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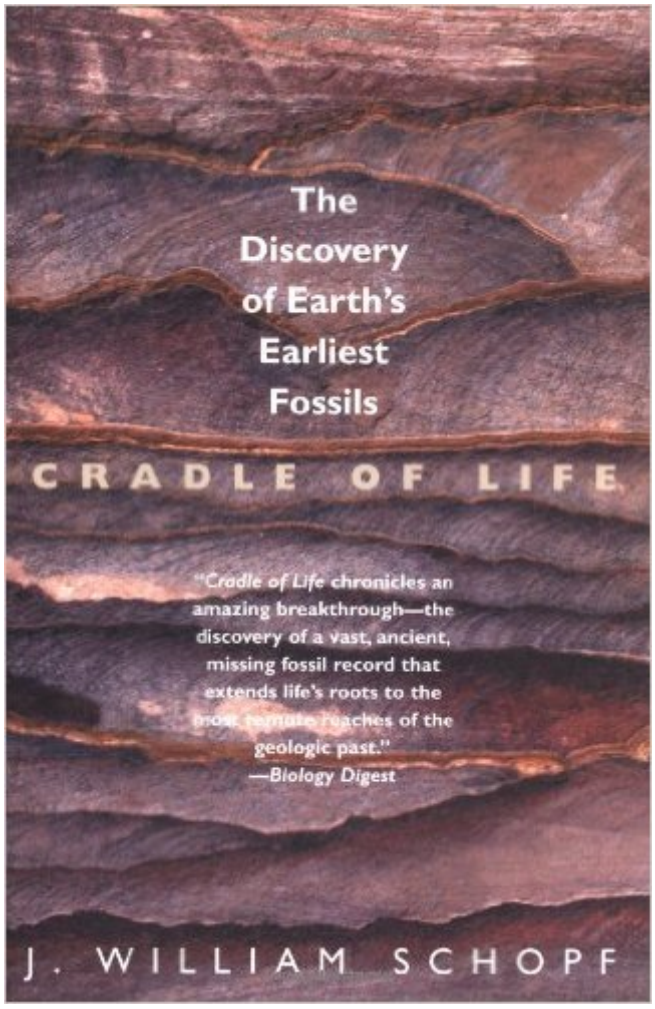
Cradle Of Life: The Discovery Of Earth's Earliest Fossils



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Synopsis

One of the greatest mysteries in reconstructing the history of life on Earth has been the apparent absence of fossils dating back more than 550 million years. We have long known that fossils of sophisticated marine life-forms existed at the dawn of the Cambrian Period, but until recently scientists had found no traces of Precambrian fossils. The quest to find such traces began in earnest in the mid-1960s and culminated in one dramatic moment in 1993 when William Schopf identified fossilized microorganisms three and a half billion years old. This startling find opened up a vast period of time--some eighty-five percent of Earth's history--to new research and new ideas about life's beginnings. In this book, William Schopf, a pioneer of modern paleobiology, tells for the first time the exciting and fascinating story of the origins and earliest evolution of life and how that story has been unearthed.Gracefully blending his personal story of discovery with the basics needed to understand the astonishing science he describes, Schopf has produced an introduction to paleobiology for the interested reader as well as a primer for beginning students in the field. He considers such questions as how did primitive bacteria, pond scum, evolve into the complex life-forms found at the beginning of the Cambrian Period? How do scientists identify ancient microbes and what do these tiny creatures tell us about the environment of the early Earth? (And, in a related chapter, Schopf discusses his role in the controversy that swirls around recent claims of fossils in the famed meteorite from Mars.) Like all great teachers, Schopf teaches the non-specialist enough about his subject along the way that we can easily follow his descriptions of the geology, biology, and chemistry behind these discoveries. Anyone interested in the intriguing questions of the origins of life on Earth and how those origins have been discovered will find this story the best place to start.

Book Information

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Customer Reviews

Wow. I am surprised at how much has been learned about the early phases of life’s development since I last formally studied paleontology. One of my favorite areas of study was invertebrate and early life forms. At the time only a modest amount was known about stromatalites and cyanobacteria. The trace fossils of the soft bodied, multicellular, Ediacaran fauna were known but were considered "late" in geologic and biologic terms. The Burgess Shale community, made famous by Gould’s "Wonderful Life" in the late ’80s, was known, but the organisms were confusing and many have since been restudied and reclassified. Having been a leading actor in the field of microfossils and early bacterial life forms, Schopf puts everything into perspective in his book, making it virtually a history of research into the topic of life’s beginnings.Cradle of Life begins, as such books so often do, with a brief synopsis of Darwin and his theory of evolution, including most critically, its early problems. Thereafter Schopf begins a veritable "who’s who" of early paleontology, giving short professional biographies of those who worked in the field as early as the 19th century. He points out where promising leads were suppressed by virtue of the lesser standing of the individual proposing them, and misleading theories given credence because they were proposed by someone of powerful academic credentials. Some of the tales are impressive object lessons in how things can go wrong for human reasons and why science ultimately "gets it right in the end."One of the more interesting topics the author confronts is how our recent advances in the field of paleontology might help determine whether life exists or has ever existed elsewhere.

Schopf escorts us into the realm of deep time, introducing us to our earliest microbe ancestors found locked away in ancient rocks. The path is often vague and indistinct, but Schopf is a sure and eloquent guide. Not only has he traversed the route before, but he’s helped select and clear the track. This fine book reflects Schop’s lighthearted "trailside" manner. He fully enjoys scrutinising the rocks for early lifeforms, and the enjoyment is infectious. It’s a pleasure to accompany him on this journey.Of all the ideas of the origins of life, none proved more exciting than the experiments of Harold Urey and Stanley Miller. Their zapping of elemental chemicals to produce amino acids seemed the final answer to how it all began. Years of criticism of their work and assumptions led to the acclaim fading, but Schopf here attempts to resurrect its primacy. His argument relies on his findings of evidence of wide-ranging shallow seas - Darwin’s famous "warm, shallow pond" as the

place of life's origins. Schopf argues these seas were present at the same time simple life-forms emerged. In Darwin's time, the techniques for analysing the early rocks were limited. Today, as Schopf demonstrates, looking in the right place with the proper tools brings rich paleontological rewards.After tracing the histories of several researchers in Pre-Cambrian fossils, Schopf goes on to illustrate the most recent finds and their significance. Some of the finds are beyond the realm of the rocks alone. His description of the process of polymer formation illustrates the beginning of complex chemistry leading from non-life to life. The distinction, as he notes, has become vague as research from many disciplines has been applied to evolutionary studies.

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