Basic Paleontology Introduction To Paleobiology And The Fossil Record

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Bringing Fossils To Life: An Introduction To Paleobiology - Donald R. Prothero 2004
This is the first text to combine both paleontology and paleobiology. Traditional textbooks treat these separately, despite the recent trend to combine them in teaching. It bridges the gap between purely theoretical paleobiology and purely descriptive invertebrate paleontology books. The text is targeted at undergraduate geology and biology majors, with the emphasis on organisms, rather than dead objects to be described and catalogued. Current ideas from modern biology, ecology, population genetics, and many other concepts will be applied to the study of the fossil record.
The Sauropods - Kristina Curry Rogers 2005-12-16
"This is the most comprehensive overview and analysis of sauropod dinosaurs ever written."—Jason Head, Department of Paleobiology, Smithsonian Institution
Amniote Paleobiology - Matthew T. Carrano 2006-08
Living amniotes—including all mammals, birds, crocodilians, snakes, and turtles—comprise an extraordinarily varied array of more than 21,000 species. Found in every major habitat on earth, they possess a truly remarkable range of morphological, ecological, and behavioral adaptations. The fossil record of amniotes extends back three hundred million years and reveals much about modern biological diversity of form and function. A collaborative effort of twenty-four researchers, Amniote Paleobiology presents thirteen new and important scientific perspectives on the evolution and biology of this familiar group. It includes new discoveries of dinosaurs and primitive relatives of mammals; studies of mammalian chewing and locomotion; and examinations of the evolutionary process in plesiosaurs, mammals, and dinosaurs. Emphasizing the rich variety of analytical techniques available to vertebrate paleontologists—from traditional description to multivariate morphometrics and complex three-dimensional kinematics—Amniote Paleobiology seeks to understand how species are related to each other and what these relationships reveal about changes in anatomy and function over time. A timely synthesis of modern contributions to the field of evolutionary studies, Amniote Paleobiology furthers our understanding of this diverse group.
Principles of Paleontology - David Raup 1978-03-15
Explains in a clear and concise manner the factors involved in the description and classification of fossils and the practical applications of paleontologic data
The Evolution of Artiodactyls - Donald R. Prothero 2007-12-17
Artiodactyls are diverse and successful hoofed mammals, represented by nearly two hundred living species of pigs, peccaries, hippos, camels, deer, sheep, cattle, giraffes, and other even-toed ungulates. In the recent years, a tremendous amount of research has been conducted on this important order. The Evolution of Artiodactyls synthesizes this research into a single volume. The authors explore a variety of topics, including molecular phylogeny of terrestrial artiodactyls phylogenetic relationships of cetaceans to terrestrial artiodactyls, and the earliest artiodactyls—Diacodexidae, Dichobunidae, Homacodontidae, Leptochoeridae, and Raoellidae.
The Second Jurassic Dinosaur Rush - Paul D. Brinkman 2010-07-15
The so-called “Bone Wars” of the 1880s, which pitted Edward Drinker Cope against Othniel Charles Marsh in a frenzy of fossil collection and discovery, may have marked the introduction of dinosaurs to the American public, but the second Jurassic dinosaur rush, which took place around the turn of the twentieth century, brought the prehistoric beasts back to life. These later expeditions—which involved new competitors hailing from leading natural history museums in New York, Chicago, and Pittsburgh—yielded specimens that would be reconstructed into the colossal skeletons that thrill visitors today in museum halls across the country. Reconsidering the fossil speculation, the museum displays, and the media frenzy that ushered dinosaurs into the American public consciousness, Paul Brinkman takes us back to the birth of dinomania, the modern obsession with all things Jurassic. Featuring engaging and colorful personalities and motivations both altruistic and ignoble, The Second Jurassic Dinosaur Rush shows that these later expeditions were just as foundational—if not more so—to the establishment of paleontology and the budding collections of museums than the more famous Cope and Marsh treks. With adventure, intrigue, and rivalry, this is science at its most swashbuckling.
Paleontology - Derek Turner 2011-04-28
In the wake of the paleobiological revolution of the 1970s and 1980s, paleontologists continue to investigate far-reaching questions about how evolution works. Many of those questions have a philosophical dimension. How is macroevolution related to evolutionary changes within populations? Is evolutionary history contingent? How much can we know about the causes of evolutionary trends? How do paleontologists read the patterns in the fossil record to learn about the underlying evolutionary processes? Derek Turner explores these and other questions, introducing the reader to exciting recent work in the philosophy of paleontology and to theoretical issues including punctuated equilibria and species selection. He also critically examines some of the major accomplishments and arguments of paleontologists of the last 40 years.
The Star-Crossed Stone - Kenneth J. McNamara 2010-11-15
Throughout the four hundred thousand years that humanity has been collecting fossils, sea urchin fossils, or echinoids, have continually been among the most prized, from the Paleolithic era, when they decorated flint axes, to today, when paleobiologists study them for clues to the earth’s history. In The Star-Crossed Stone, Kenneth J. McNamara, an expert on fossil echinoids, takes readers on an incredible fossil hunt, with stops in history, paleontology, folklore, mythology, art, religion, and much more. Beginning with prehistoric times, when urchin fossils were used as jewelry, McNamara reveals how the fossil crept into the religious and cultural lives of societies around the world—the roots of the familiar five-pointed star, for example, can be traced to the pattern found on urchins. But McNamara’s vision is even broader than that: using our knowledge of early habits of fossil collecting, he explores the evolution of the human mind itself, drawing striking conclusions about humanity’s earliest appreciation of beauty and the first stirrings of artistic expression. Along the way, the fossil becomes a nexus through which we meet brilliant eccentrics and visionary archaeologists and develop new insights into topics as seemingly disparate as hieroglyphics, Beowulf, and even church organs. An idiosyncratic celebration of science, nature, and human ingenuity, The Star-Crossed Stone is as charming and unforgettable as the fossil at its heart.
Rereading the Fossil Record - David Sepkoski 2015-03-05
Rereading the Fossil Record presents the first-ever historical account of the origin, rise, and importance of paleobiology, from the mid-nineteenth century to the late 1980s. Drawing on a wealth of archival material, David Sepkoski shows how the movement was conceived and promoted by a small but influential group of paleontologists and examines the intellectual, disciplinary, and political dynamics involved in the ascendency of paleobiology. By tracing the role of computer technology, large databases, and quantitative analytical methods in the emergence of paleobiology, this book also offers insight into the growing prominence and centrality of data-driven approaches in recent science.
Paleontological Data Analysis - Øyvind Hammer 2008-04-15
During the last 10 years numerical methods have begun to dominate paleontology. These methods now reach far beyond the fields of

