

Evolutionary Essays

A THERMODYNAMIC INTERPRETATION OF THE EVOLUTION



SVEN E. JØRGENSEN

Evolutionary Essays A Thermodynamic Interpretation Of The Evolution

Bruce Clarke, Manuela Rossini

Evolutionary Essays A Thermodynamic Interpretation Of The Evolution:

Evolutionary Essays Sven Erik Jørgensen, 2011-04-18 Evolution is nature s most fascinating process the possibility given sufficient time to combine simple inorganic compounds to more and more complex biochemical compounds which make up more and more complex organisms. It is therefore crucial in our effort to understand the evolution to see it from as many different angles as possible This books draw an image of evolution from the thermodynamic viewpoint which gives new and surprising insights into the processes and mechanisms that have driven evolution This new thermodynamic interpretation has made it possible to quantify the various steps of evolution and to show that evolution has followed an exponential growth curve The first comprehensive thermodynamic interpretation and explanation of evolution This thermodynamic interpretation makes it possible to quantify the various steps of evolution This interpretation explains the wide spectrum of different mechanisms on which the evolution has been based Walden's Shore Robert M. Thorson, 2014-01-06 Walden's Shore explores Thoreau s understanding of the living rock on which life s complexity depends not as metaphor but as physical science Robert Thorson's subject is Thoreau the rock and mineral collector interpreter of landscapes and field scientist whose compass and measuring stick were as important to him as his plant press Global Ecology Sven Erik Jørgensen, 2010-04-16 Global Ecology focuses on the perception of the biosphere or the ecosphere as a unified cooperative system with numerous synergistic effects which describe the distinctive properties of this sphere This book is subdivided into five parts dealing with diverse aspects in global ecology The first part of the book provides comprehensive description of the biosphere including its unique characteristics and evolution This part also describes various spheres in the biosphere such as the hydrosphere noosphere and pedosphere as well as their composition. The next part focuses on the global cycles including calcium carbon iron microbial nitrogen oxygen phosphorus sulfur and water cycles In addition global balances and flows are explained Presented in the third part are the results of the global cycles and flows as well as the patterns of the climatic factors and marine currents There is also a part discussing the climate interactions climatic changes and its effect on the living organisms The book concludes by covering the application of stoichiometry in the biosphere and in ecosystems The book offers a comprehensive view of global ecology and ecological stoichiometry which will aid in the processes of global ecology Provides an overview of the theory and application of global ecology International focus and range of ecosystems makes Global Ecology an indispensable resource to scientists Based on the bestselling Encyclopedia of Ecology Full color figures and tables support the text and aid in understanding Ecosystem Ecology Sven Erik Jørgensen, 2009-07-25 Jorgensen's Ecosystem Ecology provides a thorough and comprehensive overview of the world's aquatic and terrestrial ecosystems This derivative volume based on the best selling Encyclopedia of Ecology published 2008 is the only book currently published that provides an overview of the world's ecosystems in a concise format Provides an overview of the world's ecosystems in a concise format Covers aquatic and terrestrial ecosystems Based on the best selling Encyclopedia of

Ecology Full color figures and tables support the text and aid in understanding **Encyclopedia of Ecology** Brian D. Fath, 2018-08-23 Encyclopedia of Ecology Second Edition Four Volume Set continues the acclaimed work of the previous edition published in 2008 It covers all scales of biological organization from organisms to populations to communities and ecosystems Laboratory field simulation modelling and theoretical approaches are presented to show how living systems sustain structure and function in space and time New areas of focus include micro and macro scales molecular and genetic ecology and global ecology e g climate change earth transformations ecosystem services and the food water energy nexus are included In addition new international experts in ecology contribute on a variety of topics Offers the most broad ranging and comprehensive resource available in the field of ecology Provides foundational content and suggests further reading Incorporates the expertise of over 500 outstanding investigators in the field of ecology including top young scientists with both research and teaching experience Includes multimedia resources such as an Interactive Map Viewer and links to a CSDMS Community Surface Dynamics Modeling System an open source platform for modelers to share and link models dealing with earth system processes The Lab's Quarterly/Il Trimestrale del Laboratorio (2009,1), Within Limits to Growth Sven Erik Jørgensen, Brian D. Fath, Søren Nors Nielsen, Federico M. Pulselli, Daniel A. Fiscus, Simone Bastianoni, 2015-07-03 Decades of research and discussion have shown that the human population growth and our increased consumption of natural resources cannot continue there are limits to growth This volume demonstrates how we might modify and revise our economic systems using nature as a model The book describes how nature uses three growth forms biomass information and networks resulting in improved overall ecosystem functioning and co development As biomass growth is limited by available resources nature uses the two other growth forms to achieve higher resource use efficiency Through a universal application of the three R s reduce reuse and recycle nature thus shows us a way forward towards better solutions However our current approach dominated by short term economic thinking inhibits full utilization of the three R s and other successful approaches from nature Building on ecological principles the authors present a global model and futures scenario analyses which show that implementation of the proposed changes will lead to a win win situation In other words we can learn from nature how to develop a society that can flourish within the limits to growth with better conditions for prosperity and well being Essays on the Extended Evolutionary Synthesis Rodrick Wallace, 2023-05-18 From the punctuated equilibrium of Eldrege and Gould through Lewontin's triple helix and the various visions and revisions of the Extended Evolutionary Synthesis EES of Laland and others both data and theory have demanded an opening up of the 1950 s Evolutionary Synthesis that so firmly wedded evolutionary theory to the mathematics of gene frequency analysis It can however be argued that a single deep and comprehensive mathematical theory may simply not be possible for the almost infinite varieties of evolutionary process active at and across the full range of scales of biological social institutional and cultural phenomena Indeed the case history of meme theory should have raised a red flag that narrow gene centered models

