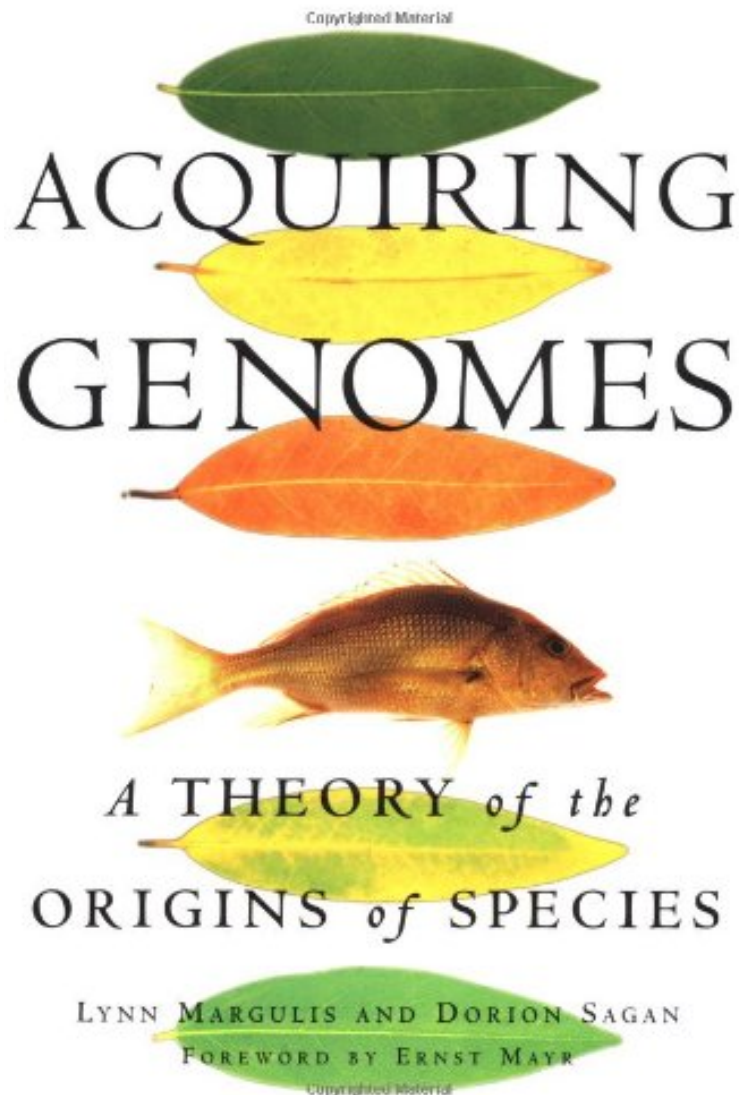


(Free) Acquiring Genomes: A Theory Of The Origins Of Species

Acquiring Genomes: A Theory Of The Origins Of Species

Lynn Margulis, Dorion Sagan
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Lynn Margulis, Dorion Sagan : Acquiring Genomes: A Theory Of The Origins Of Species before purchasing it in order to gage whether or not it would be worth my time, and all praised Acquiring Genomes: A Theory Of The Origins Of Species:

1 of 1 people found the following review helpful. Well worth reading.By R. ZubrinGreat book. Lots of profound ideas. Really goes far in overthrowing the "fundamental dogma" maintained by Dawkins and others. Acquired traits can be inherited, and transmitted! That means they in a fundamental sense, all life benefits all other life, since useful traits

