeton University Press, 2009. 480 pp., illus. $29.95 (ISBN 9780691129785 cloth).

Of the multitude of books on Darwin and evolution published in the 2009 anniversary year, I have been most excited by those focusing on Darwin's masterwork, *On the Origin of Species*. For a variety of reasons Darwin's book remains perhaps the least-read revolutionary book ever produced—certainly the least *understood* revolutionary book ever produced. Although the science of evolutionary biology has marched on, and our understanding of evolutionary processes, not to mention heredity, is fuller and more accurate in many respects than Darwin's, the *Origin* remains highly instructive. It can be read as a founding document of a thriving scientific field, a lucid example of Victorian-era scientific argument or literature, or as the articulation of a new worldview that marked the end of romanticism and the beginning of the modern period.

There have been innumerable reissues of *On the Origin of Species*, from print to audio to e-book editions (even one "Trojan horse" version, with its text presented with an introductory creationist screed explaining why it's all wrong), as well as a host of books explaining the original and its arguments. These include Janet Browne's concise "book biography" (Browne 2006); a wonderful graphic-arts adaptation (Keller 2009); my own annotated edition (Costa 2009); and—the subject of this review—David N. Reznick's fine interpretive guide, *The* Origin *Then and Now*.

Reznick, an evolutionary biologist and biology professor at the University of California, Riverside, studies population biology and life history evolution in *Poecilia* guppies. He takes the reader on a journey through the first edition of *On the Origin of Species*, offering clear accounts of Darwin's arguments, both in their historical context and from a more modern perspective. The book is introduced by distinguished philosopher of science Michael Ruse, of Florida State University, who provides a wonderful springboard into Reznick's treatment by giving a broad overview of Darwin's life and times, the genesis of his evolutionary thinking, and his strategy in pitching his argument in the *Origin*.



Reznick's "rewrite" of Darwin's *Origin* is not like those often-stillborn attempts to make classic texts—Shakespeare's, for example—"accessible" to modern readers by rewriting the original in contemporary language. Reznick does not try to be Darwin's modern voice; rather, he is a companionable guide to the issues Darwin tackled and the points he made. Although the structure of the original text is very much recognizable in *The* Origin *Then and Now*, Reznick does not confine himself to a literal chapter-by-chapter explication of Darwin's work. All of Darwin's chapters are there, to be sure, in mostly the same order and often with many of the original subsections, but there are important changes made in the spirit of explaining Darwin's method and intent. Some of *Origin*'s chapters are thus discussed out of sequence in Reznick's treatment, the content of two of Darwin's chapters ("Variation Under Nature" and "Natural Selection") is divided into two chapters each, and Reznick discusses geological and paleontological issues in four chapters to Darwin's two.

Darwin had two overarching goals in mind when he structured the *Origin* as he did. In essence he was seeking to make a compelling case for the fact of evolution (transmutation, in the parlance of the day), and to argue for natural selection as its primary mechanism. Reznick points out that it is useful to distinguish between Darwin's efforts to establish natural selection as mechanism per se versus those aimed at showing how natural selection causes the formation of new species. Accordingly, Reznick divides *The* Origin *Then and Now* into three parts: Part one, "Natural Selection," summarizes Darwin's arguments in *Origin* chapters I–V, which set up natural selection as a mechanism; part two, "Speciation," summarizes some of the material from *Origin* chapters II and IV, together with chapter VIII ("Hybridism"), bearing more directly on the formation of species. Part three, "Theory," discusses Darwin's argument that his model of evolution by natural selection can explain patterns seen in diverse areas of investigation, from instinct to the geological record to biogeography to embryology and structure.

Reznick suggests, rightly I think, that it is easy for modern readers to misunderstand Darwin's interrelated objectives and come away feeling that, on the one hand, insofar as the *Origin* seems to be primarily about natural selection, Darwin does not address the origin of species at all; on the other hand, they feel that the *Origin* conflates natural selection with evolution and speciation in general. Neither is a correct reading, and Reznick's approach to unweaving the threads of Darwin's arguments will make it easier for the uninitiated to follow each line of reasoning.

