

bergstrom and dugatkin evolution

bergstrom and dugatkin evolution is a cornerstone resource for understanding evolutionary biology in the modern age. This comprehensive article explores the influential work of Carl T. Bergstrom and Lee Alan Dugatkin, whose collaborative contributions have shaped how students and professionals approach evolutionary theory today. Covering their innovative perspectives on natural selection, adaptation, cooperation, and the application of evolutionary principles to real-world challenges, this article provides an in-depth look at their textbook, methods, and impact on the field. Whether you're a student, educator, or science enthusiast, you'll gain valuable insights into the mechanisms of evolution, the importance of scientific inquiry, and the relevance of evolutionary concepts across disciplines. Read on to discover detailed explanations, practical examples, and essential knowledge about bergstrom and dugatkin evolution.

- Comprehensive Overview of Bergstrom and Dugatkin's Approach to Evolution
- Key Themes in Bergstrom and Dugatkin's Evolution Textbook
- Major Concepts Explained: Natural Selection, Adaptation, and More
- The Role of Cooperation and Social Evolution
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Comprehensive Overview of Bergstrom and Dugatkin's Approach to Evolution

Bergstrom and Dugatkin's work on evolution stands out for its clarity, accessibility, and emphasis on both foundational and cutting-edge topics. Their approach integrates classic evolutionary theory with examples from contemporary research, making difficult concepts understandable through engaging narratives and practical applications. By combining a rigorous scientific foundation with relatable case studies, their textbook has become a standard for teaching and learning evolution at undergraduate and graduate levels.

Their perspective is unique in highlighting not just the mechanics of evolution but also the process of scientific inquiry itself. Emphasizing

hypothesis testing, critical analysis, and the dynamic nature of scientific understanding, Bergstrom and Dugatkin provide readers with the skills to evaluate evidence and think like evolutionary biologists. This comprehensive approach ensures that students gain a deep understanding of both the principles and the practice of evolutionary science.

- Integration of classic and modern evolutionary theory
- Focus on scientific methodology and critical thinking
- Use of real-world examples and case studies
- Accessible explanations for complex concepts

Key Themes in Bergstrom and Dugatkin's Evolution Textbook

The textbook authored by Bergstrom and Dugatkin has established itself as a leading resource in evolutionary biology education. It is organized around key themes that reflect the structure of biological thought and current research directions. These themes not only provide a conceptual framework for understanding evolution but also encourage students to think beyond memorization and engage with the process of scientific discovery.

Natural Selection and Adaptation

One of the central themes in Bergstrom and Dugatkin's evolution is the exploration of natural selection and adaptation. The authors present the classic Darwinian model, illustrating how environmental pressures lead to differential survival and reproduction. They use vivid examples from animal behavior, ecology, and genetics to demonstrate how adaptation arises over time and why it is a fundamental process in shaping biodiversity.

Genetic Variation and Population Genetics

Another major focus is genetic variation, which is the raw material for evolution. Bergstrom and Dugatkin explain how mutations, gene flow, and genetic drift contribute to diversity within populations. Population genetics is covered in detail, including mathematical models that describe how allele frequencies change, the role of selection, and the impact of random events.

Speciation and the Tree of Life

The textbook delves into the mechanisms of speciation, describing how new species arise and diverge from common ancestors. The authors emphasize the importance of reproductive isolation, genetic divergence, and the construction of phylogenetic trees to understand evolutionary relationships. These concepts are illustrated with diagrams and examples from a wide range of organisms.

Major Concepts Explained: Natural Selection, Adaptation, and More

Bergstrom and Dugatkin's evolution textbook is known for its clear explanations of major evolutionary concepts. Each chapter is carefully crafted to build understanding, starting with foundational ideas and moving toward advanced topics. The use of real-world examples and step-by-step reasoning helps students grasp the significance of each concept and its applications.

Mutation and Genetic Drift

Mutation is described as the ultimate source of genetic novelty, while genetic drift is presented as a powerful force in small populations. Bergstrom and Dugatkin highlight the stochastic nature of drift, showing how chance events can lead to significant evolutionary changes, especially in isolated or small groups.

Gene Flow and Migration

Gene flow, or the movement of genes between populations, is another key concept. The authors explain how migration affects genetic diversity, prevents speciation, and can introduce beneficial or deleterious alleles into populations. Examples from plants, animals, and microbes help illustrate these processes.

Selection Types: Directional, Stabilizing, and Disruptive

Natural selection comes in different forms, each with distinct evolutionary outcomes. Bergstrom and Dugatkin describe directional selection (favoring one

extreme), stabilizing selection (favoring intermediate traits), and disruptive selection (favoring both extremes). These mechanisms are exemplified through case studies in behavioral ecology, adaptation, and environmental change.

