

Collecting to the Core — Evolution for Everyone

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Column Editor's Note: The "Collecting to the Core" column highlights monographic works that are essential to the academic library within a particular discipline, inspired by the *Resources for College Libraries* bibliography (online at <http://www.rclweb.net>). In each essay, subject specialists introduce and explain the classic titles and topics that continue to remain relevant to the undergraduate curriculum and library collection. Disciplinary trends may shift, but some classics never go out of style. — AD

Evolution is fascinating subject matter for specialist researchers as well as the general reader. Tracing a universe set in motion by a "big bang" 13.8 billion years ago, science scholarship has shown that evolutionary change is never-ending. We have learned that life emerged from stardust and under "just so" conditions single living cells arose. Throughout its 4.5-billion-year existence, Earth has been shaped by cataclysmic as well as infinitesimal change, and the life forms that began approximately 3.5 billion years ago have adapted to — or perished from — the many different conditions and circumstances. Recent decades have brought new discoveries from the field by paleontologists and biologists and in the laboratory by molecular biologists and geneticists. This essay discusses evolution books (largely specific to animals) aimed primarily at the general public or nonscience student. Any single one of these titles offers an accessible background to evolutionary science; as a whole, they provide a small collection of contemporary general works for anyone interested in evolution and the history of life on Earth.

Georges-Louis Leclerc, Comte de Buffon, natural historian of wide-ranging interests, conceived of the ideas of geological history and paleontology in the mid-eighteenth century, preceding those with much more familiar names in the foundation of evolutionary theory: **Charles Darwin**, **Alfred Russel Wallace**, **Jean-Baptiste Lamarck**. Additional credit belongs to **George Gaylord Simpson**, **Alfred Romer**, and **Lynn Margulis** for testing and transforming evolutionary theory into proven fact. **John Maynard Smith** deserves recognition as having written one of the twentieth century's seminal works in the field, *The Theory of Evolution*, first published by **Penguin** in 1958 with a 1993 canto edition from **Cambridge University Press** featuring a foreword by **Richard Dawkins**.¹ Whereas **Maynard Smith's** work is perhaps the most dense cited here (though quite comprehensible for the general reader), the most beautiful book in this list is easily evolutionary biologist **Douglas Palmer's** *Evolution: The*

Story of Life.² It definitely qualifies for the coffee table, as it is filled with illustrations providing wonderful tableaux of prehistoric periods derived from "100 of the finest fossil sites from around the world." Characteristic species are drawn, named, and placed in time and space, all in full color. **Palmer** includes a gazetteer of sites, an index to species, a taxonomic listing of species, and a section depicting relationships (cladistics) among animals based on fossil and biochemical similarities. By contrast, paleontologist **Michael Benton** has written *The History of Life*, which you can stick in your pocket, though it is also available online as part of **Oxford's** "Very Short Introduction Series."³ It is eminently readable, with 20 key photos, charts, and illustrations. His chapters include origins of life, sex, skeletons, and life on land. He devotes a chapter to "Forests and Flight," when plants and animals adapted to land-living, and he discusses the end-Permian mass extinction and origins of modern ecosystems and humans.

The lasting legacy of **Charles Darwin** reverberates through nearly all present-day work on evolution. Modern scientists not only build on **Darwin's** hypotheses and observations, they use his lyrical language. One of the most recent to do so is author **Carl Zimmer**, an award-winning and reliable source for eloquent popular science writing. His 2014 *The Tangled Bank: An Introduction to Evolution* is a valuable textbook whose title alludes to **Darwin's** poetic imagery, from the concluding pages of the *Origin of Species*, of an "entangled bank" teeming with interdependent life forms.⁴ **Zimmer** briefly defines evolution as "descent with modification" and sets out his agenda with the statement, "Understanding evolution is too important to be limited only to evolutionary biologists." He begins with "Walking Whales," showing that some forms of life returned to the water; additional chapters cover geology and paleontology, the biological tree of life, how change can occur, molecular evolution, adaptation, sex, origins, and macroevolution. The final three chapters deal with the evolution of humans and behavior, as well as evolutionary medicine. Each chapter has a generous bibliography pointing readers to further research and nearly every page features a color photo, illustration, chart, or graph.

If pictures appeal, certainly *Fossils: The History of Life* by **Richard Fortey**, former senior paleontologist at London's **Natural History Museum**, deserves inclusion. Now in its fourth edition, this volume illustrates

life over time with beautiful, colorful fossil photos and illustrations, and **Fortey** has won much recognition for his ability to explain science to the public.⁵ One would be completely edified and entertained by reading any of the following books by evolutionary biologist **Sean B. Carroll**: *The Making of the Fittest*, *Endless Forms Most Beautiful*, or *Remarkable Creatures*.⁶⁻⁸ His ability to communicate abstruse concepts and clearly illustrate scientific stories makes him one of the current preeminent authors writing scientific research with mass appeal. The chapters of *Fittest* begin with captivating stories from great moments of scientific history, including the first use of DNA analysis, the discoveries of the icefish and the coelacanth, and the tale of **Trofim Lysenko's** pseudoscience. In *Remarkable Creatures* **Carroll** presents a



compilation of biographies of famous naturalists and scientists who have made remarkable discoveries, often under great hardships, in natural history, fossils, or species. He features the groundbreaking work from thinkers like **Alexander von Humboldt**, **Charles Darwin**, **Alfred Russel**

