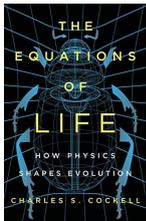


***The Equations of Life: How Physics Shapes Evolution* by Charles S. Cockell**
978-1541617599



Charles S. Cockell's *The Equations of Life* does a phenomenal job of presenting evolution from a new perspective. Cockell, an astrobiologist at the University of Edinburgh, states in the short preface, "This book explores one line of thinking that tries to make sense of diverse areas of science that straddle the living and the nonliving, the indefeasible links between physics and evolutionary biology." *The Equations of Life* does just that, and does it quite well.

Without getting overly bogged down in minutiae, Cockell explores the building blocks of life on Earth—DNA, water, and carbon, to name a few of the better known ones—and details how they work on a physical level. For example, he explicates why having two hydrogens and an oxygen in a water molecule actually matters in terms of evolution and life on Earth. At the conclusion of the book, Cockell briefly extrapolates how life might or might not evolve on other planets, based on how it has evolved here and why it has evolved that way and not another.

Perhaps one of the best and most illustrative investigations involves the lesser mole-rat, *Nannospalax leucodon*. The first page of the book immediately following the table of contents features a black and white photograph of this creature, with the caption $P = F / A$. You might recognize this from a high school physics class, or even a middle school one: pressure equals force divided by area. But what does this have to do with the lesser mole-rat, you might ask? You'll have to read Cockell's book to find out—I don't want to spoil it for you.

One minor refreshing detail in Cockell's chapter on DNA involves Rosalind Franklin, a brilliant crystallographer whose work helped Watson and Crick model the molecular structure of DNA. Cockell gives credit where it is due: "When James Watson and Francis Crick, with inspiration from X-ray images made by Rosalind Franklin, proposed a structure of DNA, a monumental step forward was made in deducing the centerpiece of life."

Due credit is something Franklin was denied in her own time and in Watson's autobiographical retelling of history, *The Double Helix*. Even though Brenda Maddox's *Rosalind Franklin: The Dark Lady of DNA* came out 15 years ago, and Franklin's contributions to the discovery of DNA have been made better known in the years since her death, some authors still neglect to mention her when the subject of DNA as it pertains to Watson and Crick surfaces in their work. So, it's always a refreshing and positive moment when an author like Cockell gives Franklin her due.

Despite its seemingly complex subject matter, *The Equations of Life* feels like a highly informative beach read in the best possible way. I could not put it down—Cockell's prose is engaging and fun—a perfect introduction to the fundamental connections between physics and evolutionary biology.

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