1. Directional selection: evolution toward one trait extreme
2. Stabilizing selection: maintaining average traits
3. Disruptive selection: favoring trait diversity

The Role of Cooperation and Social Evolution

A distinctive feature of Bergstrom and Dugatkin's evolution is its emphasis on cooperation and social evolution. Moving beyond competition, the authors explore how cooperative behaviors evolve through kin selection, reciprocal altruism, and group selection. These topics are vital for understanding not just animal societies but also human evolution and the development of complex social systems.

Kin Selection and Inclusive Fitness

Kin selection theory explains how organisms can increase their genetic success by helping relatives. Bergstrom and Dugatkin detail the mathematical basis for inclusive fitness, providing examples from insects, mammals, and birds. This concept challenges the traditional view of selfish gene behavior and shows the diversity of evolutionary strategies.

Reciprocal Altruism and Social Contracts

Reciprocal altruism describes how cooperation can arise between unrelated individuals. The textbook covers game theory models, such as the Prisoner's Dilemma, and demonstrates how trust and reputation influence evolutionary outcomes. Real-life examples from primates, humans, and other animals make these abstract ideas concrete.

Real-World Applications of Evolutionary Principles

Bergstrom and Dugatkin's approach highlights the relevance of evolutionary

theory to everyday life and modern challenges. Their work connects evolutionary concepts to fields such as medicine, agriculture, conservation, and technology. By applying principles of adaptation, selection, and genetic diversity, the authors show how evolution shapes solutions to pressing issues.

Evolutionary Medicine

The textbook explores how understanding evolution aids in combating infectious diseases, designing vaccines, and managing antibiotic resistance. Evolutionary medicine is presented as a dynamic field where principles of selection and adaptation guide clinical practices and research.

Conservation and Biodiversity

Bergstrom and Dugatkin discuss the role of evolution in preserving biodiversity and managing endangered species. They explain how genetic variation, population structure, and evolutionary potential are critical for conservation planning, ecosystem restoration, and combating the effects of climate change.

Critical Thinking and Scientific Inquiry in Evolutionary Biology

A hallmark of bergstrom and dugatkin evolution is the emphasis on scientific inquiry and critical thinking. The authors encourage readers to question assumptions, evaluate evidence, and consider alternative hypotheses. Their textbook includes exercises, thought experiments, and problem sets designed to foster analytical skills and a deeper understanding of the scientific process.

Hypothesis Testing and Experimental Design

Bergstrom and Dugatkin provide detailed guidance on how to frame hypotheses, design experiments, and interpret data. By integrating case studies from evolutionary research, they demonstrate the importance of rigorous methodology and reproducibility in scientific discovery.

Evaluating Evidence and Scientific Communication

The textbook teaches students how to assess the quality and reliability of scientific evidence. Bergstrom and Dugatkin emphasize the value of clear communication, peer review, and the role of skepticism in advancing knowledge. These skills are essential for careers in science, education, and policy.

Bergstrom and Dugatkin's Influence in Education and Research

Bergstrom and Dugatkin have made a lasting impact on evolutionary biology education and research. Their textbook has been adopted by universities worldwide, shaping curricula and inspiring new generations of scientists. Their research contributions span evolutionary theory, behavioral ecology, and the philosophy of science, influencing how evolutionary concepts are applied and understood.

Through workshops, lectures, and publications, Bergstrom and Dugatkin continue to promote excellence in teaching and expand the boundaries of evolutionary biology. Their collaborative approach and commitment to scientific rigor have set a standard for both education and research in the field.

- Global adoption of their textbook in higher education
- Influential research in evolutionary biology and animal behavior
- Promotion of interdisciplinary approaches and collaboration
- Ongoing contributions to science communication and outreach

Q&A: Trending and Relevant Questions about bergstrom and dugatkin evolution

Q: What makes bergstrom and dugatkin evolution textbook unique among other evolutionary biology resources?

A: The textbook stands out for its integration of classic and modern evolutionary theory, emphasis on scientific methodology, use of real-world

case studies, and accessible explanations. It encourages critical thinking and provides practical examples that help readers understand complex concepts.

Q: How do Bergstrom and Dugatkin address the concept of cooperation in evolution?

A: Bergstrom and Dugatkin explore cooperation through kin selection, reciprocal altruism, and group selection. They use mathematical models and behavioral examples to demonstrate how cooperative behaviors can evolve and persist in populations.

Q: What real-world applications are covered in bergstrom and dugatkin evolution?

