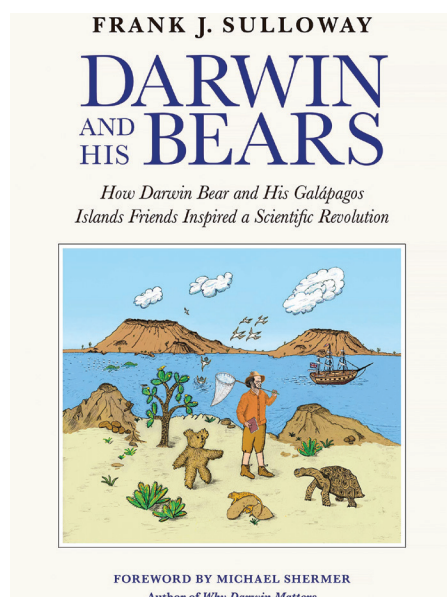


BOOK REVIEW

KIRSTIN MILKS & FRANK BROWN CLOUD, DEPARTMENT EDITORS

Darwin and His Bears: How Darwin Bear and His Galápagos Islands Friends Inspired a Scientific Revolution. By Frank J. Sulloway. 2021. Blast Books. (ISBN 9780922233519). 192 pp.



It is not generally known that when the Beagle departed the Galápagos on October 20, 1835, no fewer than sixteen diminutive natives of the islands were aboard, having befriended the young naturalist Charles Darwin. Renaming themselves after figures important in Darwin's life, such as the embryologist Karl Ernst von Baer, the sixteen lived and worked with Darwin, even aiding him in the composition of his books. Extraordinarily long-lived, they eventually relocated to the United States, where they

corresponded with the Harvard biologists Stephen Jay Gould, Ernst Mayr, and E. O. Wilson. They later returned to the Galápagos, where they are currently engaged in local conservation efforts.

Such, at any rate, is the premise of Frank J. Sulloway's *Darwin and His Bears*—and yes, the sixteen passengers, including Karl Ernst von Bear, are the bears of the title. Sulloway explains that the book began as a birthday present for a godson over 30 years ago and then “evolved ... into a didactic fantasy” (p. 169). Familiar elements of children's fiction are retained: the bears are gluttons (although for berries and bananas rather than honey and marmalade), sing amusing ditties, and engage in silly pastimes such as tortoise racing. But they are not clearly individuated (except in Appendix 1, which lists their habits, talents, and islands), and their ursine doings are not really the focus of the book.

Instead, the bears provide the basis for Sulloway to recount pivotal episodes in Darwin's career. A historian of science with important work on Darwin's research in the Galápagos to his credit, he is a trustworthy guide in general. But his attempts to lever the bears into historical importance—suggesting, for example, that it was a bear who recommended Thomas Malthus's essay on population to Darwin—are neither striking nor memorable. Chapter 7—in which a bear, intoxicated by gobbling berries sent to Darwin by Ernst Haeckel (hence *haeckleberries*), anticipates Freudian psychoanalysis—is self-indulgent: Sulloway is also the author of the pioneering study *Freud, Biologist of the Mind* (1979).

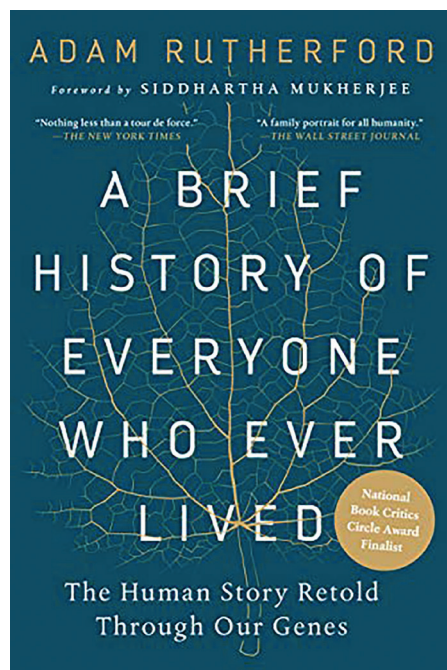
The bears similarly provide the basis for Sulloway to describe the central results of the work of Darwin and the biologists at Harvard. The diversity of the bears across the Galápagos, for example, is explained in terms of “maternal berry selection and survival of the fittest” (p. 40). Later, a phylogenetic tree of bears is presented, which includes Pooh and Paddington as well as Darwin's bears (in the “Smart Bears” clade): but where are Corduroy, the Berenstain Bears, Baloo, Rupert Bear, Larry, Irving, and Muktuk, to say nothing of the panserbjørn Iorek Byrnison? Unfortunately, in the later chapters, the jokes sometimes presuppose knowledge of the details of the scientific work that not all readers will possess.

