

## FIREFLIES

***Silent Sparks: The Wondrous World of Fireflies.*** By Sara Lewis. 2016. Princeton University Press (ISBN 978-0-691-16268-3) 223 pp. Hardcover. \$29.95

Fireflies are accessible biological magic: jewels of light glinting in summer evenings throughout the world. *Silent Sparks* is a treasure trove of information that will leave the reader even more astounded by these wondrous insects. Gracefully presented by Sara Lewis, who has studied fireflies for over 30 years as a professor in the Department of Biology at Tufts University, *Silent Sparks* is well worth reading from cover to cover. Topics include the life stages of the firefly life cycle, firefly courtship (including “translation” of their visual love messages), the evolutionary value of nuptial gifts, glowworms, the anatomy and biochemistry of firefly light, the marvel of synchronous flashing, eating fireflies (in a word: don’t, unless you are a very specific predator), mimicry, ecology, and the relationship between humans and fireflies. Lewis’ appendices include a field guide to common

fireflies and guidelines for “Further Firefly Adventures,” including “Talking to Fireflies,” ways to explore firefly pheromones, and a gear list for conducting your own firefly expeditions.

Lewis prefaces the book with “Confessions of a Scientist Enraptured”—and her love for her research subject is evident throughout. Her enthusiasm is infectious—how could any biologist resist: “Their spectacular sex lives is what first got me hooked on fireflies. Lately . . . I’ve been fascinated by these stories of chemical defense—such a thrilling mix of poison, treachery, and thieves!” Lewis is not the only researcher to fall under fireflies’ spell, and she chronicles the work—and feuds!—of researchers. (Who knew that firefly research could lead to career-destroying factionalism?) The works of many biologists are presented with clear, detailed, and fascinating descriptions, allowing the reader to see the scientific mind at work, discovering the connections between intricacies of reproductive systems and the “economic transaction” of nuptial gifts; anatomy, chemistry, and physiology of the firefly’s flash; the role of Eisner’s pet thrush in triggering investigation into firefly poisons; and much more. Sadly, *Silent Sparks* also chronicles the decline in these marvelous creatures as human activities decrease firefly habitat worldwide, from the golf courses and housing developments of the United States to the shores of Malaysia’s Selangor River, famed for display trees of synchronously flashing fireflies. Lewis has hope, though, in the nature societies and individuals beginning to take stewardship for firefly survival.

*Silent Sparks* is rich in interdisciplinary exploration—you would be hard put to find a chapter in a standard biology textbook that is not presented in the light (no pun intended) of firefly biology and research. Examples abound of biological concepts in process, and biologists in action. As such, *Silent Sparks* could provide examples and supplemental readings to biology students; it also would be a great candidate for extended text reading for classroom book reviews.

The only fault in this handsome volume is that there could be more illustrations—there are several instances in which an illustration would greatly enhance verbal descriptions—however, this is a minor issue. Anyone interested in fireflies, biology, biologists, science, and curiosity will find *Silent Sparks* a reading treasure.



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## SEVEN SKELETONS

Fig 01 THE OLD MAN	Fig 06 PEKING MAN
Fig 02 FETTERDOWN	Fig 07 LUCY
Fig 03 TAUNG-CHIEF	Fig 08 FLO
	Fig 09 SÉDRA



THE EVOLUTION OF THE  
WORLD'S MOST FAMOUS HUMAN FOSSILS

## LYDIA PYNE

## HUMAN EVOLUTION AND CELEBRITY FOSSILS

***Seven Skeletons.*** By Lydia Pyne. 2016. Viking, An imprint of Penguin Random House. (ISBN: 978-0-525-42985-2). 283pp. Hardcover \$28.00.

What is it about some fossils that enable them to take on a life beyond the bones? Why is it that some not only withstand scientific scrutiny but become a part of us on a level that transcends their value as scientific artifacts of our human heritage? Lydia Pyne explains this phenomenon of fossil celebrity in *Seven Skeletons*, examining the story of human evolution through fossils that have established a solid hold on our hearts and minds as well as human history. From page one, Pyne provides a lens that explores the historical beginnings of the modern human evolution narrative while also capturing the birth of the field of paleoanthropology—both of which have grown in scope and complexity over the last century.

Pyne illustrates through the complex history of each discovery that “bones are mute,” therefore we construct the knowledge that surrounds them, and they become situated in our cultural history (p. 4). It is our need to construct explanations that make cultural sense to us that drives us to seek these connections to humanity’s past. Celebrity, whether in life or, in this case, fossils, is shaped by the audience, as well as the story and tradition that surrounds them, which combine to become a part of our own identity as human beings. In fact, it is not the bones themselves but the questions that they evoke that bring them to the forefront of our understanding and interest. These stories are what set the precedent for framing science as part of a larger social narrative, and in this book the narrative is compelling and powerful.