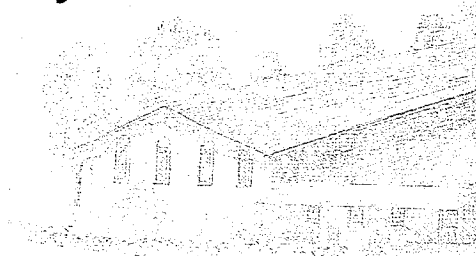
Wallace, and **Henry Walter Bates**, then moves into the modern molecular basis for evolution with stories about **Linus Pauling**, **Emile Zuckerkandl**, **Allan Wilson**, **Vincent Sarich**, **Mark Stoneking**, and **Svante Pääbo**.

Any list discussing monographs on evolution should also include work by the influential paleontologist and evolutionary biologist **Stephen Jay Gould**. Of his many works, *Wonderful Life* is included here because of its discussion of the **Burgess Shale Formation** found in the **Canadian Rockies**.⁹ These are fascinating fossils of many different soft-bodied fauna that appear to have no descendants, an example of "chance" evolution. In this book **Gould** also echoes **Darwin's** ideas regarding the testability of evolution — its unpredictability and contingent nature — by explaining theories via "embryology, biogeography, the fossil record, vestigial organs, and taxonomic relationships."¹⁰ **Andrew Knoll** (Professor of Natural History and Professor of Earth and Planetary Sciences at **Harvard University**) deserves inclusion also for his scholarly yet lucid book *Life on a Young Planet: The First Three Billion Years of Evolution on Earth*.¹¹ He writes picturesquely, even though the book does not contain many pictures or illustrations, and the epilogue is particularly eloquent. This book includes a lengthy section for further reading. Paleontologist **Neil Shubin** is Professor of Anatomy

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at the **University of Chicago** and was part of a team to discover a missing link in the evolution of creatures from sea to land, *Tiktaalik roseae*. His *Your Inner Fish: A Journey into the 3.5 Billion Year History of the Human Body* traces aspects of human development from the first vertebrates, following the phylogeny (development over generations of related species) of teleost fishes to human anatomy: arms and hands, teeth, breathing apparatus, olfaction, hearing, and vision.¹² This monograph is a best seller which has also been adapted into a PBS television series, and represents well how approachable scientific research can be for the general population.

Titles explaining evolution also often directly confront the sector of skeptics who doubt evolutionary science. Two publications released in 2009 (also the 150th anniversary of the original publication of **Darwin's** *The Origin of the Species*) attempt to cement evolution as a scientific certainty. **Richard Dawkins** is a well-known scientist (and secularist) who makes a very solid case for the "inescapable fact" of evolution in *The Greatest Show on Earth: The Evidence for Evolution*.¹³ The evidence presented is not only observational and empirical, but has been experimentally recreated in the lab as well. **Jerry Coyne**, a professor in ecology

and evolutionary biology at the **University of Chicago**, wrote *Why Evolution Is True*.¹⁴ He defines evolution and explains how we can tell the age of fossils by what is "Written in the Rocks." **Coyne** discusses embryonic development and dead ends, with chapters on sexual selection and human evolution. Throughout, the writing is clear, insightful, and well documented. *The Fact of Evolution*, by anthropologist **Cameron Smith**, plainly explains biological replication, variation, selection, speciation, and evolution.¹⁵ He recounts evidences of evolution in action with examples from insects, crustaceans, birds, fish, mammals, viruses, and other microbes. There are figures and tables, extensive notes and indexes, and a healthy bibliography and webliography.

Scientific discourse naturally contains a long history of contrasting and culturally charged viewpoints (see eighteenth-century French paleontologist **George Cuvier** and his then-radical ideas on extinction); other authors attempt to integrate the possibility that religious belief is compatible with evolutionary truth. **Nobel Prize** winner and biochemist **Christian de Duve** has written a few books that approach evolutionary science with an element of spiritual grace. *Life Evolving: Molecules, Mind, and Meaning* explores the chemical molecules that make up life, the origin of cells, multicellularity, and beyond.¹⁶ Raised Catholic, **de Duve** writes eloquently about the differences between science and

religion. His later book, *Genetics of Original Sin: The Impact of Natural Selection on the Future of Humanity*, is outstanding, but rather despairing of humanity's destructiveness.¹⁷ **Simon Conway Morris**, a paleobiologist, takes the position that evolution is more patterned and directed than random. He has written at least one monograph defending this stance, *Life's Solution: Inevitable Humans in a Lonely Universe*, as well as chapters for compilations on science and religion.¹⁸ An excellent book on evolution and the origin of life is *How Life Began: Evolution's Three Geneses*, by French marine biologist **Alexandre Meinesz** (translated by **Daniel Simberloff**).¹⁹ It concentrates on three "geneses" of life—bacteria, nucleated cells, and multicellular organisms—showcasing how evolutionary events like natural selection, recombination, mutation, and geologic cataclysm create biodiversity and a "grandeur of life."

