

EVOLUTIONARY BIOLOGY

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Evolutionary Biology volume 16

T. Dobzhansky



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Evolutionary Biology Max K. Hecht, Ross J. MacIntyre, Michael T. Clegg, 2012-12-06 This volume is the twenty ninth in this series which includes twenty eight numbered volumes and one unnumbered supplement The editors continue to focus on critical reviews commentaries original papers and controversies in of the reviews range from anthropology to evolutionary biology The topics molecular evolution population biology to paleobiology Recent volumes have included a broad spectrum of chapters on such subjects as population biology comparative morphology paleobiology molecular phylogenetics developmental evolutionary biology

systematics and the history of evolutionary biology The editors continue to solicit manuscripts in all areas of evolutionary biology Manuscripts should be sent to anyone of the following Max K Hecht Department of Biology Queens College of the City University of New York Flushing New York 11367 Ross 1 MacIntyre Department of Genetics and Development Cornell University Ithaca New York 14853 or Michael T Clegg Department of Botany and Plant Sciences University of California Riverside California 92521 vii Contents 1 Homology and Embryonic Development Brian K Hall Introduction 1 A Brief History of the Concept of Homology 1 von Baer s Laws 4 Germ Layers and Ernst Haeckel 6 Embryology and Homology 7 Homology An Unsolved Problem 8 Latent Homology 8 Serial Homology 9 Common Origins and Common Inductions 12 Mechanisms of Gastrulation 13 Origin of the Alimentary Canal 14 Origin of Germ Cells 14 Induction of Meckel s Cartilage 15 Induction of the Lens of the Eye 16 Development of Internal and External Cheek Pouches 18 Selection for Increased Tail Length in Mice 19 Regeneration and Homology 20

The Evolutionary Biology of Plants Karl J. Niklas, 1997-06-08 Provides a comprehensive synthesis of modern evolutionary biology as it relates to plants This text recounts the saga of plant life from its origins to the radiation of the flowering plants Through computer generated walks it shows how living plants might have evolved **From Strange Simplicity to Complex Familiarity** Manfred Eigen, 2013-05-23 This book presents a vivid argument for the almost lost idea of a unity of all natural sciences It starts with the strange physics of matter including particle physics atomic physics and quantum mechanics cosmology relativity and their consequences Chapter I and it continues by describing the properties of material systems that are best understood by statistical and phase space concepts Chapter II These lead to entropy and to the classical picture of quantitative information initially devoid of value and meaning Chapter III Finally information space and dynamics within it are introduced as a basis for semantics Chapter IV leading to an exploration of life and thought as new problems in physics Chapter V Dynamic equations again of a strange but very general nature bring about the complex familiarity of the world we live in Surprising new results in the life sciences open our eyes to the richness of physical thought and they show us what can and what cannot be explained by a Darwinian approach The abstract physical approach is applicable to the origins of life of meaningful information and even of our universe **RNA Genetics** Esteban Domingo, 2018-02-06 First Published in 2018 Routledge is an imprint of Taylor Francis an Informa company Flowering Plants Armen Takhtajan, 2009-07-06 Armen Takhtajan is among the greatest authorities in the world on the evolution of plants This book culminates almost sixty years of the scientist s research of the origin and classification of the flowering plants It presents a continuation of Dr Takhtajan s earlier publications including *Systema Magnoliophytorum* 1987 in Russian and *Diversity and Classification of Flowering Plants* 1997 in English In his latest book the author presents a concise and significantly revised system of plant classification Takhtajan system based on the most recent studies in plant morphology embryology phytochemistry cytology molecular biology and palynology Flowering plants are divided into two classes class Magnoliopsida or Dicotyledons includes 8 subclasses 126 orders c 440 families almost 10 500 genera and no less than 195

000 species and class Liliopsida or Monocotyledons includes 4 subclasses 31 orders 120 families more than 3 000 genera and about 65 000 species This book contains a detailed description of plant orders and descriptive keys to plant families providing characteristic features of the families and their differences Crocodiles International Union for Conservation of Nature and Natural Resources. Crocodile Specialist Group. Working Meeting,1986 *The Masterpiece of Nature* Graham Bell,2019-11-28 Originally published in 1982 The Masterpiece of Nature examines sex as representative of the most important challenge to the modern theory of evolution The book suggests that sex evolved not as the result of normal Darwinian processes of natural selection but through competition between populations or species a hypothesis elsewhere almost universally discredited The book also discusses the nature of sex and its consequences for the individual and for the population as well as various other theories of sex Since the value of these theories is held to reside wholly in their ability to predict the patterns of sexuality observed in nature the book seeks to provide an extensive review of the circumstances in which sexuality is attenuated or lost throughout the animal kingdom and these facts are then used to weigh up the merits of the rival theories This book will be of interest to researchers in the area of genetics ecology and evolutionary biology

