Symbiotic Planet: A New Look At Evolution

Lynn Margulis
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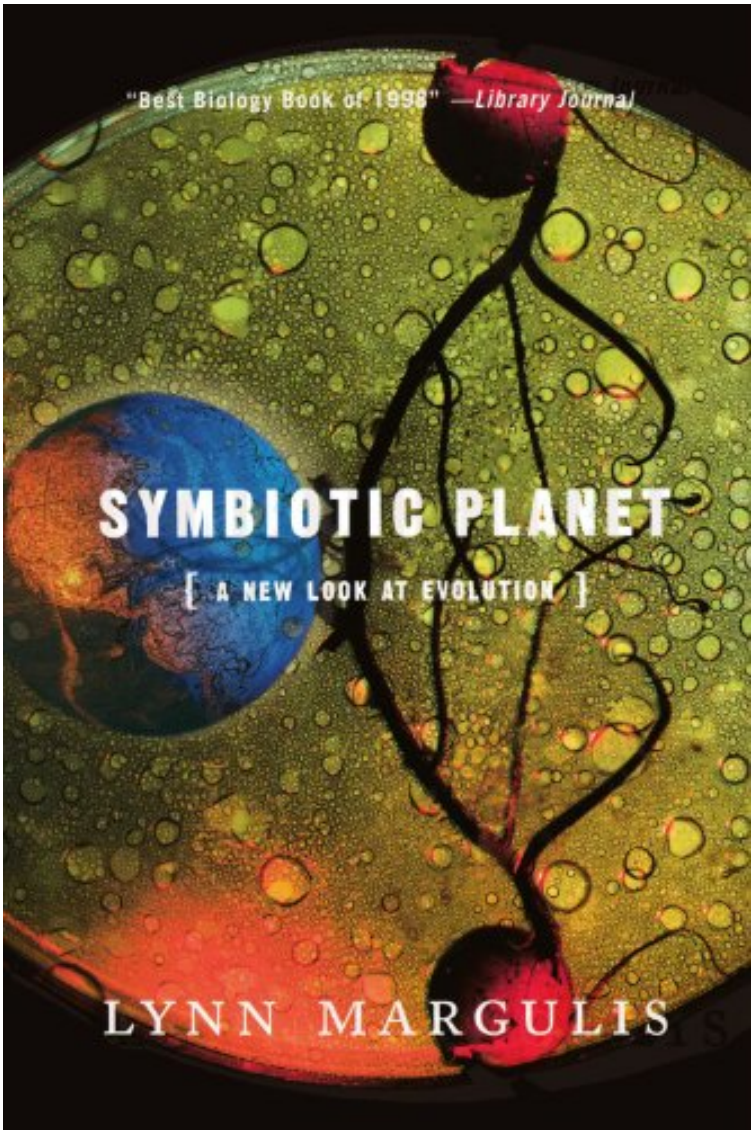

#196592 in Books Lynn Margulis 1999-10-08Original language:EnglishPDF # 1 8.00 x .38 x 5.13l, .36 #File Name: 0465072720176 pagesSymbiotic Planet A New Look at Evolution | File size: 50.Mb

Lynn Margulis : Symbiotic Planet: A New Look At Evolution before purchasing it in order to gage whether or not it would be worth my time, and all praised Symbiotic Planet: A New Look At Evolution:

5 of 5 people found the following review helpful. A New and Exciting Look at the Evolutionary ProcessBy Randolph EckI became interesting in this book because of Lynn Margulis's theory called symbiogenesis. This evolutionary term refers the origin of tissues, organisms and even species through a long-term form of symbiosis. After describing her early start in the subject matter, she notes that she has always felt that genetics was the key to evolutionary history. She observed that three classes of organelles located outside of the nucleus of a cell (plastids, mitochondria, cilia)