Darwin and His Bears was clearly a labor of love for Sulloway, who even prepared the abundant full-color illustrations himself. But it is likely to appeal primarily to people who are both already knowledgeable about the history and the science of evolution and have a taste for the type of humor, often forced, on display—a limitation shared with a comparably playful book by the late historian of science John C. Greene, *The Wonderful Adventures of Nat Selleck & Eva Lou Shinn in Sci Fi Land* (2007). Those in search of a humorous but accurate treatment of evolution suited for young readers will do better to look elsewhere, starting with Jay Hosler's superb *Evolution: The Story of Life on Earth* (2011).

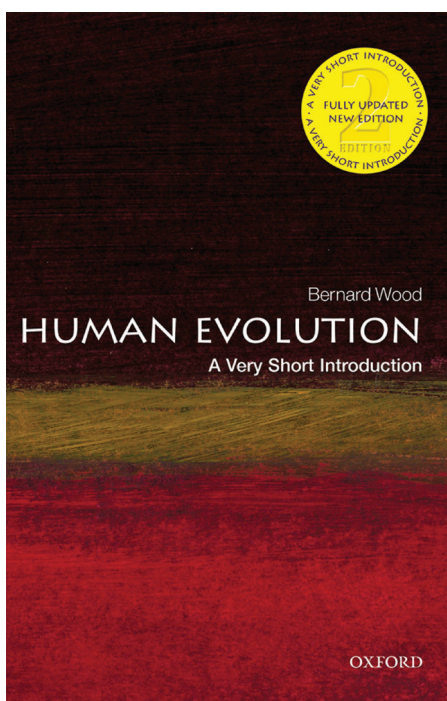


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A Brief History of Everyone Who Ever Lived: The Human Story Retold Through Our Genes. By Adam Rutherford. 2017. *The Experiment*. (ISBN 9781615194049). 416 pp.



Human Evolution: A Very Short Introduction, 2nd edition. By Bernard Wood. 2019. Oxford University Press. (ISBN 9780198831747). 160 pp.



Many people are excited to learn about human evolution, but it's a fraught subject. Although most people's notion of "race" is divorced from biologically meaningful statements about human evolution or contemporary genetic diversity, discussions of how our species arose often feel as though they might suddenly veer into a celebration of some humans over others.

I'm particularly sensitive to this because I occasionally teach about human evolution during classes in my local county jail (which is about half an hour's drive south of a rumored former headquarters of the KKK). Due to historical injustices in the United States, there's a lot of racial tension in incarceration settings, and I have to be careful that a little learning doesn't exacerbate that tension.

So my preference is that books about human evolution aren't simply "not racist" but rather actively antiracist. I appreciate when authors confront fraught topics directly, using sensitive language, and work to correct common misconceptions.

By way of example, consider the evolution of human skin color, which underlies most people's biologically inaccurate notions of race. In all the books under consideration in this review, and indeed throughout the scientific literature, there's the assertion that light skin was under positive selection at nonequatorial latitudes because lighter skin enhances vitamin D synthesis (e.g. Jablonski & Chaplin, 2000). This statement seems so uncontroversial! And yet, even this simple statement is based on strong Eurocentric assumptions about what sort of environment is normal.