morphological and phylogenetic analyses to embrace biostratigraphy, paleobiogeography, and paleoecology. Paleontological Data Analysis explains the key numerical techniques in paleontology, and the methodologies employed in the software packages now available. Following an introduction to numerical methodologies in paleontology, and to univariate and multivariate techniques (including inferential testing), there follow chapters on morphometrics, phylogenetic analysis, paleobiogeography and paleoecology, time series analysis, and quantitative biostratigraphy Each chapter describes a range of techniques in detail, with worked examples, illustrations, and appropriate case histories Describes the purpose, type of data required, functionality, and implementation of each technique, together with notes of caution where appropriate The book and the accompanying PAST software package (see www.blackwellpublishing.com/hammer) are important investigative tools in a rapidly developing field characterized by many exciting new discoveries and innovative techniques An invaluable tool for all students and researchers involved in quantitative paleontology

A Manual of Practical Laboratory and Field Techniques in Palaeobiology - O.R. Green 2013-03-09

The user This manual is designed for the use of geo-scientists with an interest and need in developing palaeobiological materials as a potential source of data. To meet this objective practical procedures have been formatted for use by both professional and semi professional students with an initial understanding of palaeo biological research aims as a primary source of scientific data. I have attempted to provide an explanation and understanding of practical procedures which may be required by students undertaking palaeobiological projects as part of a degree course. The layout of this manual should be particularly beneficial in the instruction and training of geotechnologists and museum preparators. Graduate students and scientists requiring an outline of a preparation procedure will also be able to use the manual as a reference from which to assess the suitability of a procedure. This manual is also intended for use by the "committed amateur". Many of the techniques described in this manual have been devised by non-palaeontologists, and developed from methods used in archaeology, zoology and botany, as well as other areas of geology. A considerable number of the methods can be undertaken by the amateur, and in the case of many of the field procedures, should be used. This will ensure that specimens and samples can be conserved in such a manner as to facilitate any later research, and not invalidate the results of subsequent geochemical analytical techniques which might be employed.