evolved anywhere can ultimately potentially benefit any other species. 31 of 32 people found the following review helpful. Evolutionary science needs more free thinkers. Acquiring Genomes will not appeal to all readers. First of all, the authors clearly have little use for current dogma, that is: local mutations in chromosomes fuel evolution and, particularly, speciation. I received my degree in Zoology back in a time when paleontologists called them like they saw them, and lock-step conformity was a sign of a weak mind. I learned, in 1975, that there is precious little in the fossil record to support the concept of gradual evolution. Apparently, that has not changed. Prof. Margulis' book also assumes a reader with a broad scientific background, largely in areas considered "old fashioned" in the 21st century. She demands an upper college level familiarity with invertebrate biology, physiology, microbiology, ultrastructure, biophysical chemistry, metabolic pathways and *GASP* thermodynamics. Then she integrates molecular biology and genomics, as needed, into the picture, to make a very convincing case for symbiogenesis. She also evokes wrath for bringing up the name of Jean Baptiste Lamarck, which is sure to raise a red flag in neodarwinist circles. Last, she does not refute the contribution of neodarwinists, she simply tries to put them in perspective. The founding premise is that mutations constantly occur during the natural history of a species. Many experiments suggest 99% of these mutations are either silent or deleterious. Therefore, they probably cannot be counted on to drive evolution to improve on a species, let alone create new ones. Instead, a more likely pathway is for two species, with one bacterial, one eucaryotic, to coexist if it causes them to have a survival advantage when they do so. If it is in both organisms' best interest, this coexistence becomes more intimate, and can lead to the eucaryotic organism taking the smaller genome into its chromosome and making one very new and improved species. This, and many intermediate stages, are seen among invertebrates, such as *Geosiphon pyriforme*, a hybrid organism with a fungal (*Endogone*) and a cyanobacter (*Nostoc*) ancestor. The *Geosiphon* has retained the ability to fix carbon dioxide and nitrogen, receiving one multigene trait from one ancestor and the other from the partner species. Examples like this are why a reader needs a strong invertebrate biology background in order to appreciate these chimera. She ends the discussion with another tantalizing mechanism, called the kinetichore reproduction theory. In this process, environmental stress can lead to an additional round of kinetichore - centromere reproduction in an organism's chromosomes which leads to twice as many half-sized acrocentric chromosomes. Fertilization where one donor has undergone this alteration still leads to diploid progeny, but the diversity generated is the engine for adaptive radiation of species. Obviously, I am not ashamed to say I have bought into her arguments. If I were an academic scientist, I could have a field day testing some of her hypotheses. Instead, I am an industrial biochemist without the necessary time or manpower. That is the power of this book, however. It moves the receptive reader to want to take the bull by the horns and challenge or expand Margulis' hypotheses. She even suggests research strategies for potentially fruitful lines of inquiry. Drs Margulis and Sagan have written a lightning-rod kind of book that will attract wrath from some, and heartfelt praise from others. If you feel indifferent toward this book, I suggest you reread it with a copy of an invertebrate biology reference book at your side. 2 of 2 people found the following review helpful. An interesting theory, but not well explained for the broad range of life. By Jim Winner I've loved Dr. Margulis' work since college, 30 years ago. In this book, the authors' arguments that speciation occurs through organisms acquiring genes from other organisms is well presented and well founded. The present a compelling argument that this is a significant mechanism for creating the genetic differences necessary to create new species. However, the argument against Neodarwinism's view of natural selection based on basic gene mutation ever being sufficient to create new species is not as well presented. Nor do they present sufficient examples of or explanations how this process works in higher order taxa, such as reptiles, birds, and mammals. I think overall, the argument present falls prey to the problem of looking for a single answer to a complex history. I think there is little doubt that there has probably been a significant amount of speciation that has occurred through the blending of genomes; but I think it unlikely that it has been the only mechanism of speciation.

In this groundbreaking book, Lynn Margulis and Dorion Sagan present an answer to one of the enduring mysteries of evolution--the source of inherited variation that gives rise to new species. Random genetic mutation, long believed to be the main source of variation, is only a marginal factor. As the authors demonstrate in this book, the more important source of speciation, by far, is the acquisition of new genomes by symbiotic merger. The result of thirty years of delving into a vast, mostly arcane literature, this is the first book to go beyond--and reveal the severe limitations of--the "Modern Synthesis" that has dominated evolutionary biology for almost three generations. Lynn Margulis, whom E. O. Wilson called "one of the most successful synthetic thinkers in modern biology," and her co-author Dorion Sagan have written a comprehensive and scientifically supported presentation of a theory that directly challenges the assumptions we hold about the variety of the living world.

From Booklist A challenger of the orthodox "neo-Darwinist" interpretation of evolution, microbiologist Margulis has made her professional mark touting an alternative: symbiogenesis. She and coauthor (and son) Sagan have presented their ideas in earlier popular works (*What Is Life?*, 1995), but never as vigorously as in this volume. Essentially, the debate between neo-Darwinists and Margulis hinges on the definition of a species, and the manner in which a new one appears. To Margulis and Sagan, the neo-Darwinist model, which asserts random gene mutation as the source of

inherited variations, is "wildly overemphasized," and to support their view, they delve deeply into the world of microbes. They detail the anatomy of cells with and without nuclei, positing a process of genome ingestion that creates a new species. Surprisingly, the upshot of Margulis' theories is the rehabilitation of Jean Baptiste de Lamarck, whose theory that supposedly acquired traits are hereditary has been ridiculed for 150 years. Polemical and provocative, Margulis and Sagan's work should set many to thinking that evolution has not yet been completely figured out. Gilbert Taylor
Copyright American Library Association. All rights reserved "One of the most stimulating and provocative books that I have read for a long while." About the Author Lynn Margulis, Distinguished University Professor in the Department of Geosciences, University of Massachusetts, Amherst, is a member of the National Academy of Sciences and a recipient of the 1999 Presidential Medal of Science. She lives in Amherst, Massachusetts. Dorion Sagan is the author of *Biospheres* and, with Dr. Eric Schneider, *Into the Cool: The New Thermodynamics of Life*. He lives in New York City.