During human evolution, people migrating into France, Mongolia, and Patagonia were all transitioning from equatorial regions to comparable latitudes, but among these people, only the group in France experienced an extreme spread in genes for light skin (Bazarraghaa, et al., 2020). There's evidence that the early agrarians of western and northern Europe had a particularly impoverished diet (for an excellent discussion of the nutritional, cultural, and political consequences of switching from hunter-gatherer lifestyles to an agrarian society, I highly recommend James C. Scott's *Against the Grain*), and indeed, although many of the alleles that contribute to light skin arose long ago in Africa, light skin predominated in western Europe only recently (Crawford, et al., 2017). The trait appears to have been selected for alongside lactase persistence and then spread rapidly about 4000 years ago, after agrarians had displaced or converted the original hunter-gatherers (Matthieson, et al., 2015).

I don't mean to belabor the point, but it's essential to stress in any student-oriented discussion of evolution that natural selection doesn't enrich for traits that are "better." Everything depends on a population's particular niche in an environment. Our long legs and foot shapes are great for running; they're worse than a chimpanzee's body plan for climbing trees. Lightly pigmented skin carries a very clear cost—UV penetration with its attendant folate degradation, skin cancers, and discomfort—and only carries compensatory benefit at extreme northern or southern latitudes among ancestral populations with diets low in vitamin D (Jablonski & Chaplin, 2013; Schmid & Walther, 2013). We do ourselves a disservice if we consider the selective pressures encountered by one particular group of *Homo sapiens* to be the default against which all others are measured.

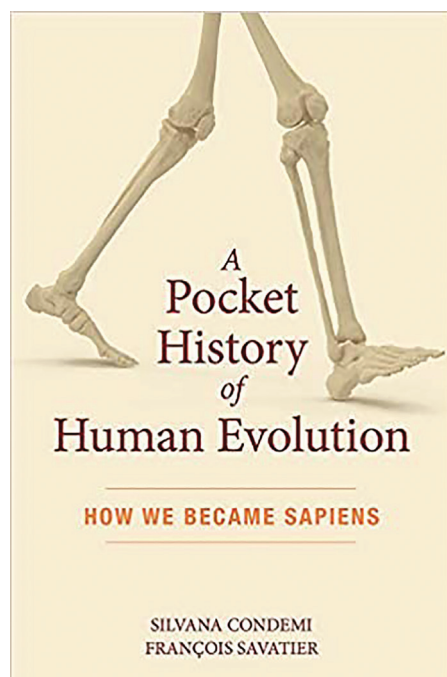
With that said, I felt like Rutherford's *A Brief History of Everyone Who Ever Lived* does a great job of unpacking these nuances. Throughout the book, Rutherford strives to correct misconceptions that a person may have picked up from the popular press. There's a definite focus on rebutting news stories from England, which might feel a bit disconnected from the experience of American audiences—I don't recall reading much about the genetic identification of Richard III or Jack the Ripper in my local newspapers—but these chapters are mostly self-contained and could potentially be skipped.

I'd be happy to recommend the book to students and lay readers alike. Rutherford provides excellent explanations of complicated techniques, including both experimental protocols and the data analysis. His discussions of human migration, family trees, and genetic diversity are scientifically rigorous and intentionally antiracist. If you're an Anglophile, listening to Rutherford's self-narrated audiobook is easily a five-frog experience.