A: The textbook applies evolutionary principles to fields such as medicine (evolutionary medicine), conservation biology, agriculture, and technology. It shows how understanding evolution can help solve issues like antibiotic resistance, biodiversity loss, and sustainable resource management.

Q: How do Bergstrom and Dugatkin promote critical thinking in their textbook?

A: They encourage students to question assumptions, evaluate evidence, and test hypotheses. Their textbook includes exercises and thought experiments designed to foster analytical skills and a deeper understanding of scientific inquiry.

Q: What role does genetic drift play in evolution according to Bergstrom and Dugatkin?

A: Genetic drift is described as a significant evolutionary force, especially in small populations. It refers to random changes in allele frequencies that can lead to genetic divergence and sometimes speciation, independent of natural selection.

Q: Why is population genetics emphasized in their textbook?

A: Population genetics provides the mathematical framework for understanding how evolutionary forces like selection, drift, mutation, and migration affect genetic variation. Bergstrom and Dugatkin use this approach to explain the dynamics of evolution in populations.

Q: How does the textbook address the process of speciation?

A: The textbook covers the mechanisms of speciation, including reproductive isolation, genetic divergence, and the formation of new species. It uses phylogenetic trees and examples from various organisms to illustrate evolutionary relationships.

Q: What impact have Bergstrom and Dugatkin had on evolutionary biology education?

A: Their textbook is widely adopted in universities, shaping curricula and inspiring students. Their research and teaching methods have influenced how evolutionary concepts are taught and understood globally.

Q: How does Bergstrom and Dugatkin's work emphasize the relevance of evolution to modern challenges?

A: By connecting evolutionary theory to real-world problems in medicine, conservation, and technology, their work highlights the practical importance of understanding adaptation, genetic diversity, and evolutionary processes in solving contemporary issues.

Q: What are the major types of natural selection discussed by Bergstrom and Dugatkin?

A: The textbook discusses directional selection (favoring one extreme trait), stabilizing selection (favoring intermediate traits), and disruptive selection (favoring extreme traits at both ends). Each type shapes population diversity in different ways.

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Bergstrom and Dugatkin's Evolution: A Deep Dive into

the Dynamics of Life's Processes

Evolution. A word that evokes images of Darwin's finches, the mighty Tyrannosaurus Rex, and the subtle shifts in genetic makeup across generations. But beyond the iconic visuals, lies a complex tapestry of biological mechanisms, mathematical models, and philosophical implications. This post delves into the influential work of Carl Bergstrom and Lee Dugatkin, exploring their contributions to our understanding of evolution and how their insights illuminate the intricate dance of life. We'll unpack their key concepts, demonstrating their relevance to contemporary evolutionary biology and beyond. Prepare to embark on a journey into the fascinating world of Bergstrom and Dugatkin's evolutionary thinking.

Understanding Bergstrom and Dugatkin's Collaborative Work

Bergstrom and Dugatkin, renowned biologists, aren't simply chroniclers of evolutionary theory; they are active participants in shaping its direction. Their collaboration has resulted in significant contributions, primarily through their insightful analyses and clear explanations of complex evolutionary processes. While they haven't co-authored a single, definitive work labeled "Bergstrom and Dugatkin on Evolution," their combined influence is profound. Their individual and collaborative efforts have illuminated crucial areas within evolutionary biology, enriching our understanding of adaptation, cooperation, and the dynamics of biological systems. Their work often emphasizes the power of mathematical models and game theory to explain seemingly paradoxical behaviors in nature.

1. The Power of Game Theory in Evolutionary Biology

One of the key areas where Bergstrom and Dugatkin's influence is evident is the application of game theory to evolutionary problems. Game theory provides a framework for understanding how organisms interact and make decisions in the context of competition and cooperation. They illustrate how seemingly altruistic behaviors, such as helping relatives, can evolve through the lens of inclusive fitness, a concept highlighting the propagation of shared genes through kin selection. Their work showcases how mathematical models can elegantly capture the complex interplay of costs and benefits in evolutionary scenarios, leading to clearer predictions and a deeper comprehension of observed patterns.

2. Evolutionary Arms Races and the Red Queen Hypothesis

The "Red Queen Hypothesis," a concept popularized by Leigh Van Valen, posits that organisms must constantly adapt and evolve simply to maintain their relative fitness in an ever-changing environment. Bergstrom and Dugatkin's work helps illuminate this continuous evolutionary struggle, particularly through their analyses of co-evolutionary dynamics. They analyze instances of evolutionary arms races, such as the predator-prey relationship, where ongoing adaptation in one species drives reciprocal adaptations in another, resulting in a continuous cycle of change. This intricate dance of adaptation is crucial in understanding biodiversity and the dynamic nature of ecological communities.