Evolutionary Biology T. Dobzhansky,1975-01-01

Statistics for Bioinformatics Julie Thompson,2016-11-24

Statistics for Bioinformatics Methods for Multiple Sequence Alignment provides an in depth introduction to the most widely used methods and software in the bioinformatics field With the ever increasing flood of sequence information from genome sequencing projects multiple sequence alignment has become one of the cornerstones of bioinformatics Multiple sequence alignments are crucial for genome annotation as well as the subsequent structural functional and evolutionary studies of genes and gene products Consequently there has been renewed interest in the development of novel multiple sequence alignment algorithms and more efficient programs Explains the dynamics that animate health systems Explores tracks to build sustainable and equal architecture of health systems Examines the advantages and disadvantages of the different approaches to care integration and the management of health information *Emerging Syntheses In Science* David Pines,2018-03-05 Evolution of self replicating macromolecules through natural selection is a dynamically ordered process Two concepts are introduced to describe the physical regularity of macromolecular evolution sequence space and quasi species Natural selection means localization of a mutant distribution in sequence space This localized distribution called the quasi species is centered around a master sequence or a degenerate set that the biologist would call the wild type The self ordering of such a system is an essential consequence of its formation through self reproduction of its macromolecular constituents a process that in the dynamical equations expresses itself by positive diagonal coefficients called selective values The theory describes how population numbers of wild type and mutants are related to the distribution of selective values that is to say how value topography maps into population topography For selectively nearly neutral mutants appearing in the quasi species distribution population numbers are greatly enhanced as compared to those of disadvantageous mutants even more

so in continuous domains of such selectively valuable mutants As a consequence mutants far distant from the wild type may occur because they are produced with the help of highly populated less distant precursors Since values are cohesively distributed like mountains on earth and since their positions are multiply connected in the high dimensional sequence space the overpopulation of nearly neutral mutants provides guidance for the evolutionary process Localization in sequence space subject to a threshold in the fidelity of reproduction is steadily challenged until an optimal state is reached The model has been designed according to experimentally determined properties of self replicating molecules The conclusions reached from the theoretical models can be used to construct machines that provide optimal conditions for the evolution of functional macromolecules

Interrogating Human Origins Martin Porr, Jacqueline Matthews, 2019-12-06 *Interrogating Human Origins* encourages new critical engagements with the study of human origins broadening the range of approaches to bring in postcolonial theories and begin to explore the decolonisation of this complex topic The collection of chapters presented in this volume creates spaces for expansion of critical and unexpected conversations about human origins research Authors from a variety of disciplines and research backgrounds many of whom have strayed beyond their usual disciplinary boundaries to offer their unique perspectives all circle around the big questions of what it means to be and become human Embracing and encouraging diversity is a recognition of the deep complexities of human existence in the past and the present and it is vital to critical scholarship on this topic This book constitutes a starting point for increased interrogation of the important and wide ranging field of research into human origins It will be of interest to scholars across multiple disciplines and particularly to those seeking to understand our ancient past through a more diverse lens

Feeding Kurt Schwenk, 2000-08-03 As the first four legged vertebrates called tetrapods crept up along the shores of ancient primordial seas feeding was among the most paramount of their concerns Looking back into the mists of evolutionary time fish like ancestors can be seen transformed by natural selection and other evolutionary pressures into animals with feeding habitats as varied as an anteater and a whale From frog to pheasant and salamander to snake every lineage of tetrapods has evolved unique feeding anatomy and behavior Similarities in widely divergent tetrapods vividly illustrate their shared common ancestry At the same time numerous differences between and among tetrapods document the power and majesty that comprises organismal evolutionary history Feeding is a detailed survey of the varied ways that land vertebrates acquire food The functional anatomy and the control of complex and dynamic structural components are recurrent themes of this volume Luminaries in the discipline of feeding biology have joined forces to create a book certain to stimulate future studies of animal anatomy and behavior