Each of these sections is headed by a "preamble" chapter and concludes with a chapter dedicated to modern perspectives on Darwin's arguments, often drawing on illuminating case studies. Readers should not expect a discussion of every point Darwin makes in the

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Origin—Reznick preserves the crucial elements of each chapter's arguments while passing over others perhaps less important, or redundant. He also does an admirable job presenting the historical aspects of Darwin's arguments through a modern take on these issues, though in places I would have liked a fuller discussion of points where Darwin missed the mark. For example, although Reznick nicely explains Darwin's "divergence of character" process, in my opinion he misses an opportunity to emphasize how Darwin's overreliance on this competition-driven model of divergence led him astray. This represents one of the important areas where modern evolutionary biologists would disagree with Darwin; his divergence of character model led him to downplay the role of isolation in speciation and embrace an essentially sympatric speciation model in continental areas, consistent with the observation that most species are found in continental areas (as opposed to islands), where competition is fiercest.

Reznick discusses how Darwin combined a Lyellian model of cyclical changes in land elevation to postulate periods where continental areas were broken up into archipelagoes, thereby incorporating isolation and allopatry into his model of species formation. But this fascinating aspect of Darwin's thinking is worth even deeper exploration, I think. Explicit discussion of isolation by Darwin came as late as 1869 in the *Origin*'s fifth edition, apparently prompted by criticism leveled by the German naturalist Moritz Wagner. Wagner wrote Darwin in 1868, arguing that isolation is necessary for the formation of new species—what Wagner called his "separation theory." Darwin cited Wagner in the fifth edition, but even then stated that he could "by no means agree with this naturalist, that migration and isolation are necessary for the formation of new species." Wagner was not satisfied, and proclaimed in books and articles that it was he and not Darwin who had discovered the true mechanism of the origin of species. Darwin was not amused. This episode, which also involved a related criticism by engineer Fleeming Jenkin, is one reason that Ernst Mayr criticized Darwin's divergence of character model and considered it a failed theory, which Reznick mentions in a somewhat different context. The full story is illuminating, and provides an opportunity to explore how and why biologists today differ with Darwin.

There are a few other areas where I felt that a fuller exploration and contrast with today's thinking would have been instructive, but this is a minor criticism. In all, I found Reznick's treatment of the relation of historical to current thinking deft and effective. We see this to especially good effect in the concluding two chapters of Reznick's book, the penultimate chapter treating Darwin's chapter, "Recapitulation and Conclusion" (which is entertainingly presented as a case argued before a jury), and the final chapter, in which Reznick expands upon the lines of evidence Darwin marshaled from diverse disciplines in the second half of the *Origin* (Darwin's consilience argument). Reznick looks to the pieces of the evidentiary puzzle that were missing or limited in Darwin's day and fills these gaps with an abundance of well-chosen examples that have come to light in the ensuing post-*Origin* century. The "eyewitnesses" then missing and now found include a detailed quantitative and empirical understanding of the action of natural selection, the speciation process, "deep time" and Earth processes, heredity, and the ever-growing panoply of transitional fossils. Reznick concludes this chapter with a discussion of human origins and evolution, a topic only hinted at in *Origin* itself but treated by Darwin 12 years later in *The Descent of Man*.

David Reznick succeeds in producing a highly engaging and informative "interpretive guide" to the original *On the Origin of Species* with an approach that will prove quite useful in different ways to different groups of readers. Those who have read Darwin but perhaps lack knowledge of contemporary evolutionary biology will find the case studies, examples, and discussion of modern context highly instructive; modern biologists will gain much insight into the state of evolutionary thinking at its genesis, à la Darwin. But as illuminating as Reznick's "translation" of Darwin's epochal work is in its own right, it is not a substitute for reading Darwin himself. Rather, this book should be viewed as an invitation. I join Resnick in hoping that his interpretive guide will inspire readers to pick up the *Origin* and enjoy Darwin with a whole new level of comprehension and appreciation.

JAMES T. COSTA

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LIFE, ILLUSTRATED

Evolution: The Story of Life. Douglas Palmer. University of California Press, 2009. 374 pp., illus. $39.95 (ISBN 9780520255111 cloth).

We have seen a flurry of books about evolution in the wake of 2009's Darwinian anniversary year, and *Evolution: The Story of Life* may be the last of the major tomes. The recent focus on Darwin and on evolution has presented a wonderful opportunity for scientists and educators to take these core ideas to the public, although it isn't clear whether the excitement of the Darwin celebrations has shifted

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