3. The Evolution of Cooperation: A Puzzle Solved (Partially)

Cooperation, seemingly paradoxical in the context of natural selection focused on individual survival, is a topic that Bergstrom and Dugatkin have addressed extensively. They've dissected the mechanisms that drive cooperation, exploring concepts like reciprocal altruism, where cooperation is maintained through repeated interactions and the threat of punishment for defection. They highlight the importance of social structures and communication in facilitating cooperative behaviors, demonstrating how the seemingly self-interested nature of natural selection can lead to the evolution of surprisingly altruistic traits. Their work reveals the nuances of cooperation, showing it's not simply a matter of selflessness but a complex strategic interaction shaped by environmental pressures and social dynamics.

4. The Importance of Mathematical Modeling in Evolutionary Research

Bergstrom and Dugatkin both champion the use of mathematical models in evolutionary biology. They argue that these models are not mere abstractions but rather essential tools for testing hypotheses, generating predictions, and clarifying complex biological processes. Their work exemplifies the power of mathematical formalization to reveal underlying patterns and relationships that might be missed through purely observational approaches. Their insightful use of game theory and other mathematical techniques highlights the importance of a quantitative approach in understanding the mechanisms of evolution.

Conclusion

Bergstrom and Dugatkin's combined contributions to evolutionary biology are significant. By employing rigorous mathematical modeling, clearly explaining complex concepts, and applying their theoretical frameworks to real-world examples, they have enhanced our understanding of the processes that shape life on Earth. Their work underscores the importance of interdisciplinary

approaches, merging theoretical biology with mathematical modeling and experimental observations. Their legacy lies not just in specific discoveries, but in their advocacy for a more quantitative and integrated approach to understanding the fascinating intricacies of evolution.

FAQs

1. What is the primary focus of Bergstrom and Dugatkin's research? Their research focuses on applying mathematical models, particularly game theory, to understand diverse evolutionary phenomena, including cooperation, arms races, and the evolution of social behavior.
2. How does game theory help explain evolution? Game theory provides a framework for analyzing strategic interactions between organisms, helping us understand how cooperation, competition, and altruism can evolve.
3. What are some key examples of Bergstrom and Dugatkin's work? While they don't have a single joint book, their individual and collaborative work spans numerous publications exploring the applications of game theory to evolutionary biology, inclusive fitness, and the evolution of cooperation.
4. Are their works primarily theoretical, or do they incorporate empirical data? Their work is largely theoretical, focusing on building and analyzing mathematical models. However, they often ground their theories in real-world examples and empirical observations.
5. How does their work contribute to our understanding of biodiversity? By elucidating the mechanisms driving adaptation and co-evolution, their work provides crucial insights into the dynamic processes that generate and maintain biodiversity.

bergstrom and dugatkin evolution: Evolution Carl T. Bergstrom, Lee Alan Dugatkin, 2016-02-25 *Evolution* presents foundational concepts through a contemporary framework of population genetics and phylogenetics that is enriched by current research and stunning art. In every chapter, new critical thinking questions and expanded end-of-chapter problems emphasizing data interpretation reinforce the Second Edition's focus on helping students think like evolutionary biologists.

bergstrom and dugatkin evolution: Evolution Carl T. Bergstrom, Lee Alan Dugatkin, 2012 *Evolution* integrates phylogenetic thinking and in-depth, current research examples throughout, providing a contemporary view of evolutionary biology. A stunning art program and an emphasis on problem solving engage students and help them understand fundamental concepts and processes--Back cover.

bergstrom and dugatkin evolution: Calling Bullshit Carl T. Bergstrom, Jevin D. West, 2021-04-20 *Bullshit* isn't what it used to be. Now, two science professors give us the tools to dismantle misinformation and think clearly in a world of fake news and bad data. "A modern classic . . . a straight-talking survival guide to the mean streets of a dying democracy and a global pandemic."—Wired Misinformation, disinformation, and fake news abound and it's increasingly difficult to know what's true. Our media environment has become hyperpartisan. Science is conducted by press release. Startup culture elevates bullshit to high art. We are fairly well equipped to spot the sort of old-school bullshit that is based in fancy rhetoric and weasel words, but most of us

don't feel qualified to challenge the avalanche of new-school bullshit presented in the language of math, science, or statistics. In *Calling Bullshit*, Professors Carl Bergstrom and Jevin West give us a set of powerful tools to cut through the most intimidating data. You don't need a lot of technical expertise to call out problems with data. Are the numbers or results too good or too dramatic to be true? Is the claim comparing like with like? Is it confirming your personal bias? Drawing on a deep well of expertise in statistics and computational biology, Bergstrom and West exuberantly unpack examples of selection bias and muddled data visualization, distinguish between correlation and causation, and examine the susceptibility of science to modern bullshit. We have always needed people who call bullshit when necessary, whether within a circle of friends, a community of scholars, or the citizenry of a nation. Now that bullshit has evolved, we need to relearn the art of skepticism.

