The Logic of Chance: The Nature and Origin of Biological Evolution (FT Press Science)

Eugene V. Koonin
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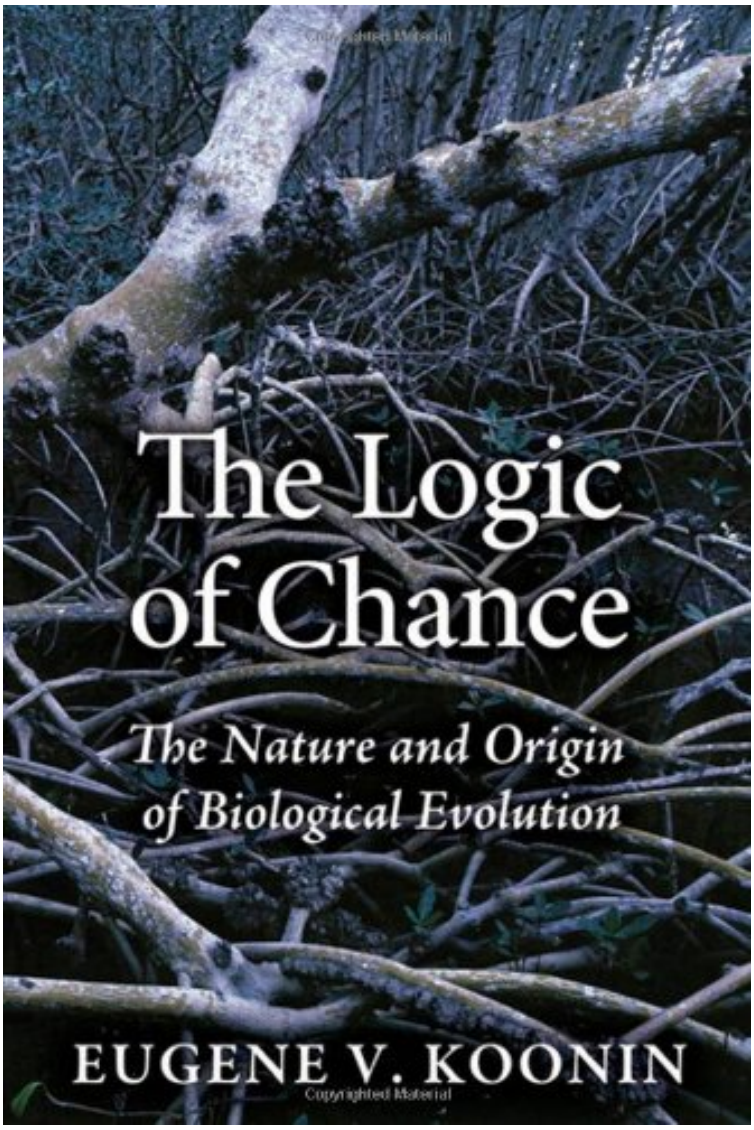

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Eugene V. Koonin : The Logic of Chance: The Nature and Origin of Biological Evolution (FT Press Science) before purchasing it in order to gage whether or not it would be worth my time, and all praised The Logic of Chance: The Nature and Origin of Biological Evolution (FT Press Science):

3 of 3 people found the following review helpful. Darwin improved (not abridged)By medfairThis is an in depth look