The Paleobiological Revolution - David Sepkoski 2015-03-04

The Paleobiological Revolution chronicles the incredible ascendance of the once-maligned science of paleontology to the vanguard of a field. With the establishment of the modern synthesis in the 1940s and the pioneering work of George Gaylord Simpson, Ernst Mayr, and Theodosius Dobzhansky, as well as the subsequent efforts of Stephen Jay Gould, David Raup, and James Valentine, paleontology became embedded in biology and emerged as paleobiology, a first-rate discipline central to evolutionary studies. Pairing contributions from some of the leading actors of the transformation with overviews from historians and philosophers of science, the essays here capture the excitement of the seismic changes in the discipline. In so doing, David Sepkoski and Michael Ruse harness the energy of the past to call for further study of the conceptual development of modern paleobiology.

Evolution of Vertebrate Design - Leonard B. Radinsky 2015-02-26

The Evolution of Vertebrate Design is a solid introduction to vertebrate evolution, paleontology, vertebrate biology, and functional, comparative anatomy. Its lucid style also makes it ideal for general readers intrigued by fossil history. Clearly drawn diagrams illustrate biomechanical explanations of the evolution of fins, jaws, joints, and body shapes among vertebrates. A glossary of terms is included. "A luminous text is matched by lucid drawings rationally placed. . . . A great teaching monograph, the book will charm lay readers of fossil history. For virtually every college & public collection."—Scitech Book News

Conservation Paleobiology - Gregory P. Dietl 2017-11-17

In conservation, perhaps no better example exists of the past informing the present than the return of the California condor to the Vermilion Cliffs of Arizona. Extinct in the region for nearly one hundred years, condors were successfully reintroduced starting in the 1990s in an effort informed by the fossil record—condor skeletal remains had been found in the area’s late-Pleistocene cave deposits. The potential benefits of applying such data to conservation initiatives are unquestionably great, yet integrating the relevant disciplines has proven challenging. Conservation Paleobiology gathers a remarkable array of scientists—from Jeremy B. C. Jackson to Geerat J. Vermeij—to provide an authoritative overview of how paleobiology can inform both the management of threatened species and larger conservation decisions. Studying endangered species is difficult. They are by definition rare, some exist only in captivity, and for those still in their native habitats any experimentation can potentially have a negative effect on survival. Moreover, a lack of long-term data makes it challenging to anticipate biotic responses to environmental conditions that are outside of our immediate experience. But in the fossil and prefossil records—from natural accumulations such as reefs, shell beds, and caves to human-made deposits like kitchen middens and archaeological sites—enlightening parallels to the Anthropocene can be found that might serve as a primer for present-day predicaments. Offering both deep-time and near-time perspectives and exploring a range of ecological and evolutionary dynamics and taxa from terrestrial as well as aquatic habitats, Conservation Paleobiology is a sterling demonstration of how the past can be used to manage for the future, giving new hope for the creation and implementation of successful conservation programs.

The Paleobiology of Australopithecus - Kaye E. Reed 2013-03-15

Australopithecus species have been the topic of much debate in palaeoanthropology since Raymond Dart described the first species, Australopithecus africanus, in 1925. This volume synthesizes the geological and paleontological context of the species in East and South Africa; covers individual sites, such as Dikika, Hadar, Sterkfontein, and Malapa; debates the alpha taxonomy of some of the species; and addresses questions regarding the movements of the species across the continent. Additional chapters discuss the genus in terms of sexual dimorphism, diet reconstruction using microwear and isotopic methodologies, postural and locomotor behavior, and ontogeny.