bergstrom and dugatkin evolution: *Extinction and Evolution* Niles Eldredge, 2014

Eldredge's groundbreaking work is now accepted as the definitive statement of how life as we know it evolved on Earth. This book chronicles how Eldredge made his discoveries and traces the history of life through the lenses of paleontology, geology, ecology, anthropology, biology, genetics, zoology, mammalogy, herpetology, entomology and botany. While rigorously accurate, the text is accessible, engaging and free of jargon.

bergstrom and dugatkin evolution: *A Cooperative Species* Samuel Bowles, Herbert Gintis, 2011-05-31 A fascinating look at the evolutionary origins of cooperation Why do humans, uniquely among animals, cooperate in large numbers to advance projects for the common good? Contrary to the conventional wisdom in biology and economics, this generous and civic-minded behavior is widespread and cannot be explained simply by far-sighted self-interest or a desire to help close genealogical kin. In *A Cooperative Species*, Samuel Bowles and Herbert Gintis—pioneers in the new experimental and evolutionary science of human behavior—show that the central issue is not why selfish people act generously, but instead how genetic and cultural evolution has produced a species in which substantial numbers make sacrifices to uphold ethical norms and to help even total strangers. The authors describe how, for thousands of generations, cooperation with fellow group members has been essential to survival. Groups that created institutions to protect the civic-minded from exploitation by the selfish flourished and prevailed in conflicts with less cooperative groups. Key to this process was the evolution of social emotions such as shame and guilt, and our capacity to internalize social norms so that acting ethically became a personal goal rather than simply a prudent way to avoid punishment. Using experimental, archaeological, genetic, and ethnographic data to calibrate models of the coevolution of genes and culture as well as prehistoric warfare and other forms of group competition, *A Cooperative Species* provides a compelling and novel account of how humans came to be moral and cooperative.

bergstrom and dugatkin evolution: *Mathematical Models of Social Evolution* Richard McElreath, Robert Boyd, 2008-09-15 Over the last several decades, mathematical models have become central to the study of social evolution, both in biology and the social sciences. But students in these disciplines often seriously lack the tools to understand them. A primer on behavioral modeling that includes both mathematics and evolutionary theory, *Mathematical Models of Social Evolution* aims to make the student and professional researcher in biology and the social sciences fully conversant in the language of the field. Teaching biological concepts from which models can be developed, Richard McElreath and Robert Boyd introduce readers to many of the typical mathematical tools that are used to analyze evolutionary models and end each chapter with a set of problems that draw upon these techniques. *Mathematical Models of Social Evolution* equips behaviorists and evolutionary biologists with the mathematical knowledge to truly understand the models on which their research depends. Ultimately, McElreath and Boyd's goal is to impart the fundamental concepts that underlie modern biological understandings of the evolution of behavior so that readers will be able to more fully appreciate journal articles and scientific literature, and start building models of their own.

bergstrom and dugatkin evolution: *Evolution* Carl T. Bergstrom, Lee Alan Dugatkin, 2018-12 Bergstrom and Dugatkin's highly regarded text now offers an expanded InQuizitive course.

InQuizitive provides adaptive learning activities for students. Its unique coaching pedagogy helps them learn important concepts and develop critical thinking skills. In addition, the text focuses on getting students to think like evolutionary biologists, with critical thinking questions throughout every chapter and expanded end-of-chapter problems emphasizing data interpretation.

bergstrom and dugatkin evolution: Signals Brian Skyrms, 2010-04-08 Brian Skyrms offers a fascinating demonstration of how fundamental signals are to our world. He uses various scientific tools to investigate how meaning and communication develop. Signals operate in networks of senders and receivers at all levels of life, transmitting and processing information. That is how humans and animals think and interact.

bergstrom and dugatkin evolution: The Tangled Bank Carl Zimmer, 2019-01-30 Used widely in non-majors biology classes, *The Tangled Bank* is the first textbook about evolution intended for the general reader. Zimmer, an award-winning science writer, takes readers on a fascinating journey into the latest discoveries about evolution. In the Canadian Arctic, paleontologists unearth fossils documenting the move of our ancestors from sea to land. In the outback of Australia, a zoologist tracks some of the world's deadliest snakes to decipher the 100-million-year evolution of venom molecules. In Africa, geneticists are gathering DNA to probe the origin of our species. In clear, non-technical language, Zimmer explains the central concepts essential for understanding new advances in evolution, including natural selection, genetic drift, and sexual selection. He demonstrates how vital evolution is to all branches of modern biology—from the fight against deadly antibiotic-resistant bacteria to the analysis of the human genome.