"resembled bacteria in their behavior and metabolism."In the chapter on Individuality by Incorporation, she tries to make the case for the symbiotic process. For example, an archaebacterium merges with a swimming bacterium, which subsequently merges with an oxygen-breathing bacterium, which subsequently engulfs, but fails to digest, a photosynthetic bacterium ultimately evolving into a swimming green algae. It is believed that our mitochondria in our cells and the chloroplasts in plant cells are of bacteriological origin. These processes are part of the theory called Serial Endosymbiosis Theory or SET. Margulis next delves into the problems with taxonomy or the classification of life. She discusses Robert Whittaker's (1924-1980) five-kingdom classification, but then goes on to develop a modified version that she feels more accurately "reflects the evolution of protoctists from symbiotic bacteria, and of animals, plants and fungi from protoctists."In discussing evolution, the author notes that the bacterial cell is the minimal unit of life, and this is where one must begin. These organisms are like more advanced life; they use energy to take up food, have DNA and RNA and proteins, and use chemical reactions to keep themselves going. It is interesting to note that "no life-form exists outside a self-maintaining, self-reproducing cell." She spends a chapter discussing the possible origins of sex which I found interesting. Moving on to the evolving of life on land, Margulis feels strongly that symbiogenesis is what made habitation on land possible. She concludes the book with a chapter on Gaia, which she defines as the physiologically regulated Earth, or the "system that emerges from ten million or more connected living species that form its incessantly active body."I found the book fairly readable for the layperson; however, you may have to research some terminology. In one chapter, for example, I came across a few undefined words or expressions, such as photosynthate food, fungal hyphal networks, and chitinase enzymes to name a few. The concept of SET is very interesting, and it appears to be another facet in our quest to understand the process of evolution.1 of 1 people found the following review helpful. "Come together, right now . . ." (The Beatles)By A. SimonThis thin book is an eyeopener for anyone not acquainted with the concept of symbiogenesis, the idea that new species occur through symbiosis. Although her work is with protists, symbiosis is found in multicellular organisms such as trees, cows, termites, etc. One protozoa is even made up of five organisms.Her theory met with considerable opposition, and Margulis points to her predecessors, both Americans and Russians for similar work, as well as her contemporaries. We also get a snippet about her life and how a series of events led her to her present scientific and personal position. An extension of her theory to a planetary basis is Lovelock's Gaia theory which, in turn, has received considerable opposition and scorn. That, too, was preceded by a Russian scientist named Vernadsky.3 of 3 people found the following review helpful. Bacteria are the Heroes of EvolutionBy M. ZavalaEating and reproducing among even the tiniest life forms is made into an incredibly fascinating journey by Lynn Margulis in this skinny publication. I found myself cheering for her explanatory theories of evolution all the way. There is something very compelling about including bacteria in the grand narrative about evolution not just in the case of humans, but in general, after all it was tiny bacteria and simple cell organisms that turned this planet into the blue gem it is today. The details of her theories are a little more involved and therefore more complicated to explain here. It is a worthwhile read even for readers who doubt their backgrounds in biology as she makes everything as clear as possible for lay readers.

Although Charles Darwin's theory of evolution laid the foundations of modern biology, it did not tell the whole story. Most remarkably, The Origin of Species said very little about, of all things, the origins of species. Darwin and his modern successors have shown very convincingly how inherited variations are naturally selected, but they leave unanswered how variant organisms come to be in the first place.In Symbiotic Planet, renowned scientist Lynn Margulis shows that symbiosis, which simply means members of different species living in physical contact with each other, is crucial to the origins of evolutionary novelty. Ranging from bacteria, the smallest kinds of life, to the largestthe living Earth itselfMargulis explains the symbiotic origins of many of evolution's most important innovations. The very cells we're made of started as symbiotic unions of different kinds of bacteria. Sexand its inevitable corollary, deatharose when failed attempts at cannibalism resulted in seasonally repeated mergers of some of our tiniest ancestors. Dry land became forested only after symbioses of algae and fungi evolved into plants. Since all living things are bathed by the same waters and atmosphere, all the inhabitants of Earth belong to a symbiotic union. Gaia, the finely tuned largest ecosystem of the Earth's surface, is just symbiosis as seen from space. Along the way, Margulis describes her initiation into the world of science and the early steps in the present revolution in evolutionary biology; the importance of species classification for how we think about the living world; and the way academic apartheid can block scientific advancement. Written with enthusiasm and authority, this is a book that could change the way you view our living Earth.

From Publishers WeeklyFrom the origin of life to the classification and phylogeny of living organisms, from a discussion of GaiaAthe belief that Earth operates like a living beingAto a discussion of the underlying reasons for sex, iconoclastic biologist Margulis (coauthor, What Is Sex?, etc.) takes on many of the big questions in biology in this small, rambling and informal tract. In a book that is part autobiography and part biological primer, MargulisAthe scientist most responsible for the theory that animal and plant cells originally arose by combining with simple bacteriaAadvances the idea that a large part of organic evolution can be explained by symbiosis, "the living together in

physical contact of organisms of different species." Rather than convincing readers of this theory, however, she seems content to lavish most of her attention on basic biological concepts. While Margulis conveys a sense of the wondrous and intricate origins of life, many of the issues she touches upon here are more clearly and comprehensively dealt with in her other works. 11 bw illustrations. Copyright 1998 Reed Business Information, Inc.From Library JournalFor 30 years, the Gaia theory of life on Earth has remained vital, dynamic, and controversial. One of its leading advocates provides a synthesis and overview of the current status of the theory, plus a few important new ideas of her own. Copyright 1999 Reed Business Information, Inc.From Scientific AmericanGracing her tale with personal touches and with lines from the poems of Emily Dickinson as chapter headings, Margulis describes the development of her theory of symbiosis and ponders how it relates to the Gaia concept of a living Earth. "No species existed before bacteria merged to form larger cells including ancestors to both plants and animals," she writes. "The permanent incorporation of bacteria inside plant and animal cells as plastids and mitochondria is the part of my serial endosymbiosis theory that now appears even in high school textbooks. But the full impact of the symbiotic view of evolution has yet to be felt. And the idea that new species arise from symbiotic mergers among members of old ones is still not even discussed in polite scientific society." The Gaia concept is that aspects of Earth's atmospheric gases and surface rocks and water are regulated by the growth, death, integration and other activities of living organisms. Gaia, Margulis says, "is a convenient name for an Earthwide phenomenon: temperature, acidity/alkalinity, and gas composition regulation"through the series of interacting ecosystems that compose a single huge ecosystem at Earth's surface. How do symbiosis and the Gaia concept relate to each other? Greg Hinkle, once Margulis's student and now a professor at the University of Massachusetts, provides an answer that Margulis likes: "Gaia is just symbiosis as seen from space."