Cowen's History of Life - Michael J. Benton 2019-08-08

A newly revised and fully updated edition of the market-leading introduction to paleontology Designed for students and anyone else with an interest in the history of life on our planet, the new edition of this classic text describes the biological evolution of Earth’s organisms, and reconstructs their adaptations and the ecology and environments in which they functioned. Cowen's History of Life, 6th Edition includes major updates, including substantial rewrites to chapters on the origins of eukaryotes, the Cambrian explosion, the terrestrialization of plants and animals, the Triassic recovery of life, the origin of birds, the end-Cretaceous mass extinction, and human evolution. It also features new chapters on plants, soils and transformation of the land; the Mesozoic marine revolution; and the evolution of oceans and climates. Beginning with the origin of the Earth and the earliest life on earth, the book goes on to offer insightful contributions covering: the evolution of Metazoans; the early vertebrates; life of vertebrates on land; and early amniotes and thermoregulation. The book also looks at: dinosaur diversity, as well as their demise; early mammals; the rise of modern mammals; the Neogene Savannas; primates; life in the ice ages; and more. Covers the breadth of the subject in a concise yet specific way for undergrads with no academic background in the topic Reorganizes all chapters to reflect the geological series of events, enabling a new focus on big events Updated with three brand new chapters and numerous revised ones Put together by a new editorial team internationally recognized as the global leaders in paleontology Filled with illustrations and photographs throughout Includes diagrams to show internal structures of organisms, cladograms, time scales and events, and paleogeographic maps Supplemented with a dedicated website that explores additional enriching information and discussion, and which features images for use in visual presentations Cowen's History of Life, 6th Edition is an ideal book for undergraduate students taking courses in introductory paleontology, as well those on global change and earth systems.

Stratigraphic Paleobiology - Mark E. Patzkowsky 2012-04-16

This work weaves important strands of the paleontological literature into a coherent worldview that emphasizes the importance of understanding the geological record.

Dinosaur Paleobiology - Stephen L. Brusatte 2012-04-30

The study of dinosaurs has been experiencing a remarkable renaissance over the past few decades. Scientific understanding of dinosaur anatomy, biology, and evolution has advanced to such a degree that paleontologists often know more about 100-million-year-old dinosaurs than many species of living organisms. This book provides a contemporary review of dinosaur science intended for students, researchers, and dinosaur enthusiasts. It reviews the latest knowledge on dinosaur anatomy and phylogeny, how dinosaurs functioned as living

animals, and the grand narrative of dinosaur evolution across the Mesozoic. A particular focus is on the fossil evidence and explicit methods that allow paleontologists to study dinosaurs in rigorous detail. Scientific knowledge of dinosaur biology and evolution is shifting fast, and this book aims to summarize current understanding of dinosaur science in a technical, but accessible, style, supplemented with vivid photographs and illustrations. The Topics in Paleobiology Series is published in collaboration with the Palaeontological Association, and is edited by Professor Mike Benton, University of Bristol. Books in the series provide a summary of the current state of knowledge, a trusted route into the primary literature, and will act as pointers for future directions for research. As well as volumes on individual groups, the series will also deal with topics that have a cross-cutting relevance, such as the evolution of significant ecosystems, particular key times and events in the history of life, climate change, and the application of a new techniques such as molecular palaeontology. The books are written by leading international experts and will be pitched at a level suitable for advanced undergraduates, postgraduates, and researchers in both the paleontological and biological sciences. Additional resources for this book can be found at:
http://www.wiley.com/go/brusatte/dinosaurpaleobiology.

Bringing Fossils to Life - Donald R. Prothero 2013-11-05

One of the leading textbooks in its field, Bringing Fossils to Life applies paleobiological principles to the fossil record while detailing the evolutionary history of major plant and animal phyla. It incorporates current research from biology, ecology, and population genetics, bridging the gap between purely theoretical paleobiological textbooks and those that describe only invertebrate paleobiology and that emphasize cataloguing live organisms instead of dead objects. For this third edition Donald R. Prothero has revised the art and research throughout, expanding the coverage of invertebrates and adding a discussion of new methodologies and a chapter on the origin and early evolution of life.

The Practical Paleontologist - Steve Parker 1991

Overview of paleontology and how these specialists do their jobs.

Basic Palaeontology - Michael J. Benton 1997

Palaeontology, a fundamental topic in geology and evolutionary biology, has undergone exciting and rapid change in recent years. Contemporary debates on mass extinctions and the origin of life have had profound implications for our understanding of how life evolved. Basic Palaeontology is a comprehensive and accessible introduction to palaeontology. With in-depth analysis of basic principles and all the main fossil groups, this fully illustrated text presents new and exciting research on the origin and history of life. The text focuses on traditional topics such as marine invertebrate palaeontology and biostratigraphy, but also provides unique and unparalleled taxonomic coverage from microfossils to plants and vertebrates. Key Features include: - Covers important recent developments in macroevolution and mass extinctions - A strong focus on a statistical and quantitative approach, emphasising the vital importance of both applications and theory - Full coverage of the evolution of vertebrates and plants - Over 600 highly detailed illustrations - An accessible format with extensive boxed material and bullet points Basic Palaeontology is essential reading for undergraduate students of geology, environmental science and biology, taking courses in palaeontology, palaeobiology, palaeoecology or evolution, and will also be of interest to all those who have an interest in the origin of life and human evolution. Michael J Benton is a Reader in the Department of Geology, University of Bristol, UK. David A T Harper is a Lecturer in Geology at the Department of Geology, University College Galway, Ireland.