at the modern theory of evolution. A warning: not for the uninitiated. I am a PhD in Biochemistry and a retired professor of Pharmacology and the book was far from easy. However, if you are willing to put in the effort and educate yourself on the way whenever necessary, you get a fabulous and intriguing state of art overview of the greatest milestone in biology, or perhaps in all science. Dr. Kunin is basing his review mainly on the recent achievements in the genetics of microorganisms, particularly primitive bacteria and viruses. Highlights:1. No more infinitely small one base mutations to eventually achieve a new improved protein with the same, or even different function. Instead horizontal gene transfer for the lowly microorganisms, or gene duplication for the lofty eukaryotes. In both case, the organism purchases an entire protein or even a whole set of genes to play with.2. The shift from the ancient RNA world to the "modern" protein world requires ribosomes, minute sub-cellular machines that synthesize proteins. However, there is no model that may explain a gradual emergence of the ribosome. What then? God? ETs? Creationists might have some fun with this problem.3. Certain aspects of evolution appear to be DIRECTED (!!!) rather than random. This is a real whopper, even more than the unexplained/unexplainable appearance of the ribosome.A must for a 21st century woman or man of culture and knowledge.15 of 16 people found the following review helpful. Heavy but very thought provoking readBy Alex SamarasThis book is targeted at the experts but can be understood well enough by knowledgeable amateurs with some background in genomics (even unofficial; mine comes from my hobby of reading research papers because I am fascinated with biology). Having already read a good number of Dr. Koonin's papers as well as several others referenced in the book helped.Anyway, this was a fascinating, thought-provoking read, though it was also rather difficult. Koonin's writing style, which serves him quite well in academic papers, doesn't translate extremely well to a full length book. For the sake of comparison, because both books seem to be targeted at a similar level crowd, it is not as readable as "The Extended Phenotype" by Richard Dawkins.However, the ideas are fascinating, and this book seems to be an excellent overview of modern genomics research and what it tells us about what we understand and misunderstand about evolution. I certainly learned a lot about these topics as well as directions that future research will be taking. While I was less than impressed with some of the conclusions near the end (for example, the appeal to MWO and weak Anthropic Principal seemed to me to be a cop-out and at best should be a hypothesis of last resort).However, I am not an expert, just an interested knowledgeable amateur, so I am not in the best position to judge Dr. Koonin's interpretations of the various data and research. But, whether his interpretations are spot on or not, they are certainly quite thought provoking, and will certainly serve science by creating discussion and lying groundwork for real testable hypotheses of all of the topics of genomics and evolution he discussed.If you are very interested in biology, genetics, genomics, and evolution, you will want to read this book.1 of 1 people found the following review helpful. Great book, but only for expertsBy JasonThe Logic of Chance is probably the best biology monograph in the last hundred years. Way better than Gould or Dawkins in terms of actually understanding and making inferences from evolutionary theory and data. However, as Koonin freely admits in the introduction, this book is only approachable by those who already have a reasonable understanding of the field-specific jargon. Maybe undergrads might attempt it but this is really meant for those with PhDs or planning on getting one soon.There's really no need to read the chapters in order and I found myself doing a lot of flipping back and forth and bookmarking pages--for that I wish I'd bought the physical copy. Plus then I could lend it around.

The Logic of Chance offers a reappraisal and a new synthesis of theories, concepts, and hypotheses on the key aspects of the evolution of life on earth in light of comparative genomics and systems biology. The author presents many specific examples from systems and comparative genomic analysis to begin to build a new, much more detailed, complex, and realistic picture of evolution. The book examines a broad range of topics in evolutionary biology including the inadequacy of natural selection and adaptation as the only or even the main mode of evolution; the key role of horizontal gene transfer in evolution and the consequent overhaul of the Tree of Life concept; the central, underappreciated evolutionary importance of viruses; the origin of eukaryotes as a result of endosymbiosis; the concomitant origin of cells and viruses on the primordial earth; universal dependences between genomic and molecular-phenomic variables; and the evolving landscape of constraints that shape the evolution of genomes and molecular phenomes. "Koonin's account of viral and pre-eukaryotic evolution is undoubtedly up-to-date. His "mega views" of evolution (given what was said above) and his cosmological musings, on the other hand, are interesting reading." Summing Up: Recommended Reprinted with permission from CHOICE, copyright by the American Library Association.

From the Back Cover An Outline of a Fundamentally New Evolutionary Synthesis Reflecting Key Advances in Genomics, Systems Biology, and Biological Physics In this ambitious book, Eugene V. Koonin illuminates the gamut of randomness and regularity that is at the heart of life. Pointing the way beyond Modern Synthesis, Koonin brings together new data and concepts in an attempt to achieve a far deeper understanding of the interplay between chance and necessity that drives biological evolution. He explains evolution as a stochastic process based on historical contingency, constrained by requirements for maintaining cell organization and modulated by adaptation. To support his argument, he weaves together multiple conceptual threads: genomic comparisons that illuminate ancestral forms;

new insights into pattern, process, and contingency in evolution; advances in the study of gene expression, protein abundance, and other phenotypic molecular characteristics; application of statistical physics to the study of the evolution of genes and genomes; and new perspectives on probability now emerging from modern cosmology. The Logic of Chance shows why these insights make the twentieth-century scientific consensus about evolution appear outdated and incomplete and outlines a fundamentally new approach: one that is challenging, sometimes controversial, and always firmly rooted in hard science. Coverage includes Understanding the forces and patterns of evolution