bergstrom and dugatkin evolution: Problems and Solutions for Strachan and Read's Human Molecular Genetics 2 David James Matthes, Andrew Read, 2001

bergstrom and dugatkin evolution: *Game Theory and Animal Behavior* Lee Alan Dugatkin, Hudson Kern Reeve, 2000-03-23 Game theory has revolutionized the study of animal behavior. The fundamental principle of evolutionary game theory—that the strategy adopted by one individual depends on the strategies exhibited by others—has proven a powerful tool in uncovering the forces shaping otherwise mysterious behaviors. In this volume, the first since 1982 devoted to evolutionary game theory, leading researchers describe applications of the theory to diverse types of behavior, providing an overview of recent discoveries and a synthesis of current research. The volume begins with a clear introduction to game theory and its explanatory scope. This is followed by a series of chapters on the use of game theory to understand a range of behaviors: social foraging, cooperation, animal contests, communication, reproductive skew and nepotism within groups, sibling rivalry, alternative life-histories, habitat selection, trophic-level interactions, learning, and human social behavior. In addition, the volume includes a discussion of the relations among game theory, optimality, and quantitative genetics, and an assessment of the overall utility of game theory to the study of social behavior. Presented in a manner accessible to anyone interested in animal behavior but not necessarily trained in the mathematics of game theory, the book is intended for a wide audience of undergraduates, graduate students, and professional biologists pursuing the evolutionary analysis of animal behavior.

bergstrom and dugatkin evolution: Moral Sentiments and Material Interests Herbert Gintis, 2005 *Moral Sentiments and Material Interests* presents an innovative synthesis of research in different disciplines to argue that cooperation stems not from the stereotypical selfish agent acting out of disguised self-interest but from the presence of strong reciprocators in a social group. Presenting an overview of research in economics, anthropology, evolutionary and human biology, social psychology, and sociology, the book deals with both the theoretical foundations and the policy implications of this explanation for cooperation. Chapter authors in the remaining parts of the book discuss the behavioral ecology of cooperation in humans and nonhuman primates, modeling and testing strong reciprocity in economic scenarios, and reciprocity and social policy. The evidence for strong reciprocity in the book includes experiments using the famous Ultimatum Game (in which two players must agree on how to split a certain amount of money or they both get nothing.)

bergstrom and dugatkin evolution: Evolution Education Re-considered Ute Harms,

Michael J. Reiss, 2019-07-16 This collection presents research-based interventions using existing knowledge to produce new pedagogies to teach evolution to learners more successfully, whether in schools or elsewhere. 'Success' here is measured as cognitive gains, as acceptance of evolution or an increased desire to continue to learn about it. Aside from introductory and concluding chapters by the editors, each chapter consists of a research-based intervention intended to enable evolution to be taught successfully; all these interventions have been researched and evaluated by the chapters' authors and the findings are presented along with discussions of the implications. The result is an important compendium of studies from around the world conducted both inside and outside of school. The volume is unique and provides an essential reference point and platform for future work for the foreseeable future.

bergstrom and dugatkin evolution: *Evolution* Jean-Baptiste de Panafieu, 2007 THE book on how we came to be what we are. Unprecedented in its approach, the number and diversity of the species presented and the quality and diversity of its photographs, this is spectacular, elegant, mysterious, grotesque. Skeletons of the vertebrates that inhabit the earth today carry with them the imprint of an evolutionary process that has lasted several billion years. A dual approach, scientific and aesthetic, combines stunning photographs of whole or part skeletons with a short text that illuminates chosen themes of evolution.

bergstrom and dugatkin evolution: EVOLUTION 2E MED UPD EB+IQ REG CR (Second Edition, Media Update) Carl T. Bergstrom, Lee Alan Dugatkin, 2019-07-22

bergstrom and dugatkin evolution: Handbook of Evolutionary Psychology Charles Crawford, Dennis L. Krebs, 2013-03-07 Evolutionary psychology is concerned with the adaptive problems early humans faced in ancestral human environments, the nature of psychological mechanisms natural selection shaped to deal with those ancient problems, and the ability of the resulting evolved psychological mechanisms to deal with the problems people face in the modern world. Evolutionary psychology is currently advancing our understanding of altruism, moral behavior, family violence, sexual aggression, warfare, aesthetics, the nature of language, and gender differences in mate choice and perception. It is helping us understand the relationship between cognitive science, developmental psychology, behavior genetics, personality, and social psychology. Foundations of Evolutionary Psychology provides an up-to-date review of the ideas, issues, and applications of contemporary evolutionary psychology. It is suitable for senior undergraduates, first-year graduate students, or professionals who wish to become conversant with the major issues currently shaping the emergence of this dynamic new field. It will be interesting to psychologists, cognitive scientists, and anyone using new developments in the theory of evolution to gain new insights into human behavior.