of evolutionary process may indeed have serious limitations What is attempted here is less grand but still broader than a gene centered analysis Following the instruction of Maturana and Varela that all living systems are cognitive in a certainsense and that living as a process is a process of cognition the asymptotic limit theorems of information and control theories that bound all cognition provide a basis for constructing an only modestly deep but wider ranging series of probability models that might be converted into useful statistical tools for the analysis of observational and experimental data related to evolutionary process The line of argument in this series of interrelated essays proves to be surprisingly direct

The Routledge Companion to Literature and Science Bruce Clarke, Manuela Rossini, 2010-09-13 With forty four newly commissioned articles from an international cast of leading scholars The Routledge Companion to Literature and Science traces the network of connections among literature science technology mathematics and medicine Divided into three main sections this volume links diverse literatures to scientific disciplines from Artificial Intelligence to Thermodynamics surveys current theoretical and disciplinary approaches from Animal Studies to Semiotics traces the history and culture of literature and science from Greece and Rome to Postmodernism Ranging from classical origins and modern revolutions to current developments in cultural science studies and the posthumanities this indispensible volume offers a comprehensive resource for undergraduates postgraduates and researchers With authoritative accessible and succinct treatments of the sciences in their literary dimensions and cultural frameworks here is the essential guide to this vibrant area of study

Functional Models of Cognition A. Carsetti,2013-11-11 Our ontology as well as our grammar are as Quine affirms ineliminable parts of our conceptual contribution to our theory of the world It seems impossible to think of enti ties individuals and events without specifying and constructing in advance a specific language that must be used in order to speak about these same entities We really know only insofar as we regiment our system of the world in a consistent and adequate way At the level of proper nouns and existence functions we have for instance a standard form of a regimented language whose complementary apparatus consists of predicates variables quantifiers and truth functions If for instance the discoveries in the field of Quantum Mechanics should oblige us in the future to abandon the traditional logic of truth functions the very notion of existence as established until now will be chall lenged These considerations as developed by Quine introduce us to a conceptual perspective like the internal realist perspective advocated by Putnam whose principal aim is for cer tain aspects to link the philosophical approaches developed respectively by Quine and Wittgenstein Actually Putnam conservatively extends the approach to the problem of ref erence outlined by Quine in his opinion to talk of facts without specifying the language to be used is to talk of nothing Back To Darwin John B. Cobb,2008-02-04 This book provides a distinctive radical way beyond the quarrels between evolutionary science and Christian belief Leading scientists philosophers and theologians critically discuss the metaphysical assumptions of neo Darwinism and offer concrete ways of broadening mainstream evolutionary theory Their open exchange moderated by veteran process theologian John B Cobb

presents a holistic case for evolution that both theists and nontheists can accept Contributors Francisco J Ayala Ian G Barbour Charles Birch Philip Clayton John B Cobb Jr John Greene David Ray Griffin A Y Gunter John F Haught Lynn Margulis Reg Morrison Dorion Sagan Jeffrey Schloss Robert J Valenza Howard J Van Till Evolutionary Systems G. Vijver, Stanley N. Salthe, M. Delpos, 2013-04-17 The three well known revolutions of the past centuries the Copernican the Darwinian and the Freudian each in their own way had a deflating and mechanizing effect on the position of humans in nature They opened up a richness of disillusion earth acquired a more modest place in the universe the human body and mind became products of a long material evolutionary history and human reason instead of being the central immaterial locus of understanding was admitted into the theater of discourse only as a materialized and frequently out of control actor Is there something objectionable to this picture Formulated as such probably not Why should we resist the idea that we are in certain ways and to some degree physically biologically or psychically determined Why refuse to acknowledge the fact that we are materially situated in an ever evolving world Why deny that the ways of inscription traces of past events and processes are co determinative of further evolutionary pathways Why minimize the idea that each intervention of each natural being is temporally and materially situated and has as such the inevitable consequence of changing the world The point is however that there are many more or less radically different ways to consider the mechanization of man and nature There are in particular many ways to get the message of material and evolutionary determination as well as many levels at which this determination can be thought of as relevant or irrelevant Popularizing Science and Technology in the European Periphery, 1800-2000 Dr Agustí Nieto-Galan, Dr Enrique Perdiguero, Dr Faidra Papanelopoulou, 2013-06-28 The vast majority of European countries have never had a Newton Pasteur or Einstein Therefore a historical analysis of their scientific culture must be more than the search for great luminaries Studies of the ways science and technology were communicated to the public in countries of the European periphery can provide a valuable insight into the mechanisms of the appropriation of scientific ideas and technological practices across the continent The contributors to this volume each take as their focus the popularization of science in countries on the margins of Europe who in the nineteenth and twentieth centuries may be perceived to have had a weak scientific culture A variety of scientific genres and forums for presenting science in the public sphere are analysed including botany and women teaching and popularizing physics and thermodynamics scientific theatres national and international exhibitions botanical and zoological gardens popular encyclopaedias popular medicine and astronomy and genetics in the press Each topic is situated firmly in its historical and geographical context with local studies of developments in Spain Portugal Italy Hungary Denmark Belgium and Sweden Popularizing Science and Technology in the European Periphery provides us with a fascinating insight into the history of science in the public sphere and will contribute to a better understanding of the circulation of scientific knowledge **Development and Evolution** Stanley N. Salthe, 1993 Development and Evolution surveys and illuminates the key themes of rapidly changing fields and areas of controversy that