Explorers of Deep Time - Roy Plotnick 2022-01-04

Paleontology is one of the most visible yet most misunderstood fields of science. Children dream of becoming paleontologists when they grow up. Museum visitors flock to exhibits on dinosaurs and other prehistoric animals. The media reports on fossil discoveries and new clues to mass extinctions. Nonetheless, misconceptions abound: paleontologists are assumed only to be interested in dinosaurs, and they are all too often imagined as bearded white men in battered cowboy hats. Roy Plotnick provides a behind-the-scenes look at paleontology as it exists today in all its complexity. He explores the field’s aims, methods, and possibilities, with an emphasis on the compelling personal stories of the scientists who have made it a career. Paleontologists study the entire history of life on Earth; they do not only use hammers and chisels to unearth fossils but are just as likely to work with cutting-edge computing technology. Plotnick presents the big questions about life’s history that drive paleontological research and shows why knowledge of Earth’s past is essential to understanding present-day environmental crises. He introduces readers to the diverse group of people of all genders, races, and international backgrounds who make up the twenty-first-century paleontology community, foregrounding their perspectives and firsthand narratives. He also frankly discusses the many challenges that face the profession, with key takeaways for aspiring scientists. Candid and comprehensive, Explorers of Deep Time is essential reading for anyone curious about the everyday work of real-life paleontologists.

Nautilus - W. Bruce Saunders 2009-12-17

1. 1 Nautilus and Allonautilus: Two Decades of Progress W. Bruce Saunders Department of Geology Bryn Mawr College Bryn Mawr PA 19010 wsaunder@brynmawr. edu Neil H. Landman Division of Paleontology American Museum of Natural History New York, New York 10024 landman@amnh. org When Nautilus: Biology and Paleobiology of a Living Fossil was published in 1987, it marked a milestone in cross-disciplinary collaboration. More than half of the contributing authors (36/65) were paleontologists, many of whom were collaborating with neontological counterparts. Their interest in studying this reclusive, poorly known animal was being driven by a search for clues to the mode of life and natural history of the once dominant shelled cephalopods, through study of the sole surviving genus. At the same time, Nautilus offered an opportunity for neontologists to look at a fundamentally different, phylogenetically basal member of the extant Cephalopoda. It was a w- win situation, combining paleontological deep-time perspectives, old fashioned expeditionary zeal, traditional biological approaches and new techniques. The results were cross-fertilized investigations in such disparate fields as ecology, functional morphology, taphonomy, genetics, phylogeny, locomotive dynamics, etc. As one reviewer of the xxxvi Introduction xxxvii book noted, Nautilus had gone from being one of the least known to one of the best understood of living cephalopods.

Atlas of Taphonomic Identifications - Yolanda Fernandez-Jalvo 2016-07-28

The aim of the atlas is to provide images of taphonomic modifications, making it as comprehensive as possible with evidence presently available. This volume is intended both as a field guide for identifying taphonomic modifications in the field, and for use in the laboratory when collections of fossils are being analyzed. Images in the book are a combination of scanning electron micrographs, regular photographs, cross-sections of bones and line drawings and graphs. By providing good quality illustrations of taphonomic modifications, with links between similar types of modification, the atlas provides a reference source for identifying the agents responsible for the modifications, the processes by which they were formed, and the potential bias introduced by the processes. The authors also aim to emphasize on the directions they consider taphonomic studies should be headed. Firstly, we should seek to quantify the degree of bias introduced into a fossil fauna and to take account of this bias before interpreting the palaeoecology of the fossil site. Secondly, we should recognize that taphonomic modifications increase the information encoded in fossils by identifying perimortem and postmortem contexts. This provides a more dynamic and realistic view of the past.