bergstrom and dugatkin evolution: Evolution Donald R. Prothero, 2017-08-22 Donald R. Prothero's *Evolution* is an entertaining and rigorous history of the transitional forms and series found in the fossil record. Its engaging narrative of scientific discovery and well-grounded analysis has led to the book's widespread adoption in courses that teach the nature and value of fossil evidence for evolution. *Evolution* tackles systematics and cladistics, rock dating, neo-Darwinism, and macroevolution. It includes extensive coverage of the primordial soup, invertebrate transitions, the development of the backbone, the reign of the dinosaurs, and the transformation from early hominid to modern human. The book also details the many alleged "missing links" in the fossil record, including some of the most recent discoveries that flesh out the fossil timeline and the evolutionary process. In this second edition, Prothero describes new transitional fossils from various periods, vividly depicting such bizarre creatures as the *Odontochelys*, or the "turtle on the half shell"; fossil snakes with legs; and the "Frogamander," a new example of amphibian transition. Prothero's discussion of intelligent design arguments includes more historical examples and careful examination of the "experiments" and observations that are exploited by creationists seeking to undermine sound science education. With new perspectives, Prothero reframes creationism as a case study in denialism and pseudoscience rather than a field with its own intellectual dynamism. The first edition was hailed as an exemplary exploration of the fossil evidence for evolution, and this

second edition will be welcome in the libraries of scholars, teachers, and general readers who stand up for sound science in this post-truth era.

bergstrom and dugatkin evolution: The SAGE Handbook of Evolutionary Psychology

Todd K. Shackelford, 2021-08-04 Evolutionary psychology is an important and rapidly expanding area in the life, social, and behavioral sciences, and this Handbook represents the most comprehensive and up-to-date reference text in the field today. Over three volumes, the Handbook provides a rich overview of the most important theoretical and empirical work in the field. Chapters cover a broad range of topics, including theoretical foundations, the integration of evolutionary psychology with other life, social, and behavioral sciences, as well as with the arts and the humanities, and the increasing power of evolutionary psychology to inform applied fields, including medicine, psychiatry, law, and education. Each of the volumes has been carefully curated to have a strong thematic focus, covering: - The foundations of evolutionary psychology; - The integration of evolutionary psychology with other disciplines, and; - The applications of evolutionary psychology. The SAGE Handbook of Evolutionary Psychology is an essential resource for researchers, graduate students, and advanced undergraduate students in all areas of psychology, and in related disciplines across the life, social, and behavioral sciences.

bergstrom and dugatkin evolution: How to Tame a Fox (and Build a Dog) Lee Alan Dugatkin,

Lyudmila Trut, 2019-04-14 Tucked away in Siberia, there are furry, four-legged creatures with wagging tails and floppy ears that are as docile and friendly as any lapdog. But, despite appearances, these are not dogs—they are foxes. They are the result of the most astonishing experiment in breeding ever undertaken—imagine speeding up thousands of years of evolution into a few decades. In 1959, biologists Dmitri Belyaev and Lyudmila Trut set out to do just that, by starting with a few dozen silver foxes from fox farms in the USSR and attempting to recreate the evolution of wolves into dogs in real time in order to witness the process of domestication. This is the extraordinary, untold story of this remarkable undertaking. Most accounts of the natural evolution of wolves place it over a span of about 15,000 years, but within a decade, Belyaev and Trut's fox breeding experiments had resulted in puppy-like foxes with floppy ears, piebald spots, and curly tails. Along with these physical changes came genetic and behavioral changes, as well. The foxes were bred using selection criteria for tameness, and with each generation, they became increasingly interested in human companionship. Trut has been there the whole time, and has been the lead scientist on this work since Belyaev's death in 1985, and with Lee Dugatkin, biologist and science writer, she tells the story of the adventure, science, politics, and love behind it all. In *How to Tame a Fox*, Dugatkin and Trut take us inside this path-breaking experiment in the midst of the brutal winters of Siberia to reveal how scientific history is made and continues to be made today. To date, fifty-six generations of foxes have been domesticated, and we continue to learn significant lessons from them about the genetic and behavioral evolution of domesticated animals. *How to Tame a Fox* offers an incredible tale of scientists at work, while also celebrating the deep attachments that have brought humans and animals together throughout time.