the redefining the theory and philosophy of biology It continues Stanley Salthe's investigation of evolutionary theory begun in his influential book Evolving Hierarchical Systems while negating the implicit philosophical mechanisms of much of that work Here Salthe attempts to reinitiate a theory of biology from the perspective of development rather than from that of evolution recognizing the applicability of general systems thinking to biological and social phenomena and pointing towards a non Darwinian and even a postmodern biology The Structure of Evolutionary Theory Stephen Jay Gould, 2002-03-21 The world s most revered and eloquent interpreter of evolutionary ideas offers here a work of explanatory force unprecedented in our time a landmark publication both for its historical sweep and for its scientific vision With characteristic attention to detail Stephen Jav Gould first describes the content and discusses the history and origins of the three core commitments of classical Darwinism that natural selection works on organisms not genes or species that it is almost exclusively the mechanism of adaptive evolutionary change and that these changes are incremental not drastic Next he examines the three critiques that currently challenge this classic Darwinian edifice that selection operates on multiple levels from the gene to the group that evolution proceeds by a variety of mechanisms not just natural selection and that causes operating at broader scales including catastrophes have figured prominently in the course of evolution Then in a stunning tour de force that will likely stimulate discussion and debate for decades Gould proposes his own system for integrating these classical commitments and contemporary critiques into a new structure of evolutionary thought In 2001 the Library of Congress named Stephen Jay Gould one of America's eighty three Living Legends people who embody the quintessentially American ideal of individual creativity conviction dedication and exuberance Each of these qualities finds full expression in this peerless work the likes of which the scientific world has not seen and may not see again for well over a century The Teilhard Review ,1969

Maximum Power and its Philosophical Roots Timothy McWhirter,2025-02-10 This Briefs volume focuses on the maximum power principle which was created by the mathematician and physical chemist Alfred Lotka and further developed and utilized most prominently by the systems ecologist H T Odum who applied it to different physical biological ecological and economic systems They both described this principle providing a thermodynamic framework for evolutionary theory This principle has a philosophical heritage that has until now gone unrecognized The 19th century philosopher Friedrich Nietzsche viewed his concept of the will to power as an empirical principle that describes how organic and inorganic systems develop in ways that grow in power This book describes this interdisciplinary story it discusses the development of both principles reviews the empirical and theoretical support for them critically examines their alleged limitations and describes their philosophical implications evidenced in a particularly provocative manner by Nietzsche's and Odum's critiques of moral and religious values

An Informed Cosmos Peter S. Williams, 2023-07-14 After a substantial author's preface recounting the author's life journey with the question of science and design in nature An Informed Cosmos pulls together essays that jointly cover the core arguments for a scientific theory of intelligent design Along with a foreword by philosopher of science

and leading design theorist Stephen C Meyer and a wide range of recommended resources An Informed Cosmos offers an informed overview of the contemporary case for intelligent design Information And Computation: Essays On Scientific And Philosophical Understanding Of Foundations Of Information And Computation Gordana Dodig-crnkovic, Mark Burgin, 2011-06-10 Information is a basic structure of the world while computation is a process of the dynamic change of information This book provides a cutting edge view of world's leading authorities in fields where information and computation play a central role It sketches the contours of the future landscape for the development of our understanding of information and computation their mutual relationship and the role in cognition informatics biology artificial intelligence and information technology This book is an utterly enjoyable and engaging read which gives readers an opportunity to understand and relate phenomena seemingly unrelated in a completely new light especially the connections between information computation cognition and life On Semiotic Modeling Myrdene Anderson, Floyd Merrell, 2014-01-02 No detailed description available for On Semiotic Modeling

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