Understanding Fossils - Peter Doyle 2014-08-15

The first introductory palaeontology text which demonstrates the importance of selected fossil groups in geological and biological studies, particularly in understanding evolutionary patterns, palaeoenvironmental analysis, and stratigraphy. Part one explores several key concepts, such as the processes of fossil preservation, the determination of evolutionary patterns, and use of fossils and statigraphical tools. Part two introduces the main fossil groups of value in these applied fields. Part three concentrates on the examination of important case histories which demonstrate the use of fossils in diverse practical examples. Evolutionary studies, palaeoenvironmental analysis, and stratigraphical applications are documented using up-to-date examples supported by overviews of the principles.

Paleoecology - David J. Bottjer 2016-02-09

Paleoecology is a discipline that uses evidence from fossils to provide an understanding of ancient environments and the ecological history of life through geological time. This text covers the fundamental approaches that have provided the foundation for present paleoecological understanding, and outlines new research areas in paleoecology for managing future environmental and ecological change. Topics include the use of actualism in paleoecology, development of paleoecological models for paleoenvironmental reconstruction, taphonomy and

exceptional fossil preservation, evolutionary paleoecology and ecological change through time, and conservation paleoecology. Data from studies of invertebrates, vertebrates, plants and microfossils, with added emphasis on bioturbation and microbial sedimentary structures, are discussed. Examples from marine and terrestrial environments are covered, with a particular focus on periods of great ecological change, such as the Precambrian-Cambrian transition and intervals of mass extinction. Readership: This book is designed for advanced undergraduates and beginning graduate students in the earth and biological sciences, as well as researchers and applied scientists in a range of related disciplines.

Urumaco and Venezuelan Paleontology - Marcelo R. SÃ¡nchez-Villagra 2010-07-16

Urumaco and Venezuelan Paleontology offers a synthesis of the paleontological record of Venezuela, including new discoveries on stratigraphy, paleobotany, fossil invertebrates, and vertebrates. Besides providing a critical summary of the record of decapods, fishes, crocodiles, turtles, rodents, armadillos, and ungulates, several chapters introduce new information on the distribution and paleobiology of groups not previously studied in this part of the world. Given its position in the northern neotropics, close to the Panamanian land bridge, Venezuela is a key location for understanding faunal exchanges between the Americas in the recent geological past. The book reviews the recent paleobotanical and vertebrate fossil record of the region, provides an understanding of Pleistocene climatic change and biogeography for the last few thousand years, and integrates new information with summaries of Spanish language works on Venezuelan geology and paleontology.

Fossils in the Making - Anna K. Behrensmeyer 1988-02-15

Oregon residents W. C. McRae and Judy Jewell give their unique perspective on coastal Oregon — from the best places to grab a seaside snack to hiking the Coastal Trail. Packed with information on dining, transportation, and accommodations,Moon Coastal Oregonhas options for a range of travel budgets and offers endless options for inn-hopping or surfing along the southern beaches.

Invertebrate Palaeontology and Evolution - E. N. K. Clarkson 2013-07-23

Invertebrate Palaeontology and Evolution is well establishedas the foremost palaeontology text at the undergraduate level. Thisfully revised fourth edition includes a complete update of thesections on evolution and the fossil record, and the evolution ofthe early metazoans. New work on the classification of the major phyla (inparticular brachiopods and molluscs) has been incorporated. The section on trace fossils is extensively rewritten. The author has taken care to involve specialists in the majorgroups, to ensure the taxonomy is as up-to-date and accurate aspossible.

Introduction to Paleobiology and the Fossil Record - Michael J. Benton 2013-04-25

This book presents a comprehensive overview of the science of the history of life. Paleobiologists bring many analytical tools to bear in interpreting the fossil record and the book introduces the latest techniques, from multivariate investigations of biogeography and biostratigraphy to engineering analysis of dinosaur skulls, and from homeobox genes to cladistics. All the well-known fossil groups are included, including microfossils and invertebrates, but an important feature is the thorough coverage of plants, vertebrates and trace fossils together with discussion of the origins of both life and the metazoans. All key related subjects are introduced, such as systematics, ecology, evolution and development, stratigraphy and their roles in understanding where life came from and how it evolved and diversified. Unique features of the book are the numerous case studies from current research that lead students to the primary literature, analytical and mathematical explanations and tools, together with associated problem sets and practical schedules for instructors and students. “..any serious student of geology who does not pick this book off the shelf will be putting themselves at a huge disadvantage. The material may be complex, but the text is extremely accessible and well organized, and the book ought to be essential reading for palaeontologists at undergraduate, postgraduate and more advanced levels—both in Britain as well as in North America.” Falcon-Lang, H., Proc. Geol. Assoc. 2010 “...this is an excellent introduction to palaeontology in general. It is well structured, accessibly written and pleasantly informative .....I would recommend this as a standard reference text to all my students without hesitation.” David Norman Geol Mag 2010 Companion website This book includes a companion website at: www.blackwellpublishing.com/paleobiology The website includes: · An ongoing database of additional Practical’s prepared by the authors · Figures from the text for downloading · Useful links for each chapter · Updates from the authors