[Origin and Evolution of Biodiversity](#) Pierre Pontarotti, 2018-08-27 The book includes 19 selected contributions presented at the 21st Evolutionary Biology Meeting which took place in Marseille in September 2017 The chapters are grouped into the following five categories Genome Phenotype Evolution Self Nonself Evolution Origin of Biodiversity Origin of Life Concepts The annual Evolutionary Biology Meetings in Marseille serve to gather leading

evolutionary biologists and other scientists using evolutionary biology concepts e g for medical research The aim of these meetings is to promote the exchange of ideas to encourage interdisciplinary collaborations Offering an up to date overview of recent findings in the field of evolutionary biology this book is an invaluable source of information for scientists teachers and advanced students

Life's Solution Simon Conway Morris, 2003-09-04 The assassin's bullet misses the Archduke's carriage moves forward and a catastrophic war is avoided So too with the history of life Re-run the tape of life as Stephen J Gould claimed and the outcome must be entirely different an alien world without humans and maybe not even intelligence The history of life is littered with accidents any twist or turn may lead to a completely different world Now this view is being challenged Simon Conway Morris explores the evidence demonstrating life's almost eerie ability to navigate to a single solution repeatedly Eyes brains tools even culture all are very much on the cards So if these are all evolutionary inevitabilities where are our counterparts across the galaxy The tape of life can only run on a suitable planet and it seems that such Earth-like planets may be much rarer than hoped Inevitable humans yes but in a lonely Universe

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

Evolutionary Computation David B. Fogel, 2006-09-18 This Third Edition provides the latest tools and techniques that enable computers to learn The Third Edition of this internationally acclaimed publication provides the latest theory and techniques for using simulated evolution to achieve machine intelligence As a leading advocate for evolutionary computation the author has successfully challenged the traditional notion of artificial intelligence which essentially programs human knowledge fact by fact but does not have the capacity to learn or adapt as evolutionary computation does Readers gain an understanding of the history of evolutionary computation which provides a foundation for the author's thorough presentation of the latest theories shaping current

research Balancing theory with practice the author provides readers with the skills they need to apply evolutionary algorithms that can solve many of today's intransigent problems by adapting to new challenges and learning from experience Several examples are provided that demonstrate how these evolutionary algorithms learn to solve problems In particular the author provides a detailed example of how an algorithm is used to evolve strategies for playing chess and checkers As readers progress through the publication they gain an increasing appreciation and understanding of the relationship between learning and intelligence Readers familiar with the previous editions will discover much new and revised material that brings the publication thoroughly up to date with the latest research including the latest theories and empirical properties of evolutionary computation The Third Edition also features new knowledge building aids Readers will find a host of new and revised examples New questions at the end of each chapter enable readers to test their knowledge Intriguing assignments that prepare readers to manage challenges in industry and research have been added to the end of each chapter as well This is a must have reference for professionals in computer and electrical engineering it provides them with the very latest techniques and applications in machine intelligence With its question sets and assignments the publication is also recommended as a graduate level textbook

Implant Dentistry Ilser Turkyilmaz, 2011-08-29 Implant dentistry has come a long way since Dr Branemark introduced the osseointegration concept with endosseous implants The use of dental implants has increased exponentially in the last three decades As implant treatment became more predictable the benefits of therapy became evident The demand for dental implants has fueled a rapid expansion of the market Presently general dentists and a variety of specialists offer implants as a solution to partial and complete edentulism Implant dentistry continues to evolve and expand with the development of new surgical and prosthodontic techniques The aim of Implant Dentistry A Rapidly Evolving Practice is to provide a contemporary clinic resource for dentists who want to replace missing teeth with dental implants It is a text that relates one chapter to every other chapter and integrates common threads among science clinical experience and future concepts This book consists of 23 chapters divided into five sections We believe that Implant Dentistry A Rapidly Evolving Practice will be a valuable source for dental students post graduate residents general dentists and specialists who want to know more about dental implants

Phylonyms Kevin de Queiroz, Philip D. Cantino, Jacques A. Gauthier, 2020-04-30 Phylonyms is an implementation of PhyloCode which is a set of principles rules and recommendations governing phylogenetic nomenclature Nearly 300 clades lineages of organisms are defined by reference to hypotheses of phylogenetic history rather than by taxonomic ranks and types This volume will document the Real World uses of PhyloCode and will govern and apply to the names of clades while species names will still be governed by traditional codes Key Features Provides clear regulations for implementing new guidelines for naming lineages of organisms incorporates expressly evolutionary and phylogenetic principles Works with existing codes of nomenclature Eliminates the reliance on rank based classification in favor of phylogenetic relationships Related Titles Rieppel O Phylogenetic Systematics Haeckel to Hennig ISBN 978 1 4987 5488 0

Cantino P D and de Queiroz K International Code of Phylogenetic Nomenclature PhyloCode ISBN 978 1 138 33282 9

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