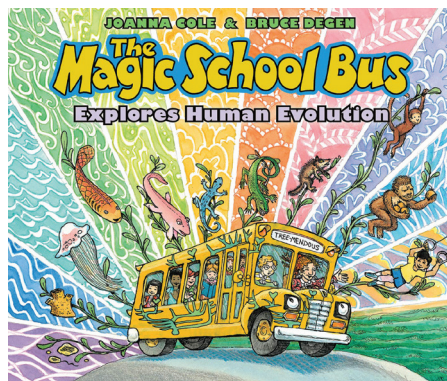
Unfortunately, I'd hesitate to recommend either Bernard Wood's *Human Evolution: A Very Short Introduction* or Condemi and Savatier's *A Pocket History of Human Evolution* to a student who expressed interest in the topic. Wood devotes so much of the brief text to arguments among recent archaeologists that there's not much space left for the evolutionary yarns that I imagine would most excite students. Readers will learn a lot about archaeological digs, but not so much about the selective pressures that made our species into who we are today.

Indeed, I can imagine that Wood's brevity could occasionally worsen evolutionary misconceptions. In a remark on Neanderthal

A Pocket History of Human Evolution: How We Became Sapiens. By Silvana Conde mi and François Savatier. 2019. The Experi ment. (ISBN 9781615196043). 160 pp.



The Magic School Bus Explores Human Evo lution. By Joanna Cole and Bruce Degen. 2021. Scholastic. (ISBN 9780590108287). 56 pp.



contributions to contemporary *Homo sapi ens* genomes (which receives fewer words than a description of anthropological course offerings at Cambridge in the 1940s!), Wood mentions that Neanderthal genes “have been linked with mood disorders.” Not only is this a reductive way to describe the interplay between genes and our local environment—like referring to the travails of a tall person squeezed into an airplane seat as a “height disorder”—but it’s a striking exaggeration of the data, which showed that, among con temporary humans with broadly European ancestry, people with slightly more Neander thal sequences in their DNA are slightly more

likely to have been diagnosed with depres sion (Simonti, et al., 2016).

By way of contrast, this is exactly the sort of overstatement that Rutherford care fully unpacks for his readers.

Conde mi and Savatier do focus on topics that I think would excite students, but they present both uncontroversial theories and highly speculative ideas (e.g., of the latter, that *Homo sapiens* displaced *Homo neanderthalis* because gender segregation in labor made our species more successful, or that contemporary Italians use their hands a lot when speak ing because Roman slaves in antiquity had been captured from many different linguistic groups) in almost identical tones. For a reader who hadn’t previously been exposed to the topic, I fear that their book would give a rather distorted impression of the field.

Given how difficult these topics are, and how nitpicky I felt while reading through this set of books, I was shocked by how much I enjoyed Cole and Degen’s *The Magic School Bus Explores Human Evolution*, which Glenn Branch reviewed in more depth in the Feb ruary 2022 issue of *The American Biology Teacher* (Glaze & Branch, 2022). Starting from the earliest cells, Cole and Degen give clear and accurate descriptions of some selec tive pressures that could cause one branch of the tree of life to lead toward us.

In a children’s book about evolution, it’s tricky to avoid teleological misconceptions—the idea that evolution is making creatures “better”—which was my only minor quibble about Jonathan Tweet’s charming picture book *Grandmother Fish*. Here, I feel like Cole and Degen do an admirable job. When discussing the split between worms and jawless fish, they write, “Millions of years went by, and life kept changing. There were still sea worms, but jaw less fish had evolved, too.” I love that the text hints at the fact that worms are still good, tre mendously successful creatures! That sort of distinction would be so easy to gloss over, yet it’s the essential point that makes Charles Darwin’s theory of evolution tick, whereas his grandfa ther Erasmus Darwin’s “everything from shells” was mere speculation.

Throughout Cole and Degen’s book, the time-traveling schoolchildren are illustrated as inhabiting whatever body morph our closest ancestors had at the time. My kids, ages five and seven, loved this! But I can imagine that some of the art could distress a younger child: the characters occasionally look like they’re being eaten by lizards. For a two-year-old, I’d probably recommend *Grandmother Fish* instead. For any school age child, though, this latest entry to *The Magic School Bus* series feels fantastic.

A Brief History of Everyone Who Ever Lived



Human Evolution: A Very Short Introduction



A Pocket History of Human Evolution



The Magic School Bus Explores Human Evolution



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