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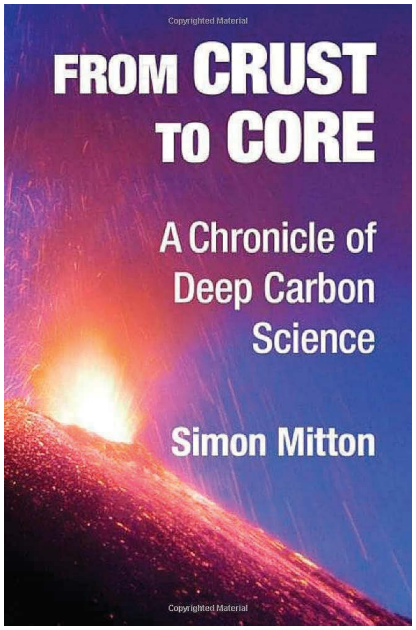
Book Review

Book Review: From Crust to Core: A Chronicle of Deep Carbon Science. (2021) By Simon Mitton. Cambridge. ISBN 9781108426695, 382 pages. $47.99.

The book titled *Crust to Core: A Chronicle of Deep Carbon Science* by Simon Mitton is an eloquently written narrative of the history of geological sciences. Spanning the delivery of cosmic carbon to carbon in the Earth's interior and in living organisms, the author does a wonderful job of storytelling how key concepts on the formation and evolution of Earth were developed. Across its fifteen chapters, the book recollects history not only of natural science and of its development through time, but it also brings out the prominent players, even some lesser-known names, and their personalities through anecdotes. A unique aspect of the book, of course, is the fact that it not only recounts the history of geology from Earth's surface observables but also from the standpoint of its inner workings and structure and how we came to learn about them. It talks about breakthroughs in collaborative science after World War II, with theory, new technologies, and observations coming together to change the paradigm of how we understand the Earth today. The book recounts the developmental history of the fundamental concepts of continental drift, seafloor spreading, and magnetic reversals. The book also covers how scientists gradually came to understand fossil records and stratigraphy to reconstruct Earth history and how the studies of coal petrogenesis led to the understanding of carbon drawdown from the atmosphere. The historical account of the emergence of various concepts was a great reminder of how science progresses through time, mostly following a stick-slip behavior—lack or apparent lack of any breakthroughs for decades punctuated by major conceptual progress, often aided by new technologies. Yet, the book reminds us how scientific observations made during those periods of quiescence often proved pivotal in later discoveries.

With the preparation of such a broad canvas of the chronological development of geology and appreciation of whole Earth system science, Dr. Mitton discusses how and why deep carbon science had to be appreciated and developed. I found this sequential progression to be very logical as what we understand about the deep carbon cycle today is definitely utilizing the framework of star and planet formation and subsequent planetary evolution, including the rock cycle. To this end, the book presents some of the key discoveries of deep carbon mineralogy, diamonds, reservoirs and fluxes involving deep Earth and deep-time carbon, as well as discoveries related to life's origin and existence deep underground. It is important to remind ourselves that the author was invited to write the book as part of the educational legacy of the Deep Carbon Observatory (DCO), a Sloan Foundation sponsored, decade-long initiative that was led by the scientists at the Carnegie Institution of Washington. Although deep carbon research was definitely ongoing in various parts of the world from the 1970s to the early 2000s, DCO definitely brought more concerted attention to the topic. Mitton's book focuses on the most recent history on the deep carbon science, outlining some of the key scientific findings and activities that took place as part of the various DCO initiatives and led by some of the DCO scientists.



The book also has necessary illustrations—cartoon sketches, field photos, and portraits of key scientific figures.

In summary, Mitton's book *From Crust to Core* should be a great read for anyone from science and natural history enthusiasts to students or researchers of Earth and planetary sciences. The chronicle on deep carbon science is not necessarily exhaustive, however. The appeal of the book is in its accounts of the history of geology, the many geologists that shaped the discipline over the last centuries, and in taking the reader though a journey that describes how Earth science as a discipline matured through time to a system-level science.

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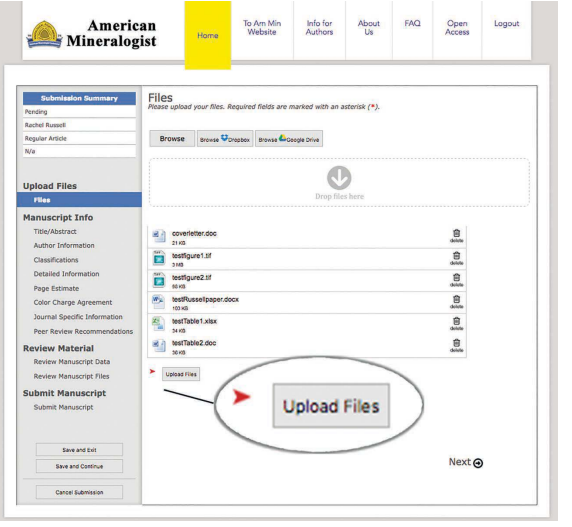

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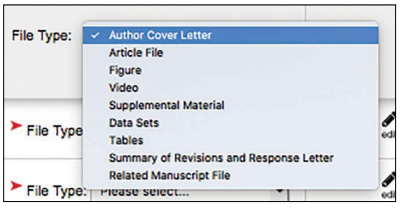

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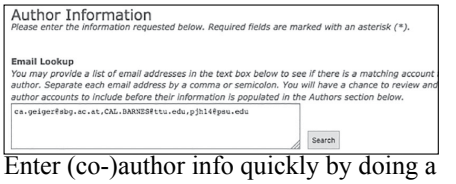

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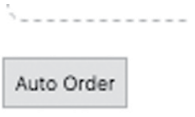

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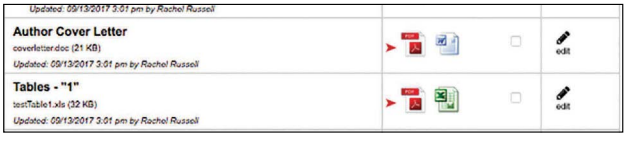

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