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# Darwin's Dice: The Idea of Chance in the Thought of Charles Darwin

Charles H. Pence

Louisiana State University, [cpence@lsu.edu](mailto:cpence@lsu.edu)

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## REVIEW

### *Darwin's Dice: The Idea of Chance in the Thought of Charles Darwin*

by Curtis Johnson

Oxford: Oxford University Press, 2015. 253 pages

reviewed by Charles H Pence

One of the most refreshing things about reading the work of Charles Darwin is his open acknowledgment of his own ignorance. Arguably, nowhere is this evidenced more than in his discussion of the variations or “individual differences” that form the raw material on which natural selection acts. At the beginning of the fifth chapter of *On the Origin of Species*, he writes that

I have hitherto sometimes spoken as if the variations—so common and multiform in organic beings under domestication, and in a lesser degree in those in a state of nature—had been due to chance. This, of course, is a wholly incorrect expression, but it serves to acknowledge plainly our ignorance of the cause of each particular variation. (Darwin 1859:131)

“Chance,” then, is for Darwin here just shorthand for “some sort of causes that I can’t begin to fully specify.” Of course, in the intervening century and a half, we have discovered many of these causes of variation, spanning our modern understanding of genetics, epigenetics, and so on. But such knowledge wouldn’t begin to form until the work of Gregor Mendel was rediscovered after Darwin’s death—and the debate over natural selection in the following years would result in the period that the historian Peter Bowler (following Julian Huxley) has described as the “eclipse of Darwinism” (Bowler 1992). From around 1880 to around 1930, many non-Darwinian theories of species change were actively pursued, and a motivation for many was the want of a theory of variation that could allow us to better support the mechanism of natural selection.

But chance meant far more than just this for Darwin. As deftly detailed in Curtis Johnson’s new book *Darwin’s Dice*, Darwin saw chance to be implicated throughout the natural world: in the “chance transport” of organisms from one location to another (hitching a ride, say, on an animal’s fur or a floating piece of bark); in the causes of individual variations; in the relationship between natural selection and the artificial selection of human breeders (an analogy important for the argument of the *Origin*); in the importance of the “Lamarckian” inheritance of characters by use or disuse (the idea that a blacksmith would have children with strong arms, which Darwin accepted); and even, as Darwin thought, in human free will and morality.

Given how many phenomena Darwin believed were illuminated by “chance,” it is perhaps entirely unsurprising that he meant a wide spectrum of different things by the word. To

take only a few representative examples, Darwin often means by “chance” that we do not know the causes or “laws” that govern a given outcome (as we saw above in his discussion of variation). He also uses “chance” to stand in for the probability of surviving the struggle for existence (in this sense, some organisms have a higher chance of leaving offspring), as well as for randomness with respect to future adaptive needs (variation is “chancy” in this sense, too, because it does not know ahead of time what kind of variation would improve an organism’s odds of success). “Chance” can even refer to the absence of a creative or designing power—this is the sense of chance powering Darwin’s “architect” metaphor, where he argues that we cannot reasonably believe that the stones which an architect happens (there’s the “chance”) to select from the base of a cliff to build an arch would have been knocked off from the cliff face by some intelligent designer *just for the sake of* the builder’s future arch.

Johnson offers us a skillful analysis of many purposes to which Darwin put the concept of “chance.” Further, to do so, he studies a vast array of Darwin’s own writings, ranging from his published works to his private notebooks and correspondence. The amount of material available about Darwin’s life and works exceeds that of most other thinkers, and the entire panoply is used to great effect here. The breadth of Johnson’s research is impressive, and is the book’s most alluring feature. Here we see Darwin, one of the finest scientific minds of the last few hundred years, struggling with what will be, for him, a central problem that recurs throughout his research, in everything from his private jottings to his finely honed public presentations. To cover all this ground in a book of reasonable length is a feat in and of itself, for which Johnson should be commended.

To be sure, historians and philosophers of biology will find details with which to quibble, as Johnson is not inclined to shy away from controversy. He argues for a provocative claim: that, beginning early in his career, Darwin recognized “chance” as one of the more herodox parts of his theory, and therefore worked to actively *suppress* its appearance in his writings over time, despite believing in it just the same. I’m skeptical that this argument succeeds—primarily because chance has so *many* meanings for Darwin that I find it unlikely that we could fruitfully discuss Darwin’s use of “chance” in general.

But setting these more abstruse disagreements aside, Johnson’s book is well written and admirably thorough. For those of *RNCSE*’s readers who have yet to explore Darwin’s writings at all, this may not be the right first work for you—it rapidly becomes technical, relying upon Johnson’s firm grasp of Darwin’s entire oeuvre. But if you have read one (or a few) of Darwin’s published books and would like a look inside Darwin’s mind, via the lens of his notebooks and correspondence, I heartily recommend this book. The concept of “chance” quickly takes us right to the heart of what makes Darwin such an interesting and important thinker, and Johnson shows us exactly why this is the case.

## REFERENCES

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**ABOUT THE AUTHOR**

Charles H Pence is Assistant Professor in the Department of Philosophy and Religious Studies at Louisiana State University, specializing in the philosophy and history of biology, and the application and ethics of contemporary technology.

**AUTHOR'S ADDRESS**

Charles H Pence  
Louisiana State University  
102 Coates Hall  
Baton Rouge LA 70803  
charles@charlespence.net



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