bergstrom and dugatkin evolution: Remarkable Creatures Sean B. Carroll, 2014-10-16

National Book Award Finalist: A biologist's "thoroughly enjoyable" account of the expeditions that unearthed the history of life on our planet (Publishers Weekly). Not so long ago, most of our world was an unexplored wilderness. Our sense of its age was vague and vastly off the mark, and much of the knowledge of our own species' history was a set of fantastic myths and fairy tales. But scientists were about to embark on an amazing new era of understanding. From the New York Times bestselling author of *The Big Picture*, this book leads us on a rousing voyage that recounts the most important discoveries in two centuries of natural history: from Darwin's trip around the world to Charles Walcott's discovery of pre-Cambrian life in the Grand Canyon; from Louis and Mary Leakey's investigation of our deepest past in East Africa to the trailblazers in modern laboratories who have located a time clock in our DNA. Filled with the same sense of adventure that spurred on these extraordinary men and women, *Remarkable Creatures* is a "stirring introduction to the wonder of evolutionary biology" (Kirkus Reviews). "Charming and enlightening." —San Francisco Chronicle

"As fast-paced as a detective story." —Nature

bergstrom and dugatkin evolution: Evolution Douglas Futuyma, 2013-07-15 Thoroughly updated with new content, figures and citations, the third edition addresses major themes in contemporary evolutionary biology - including the history of evolution, evolutionary processes, adaptation, and evolution as an explanatory framework - at levels of biological organization ranging from genomes to ecological communities.

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bergstrom and dugatkin evolution: Evolution (Second Edition, Media Update) Carl T. Bergstrom, Lee Alan Dugatkin, 2018

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from evolutionary biology and rationalistic economics meet--emphasizing the links between static and dynamic approaches and noncooperative game theory. Much of the text is devoted to the key concepts of evolutionary stability and replicator dynamics. The former highlights the role of mutations and the latter the mechanisms of selection. Moreover, set-valued static and dynamic stability concepts, as well as processes of social evolution, are discussed. Separate background chapters are devoted to noncooperative game theory and the theory of ordinary differential equations. There are examples throughout as well as individual chapter summaries. Because evolutionary game theory is a fast-moving field that is itself branching out and rapidly evolving, Jörgen Weibull has judiciously focused on clarifying and explaining core elements of the theory in an up-to-date, comprehensive, and self-contained treatment. The result is a text for second-year graduate students in economic theory, other social sciences, and evolutionary biology. The book goes beyond filling the gap between texts by Maynard-Smith and Hofbauer and Sigmund that are currently being used in the field. Evolutionary Game Theory will also serve as an introduction for those embarking on research in this area as well as a reference for those already familiar with the field. Weibull provides an overview of the developments that have taken place in this branch of game theory, discusses the mathematical tools needed to understand the area, describes both the motivation and intuition for the concepts involved, and explains why and how it is relevant to economics.

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evidence that evolution happens at all. How do we know that species change? Has there really been enough time for evolution to operate? With *The Evidence for Evolution*, Alan R. Rogers provides an elegant, straightforward text that details the evidence for evolution. Rogers covers different levels of evolution, from within-species changes, which are much less challenging to see and believe, to much larger ones, say, from fish to amphibian, or from land mammal to whale. For each case, he supplies numerous lines of evidence to illustrate the changes, including fossils, DNA, and radioactive isotopes. His comprehensive treatment stresses recent advances in knowledge but also recounts the give and take between skeptical scientists who first asked "how can we be sure" and then marshaled scientific evidence to attain certainty. *The Evidence for Evolution* is a valuable addition to the literature on evolution and will be essential to introductory courses in the life sciences.

bergstrom and dugatkin evolution: Encyclopedia of Evolutionary Psychological Science Todd K. Shackelford, Viviana A. Weekes-Shackelford, 2021-03-20 This comprehensive, twelve volume reference work reflects the interdisciplinary influences on evolutionary psychology and serves as a major resource for its history, scientific contributors and theories. It draws on biology, cognitive science, anthropology, psychology, economics, computer science and paleoarchaeology to provide a multifaceted picture of behavioral adaptation in humans and how it adds to our academic and clinical understanding. Edited by a noted figure in evolutionary psychology, with many seminal and renowned contributors, this encyclopedia offers the full breadth of an area that is the forefront of behavioral thinking and investigation.

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modeling. Suitable for readers studying and working at the interface of mathematics and the life sciences, this book shows how evolutionary game theory is used in the modeling of these diverse biological phenomena.

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