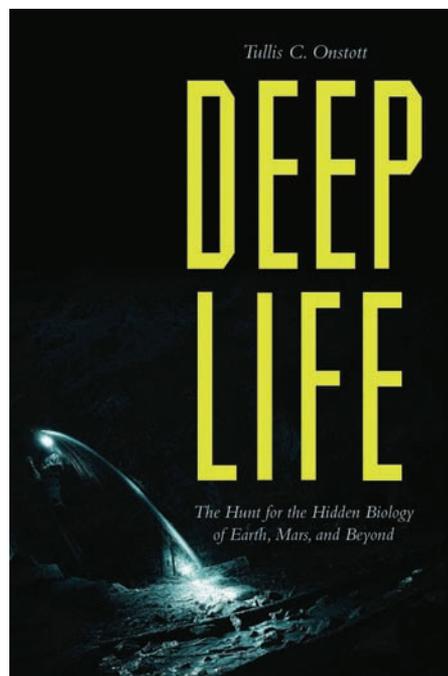
Each chapter is a step back in time—some recent, some distant—to look at the lives and circumstances interlocked with the fossils they found. Each chapter of this book examines a different celebrity fossil or collection: *Neanderthal*, *Pittdown*, *Taung Child*, *Peking Man*, *Lucy*, *Flo*, and *Sediba*. They represent archetype, original, controversy, and even fraud. Framed in the context of their discovery, they connect with popular culture—Lucy in the sky with diamonds and “The Precious” that is Flo; from the film noir-esque intrigue surrounding the collection that would be known as Peking Man, to the story of a boy and his dog whose wandering discovery rearranged our thinking about the human story in Africa. These stories give a uniquely personal voice to human evolution, one often missing from classrooms and public conversations alike. In fact, it is impossible to read *Seven Skeletons* without coming away with a greater sense of connection to the scientists, the fossils, and their relevance to our story as human beings.

This book has value in a wide range of contexts. The stories are robust and scientifically sound, making each chapter an interesting study in human evolution. At the same time, Pyne

narrates an accurate but engaging history of the practice of science and the characters involved, for better or worse in some cases, that engages the reader in a way most often reserved for fiction novels. I can see these chapters being used from secondary to post-secondary to engage students and teachers on a deeper level in scientific discovery as well as the nature and process of science. *Seven Skeletons* is written to interest a wide range of readers, from those with casual interest to those who are immersed within evolutionary studies, because it draws the reader into the greater story about the human element—in science, in culture, and in evolution.



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#### MICROBIOLOGY

*Deep Life: The Hunt for the Hidden Biology of Earth, Mars, and Beyond.* By Tullis Onstott. 2016. Princeton University Press. (ISBN 9780691096445). 512 pp. Cloth. \$35.00.

As I read this book about finding life in unexpected places, I was reminded of a *Star Trek* episode, “The Devil in the Dark.” Kirk, Spock, and crew encounter a silicon-based life form living deep in the rock of an alien planet—totally

unexpected and totally foreign. Yet, by the end of the program, the *Star Trek* crew come to understand the Horta, as the life form is called, and they even collaborate with it to find valuable mineral reserves buried deep in the rock of the planet. *Deep Life* concerns the search for life in a place where no one would expect to find life: in the subsurface rock of Earth. Author Tullis Onstott, a geomicrobiologist, writes:

We do not normally think of rock as harboring life. We quarry granite for building stone, volcanic rock for road gravel, and marble for table tops and great works of art. I would wager that the last thought on your mind as you gaze upon Michelangelo’s *David* towering above you in the Academia Gallery in Florence is the fact that within microscopic pores buried inches beneath the smooth surface of Carrara marble are living bacteria.

The author introduces the scope of the book by posing questions related to the extent of subsurface life, the depth to which this life can be found, the lifespan of subsurface life, the possibilities for subsurface life on other planets, especially Mars, and finally the possible origins of subsurface life—where did this life come from, and how did it get there? The book begins with the discovery of subsurface life and techniques for demonstrating that subsurface organisms are not contaminants. Subsequent chapters explore some of the locales where the author journeyed to find evidence for subsurface life, such as the gold mines of South Africa. Finally, the author introduces us to some of the organisms living at great depths, such as a novel, new bacterium that lives off of radioactive decay and “the worm from Hell,” a hermaphroditic worm living one mile beneath the surface. Appendices at the end of the book provide the reader with a chronology of subsurface life investigations, summaries of U.S. DOE meetings, and a glossary of terms.

As an instructor of microbiology, I found the book to be a fascinating read. My undergraduate students would enjoy the stories of discovery and the descriptions of unusual life forms. My only reservation is that the writing is rather detailed and presumes some knowledge of biology and geology.



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