In a topic as historic, wondrous, universal, and ever-changing as evolution, it can be challenging to limit titles to a brief bibliography such as this. Many of the selections herein exist at a fine intersection to be profitably, and enjoyably, read by both the amateur and professional. These monographs not only complement the undergraduate library collection in the sciences; they offer entry for everyone into the never-ending story of evolutionary life on Earth. 🌱

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Media-Centered — More Docs to Watch

Endnotes

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Editor's note: An asterisk () denotes a title selected for *Resources for College Libraries*.

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Column Editor's Note: *The use of media in the classroom is ubiquitous, especially with the ready availability of streaming online. Visual theses are on the rise. Academic interest in and classroom use of film and global cinema continues to grow at an exponential rate. Resultantly, the importance of a rich and varied media resources collection is essential to academic institutions, public libraries, and K-12 media centers. It takes a lot of work, development, and research to maintain and grow a collection like this. Resources that aid in this process are invaluable... — WM*

Now several editions in to this column, I have touched on many elements of collection development and acquisitions for Media ranging from pedagogy to copyright as well as offering nuts and bolts information on streaming media, distribution and professional development organizations. Last time, I offered the first of a multi-edition article outlining short lists of documentaries to watch. All of them have sparked considerable conversations at screenings and festivals I have attended and many of them will find resonance in our collection at UNC. Loathe to assign a hierarchy to films that all offer something unique, important or memorable — here in no particular order are more docs to watch.

La Maison De La Radio

Renowned French director **Nicolas Philibert** (Être et avoir) delivers a quirky and thoroughly enjoyable documentary of a behind-the-airwaves look at Radio France. Evoking his trademark cinematic style, inquisitive lens, and thoughtful (albeit at a considerably amped up speed) pacing, **Philibert** deliberately sets out to present a "day-in-the-life-of" Radio France. And he does just that; in a fluid whirlwind hour and a half we see a richly composed approximation of a day (and night) at the station.

One by one, we're introduced (without caption) to the key players, producers, writers, guests and crew that create the shows and broadcasts for Radio France. What makes this film so engrossing is that we're not left to suffer a stream of talking heads discussing what they do for Radio France, we see them in action: in their sound booths, at the drafting table, in planning sessions, speaking with their sources, editing their segments, getting feedback from their producers, singing, taping, and interviewing guests.

One of the underlying strengths of **Philibert's** work here is that he balances action with moments of silence — for example, the dead air at the producer's table when some-

one suggests they interview **Justin Beiber**, speaks volumes... Other scenes rely entirely on visuals and conversations in concert and sometimes to comedic effect as with **Frédéric Lodéon**, the fellow who runs a classical music show and is shown buried amongst stacks and stacks of CDs with just his head peaking out for the interview.

Ultimately, **Philibert** has expertly stitched together many hours of close observation of the intensely busy, productive world that is Radio France, providing an often interior and reflective piece albeit one with moments of frenetic effervescence.

La Maison de la Radio Director: **Nicolas Philibert** 2013 Country: France. Available on DVD or streaming through Kino Lorber edu: <http://bit.ly/lpi3AAG>.

Evolution of a Criminal

Filmmaker **Darius Monroe** has an extremely important first-hand story to tell about the far-reaching effects of poverty on American youth. In this compelling personal narrative, **Monroe** charts the unlikely path and resulting consequences of one very ill-conceived decision of his youth. How does a well-liked 16-year-old go from honor student to convicted felon overnight? Overwhelmed by his family's mounting financial problems, **Darius** and two of his friends planned a robbery. Leaving school midday, they drove to the suburbs of Houston and held-up a neighborhood bank. **Monroe** and his friends were caught, he was tried as an adult, and he ended up serving three years of a five-year sentence in prison.

Many years later, after earning a masters degree from NYU's Graduate Film program, **Monroe** experienced a panic attack in line at a bank and realized he needed to go back to Houston and apologize. Not quite sure how to get started, he decided to turn the camera on himself on his return to Houston, yielding this unflinching, and intimate documentary. What we see, is a dramatic reenactment of the events leading up to the robbery and **Monroe's** incarceration — quite effectively interspersed with archival footage and illuminating interviews with members of his family, old friends, witnesses from the bank and the case prosecutor.

Evolution of a Criminal Director: **Darius Clark Monroe** 2014 Country: USA. For more info, visit: <https://www.facebook.com/evolutionofacriminal>.

Rich Hill

Filmmaker **Tracy Doz Tragos** grew up visiting her grandparents in Rich Hill as a child. Years later, she returns with her cousin **Andrew Droz Palermo** and a camera to capture —

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