Neogene Paleontology of the Manonga Valley, Tanzania - Terry Harrison 1997-05-31

Contributions to this volume detail paleontologic research in Manonga Valley, and shed important light on the evolutionary development of eastern Africa. Chapters provide novel insights into the taxonomy, paleobiology, ecology, and zoogeographic relationships of African faunas, as well as lay the foundation for future geological, paleontological, and paleoecological studies in this important area. The book concludes with a discussion of the importance of investigations on broader geographical sites, including the Manonga Valley, for human evolution research. The text is supported by 143 illustrations.

Dinosaurs - David E. Fastovsky 2021-07-01

The ideal textbook for non-science majors, this lively and engaging introduction encourages students to ask questions, assess data critically and think like a scientist. Building on the success of previous editions, Dinosaurs has been thoroughly updated to include new discoveries in the field, such as the toothed bird specimens found in China and recent discoveries of dinosaur soft anatomy. Illustrations by leading paleontological illustrator John Sibbick and new, carefully-chosen photographs, clearly show how dinosaurs looked, lived and their role in Earth history. Making science accessible and relevant through clear explanations and extensive illustrations, the text guides students through the dinosaur groups, emphasizing scientific concepts rather than presenting endless facts. Grounded in the common language of modern evolutionary biology – phylogenetic systematics – students learn to think about dinosaurs the way that professional paleontologists do.

Fossil Horses - Bruce J. MacFadden 1994-06-24

The horse has frequently been used as a classic example of long-term evolution because it possesses an extensive fossil record. This book synthesizes the large body of data and research relevant to an understanding of fossil horses from perspectives such as biology, geology, paleontology.

Paleontology in Ecology and Conservation - Julien Louys 2012-04-25

The fossil record contains unique long-term insights into how ecosystems form and function which cannot be determined simply by examining modern systems. It also provides a record of endangered species through time, which allow us to make conservation decisions based on thousands to millions of years of information. The aim of this book is to demonstrate how palaeontological data has been or could be incorporated into ecological or conservation scientific studies. This book will be written by palaeontologists for modern ecologists and conservation scientists. Manuscripts will fall into one (or a combination) of four broad categories: case studies, review articles, practical considerations and future directions. This book will serve as both a ‘how to guide’ and provide the current state of knowledge for this type of research. It will highlight the unique and critical insights that can be gained by the inclusion of palaeontological data into modern ecological or conservation studies.

Palaeobiology of Giant Flightless Birds - Delphine Angst 2017-11-16

The fossil record of giant flightless birds extends back to the Late Cretaceous, more than 70 million years ago, but our understanding of these extinct birds is still incomplete. This is partly because the number of specimens available is sometimes limited, but also because widely different approaches have been used to study them, with sometimes contradictory results. This book summarizes the current knowledge of the paleobiology of seven groups of giant flightless birds: Dinornithiformes, Aepyornithiformes, Dromornithidae, Phorusrhacidae, Brontornithidae, Gastornithidae and Gargantuavis. The first chapter presents the global diversity of these birds and reviews the tools and methods used to study their paleobiology. Chapters 2 to 8 are each dedicated to one of the seven groups of extinct birds. Finally, a conclusion offers a global synthesis of the information presented in the book in an attempt to define a common evolutionary model. Focuses on the giant flightless birds that evolved independently in different parts of the world since the Cretaceous period Covers a number of different families with different evolutionary histories, providing a source of interesting comparisons Provides emphasis on the palaeobiology of these birds, including their evolution, adaptations, mode of life, ecology and extinction

Species and Speciation in the Fossil Record - Warren D. Allmon 2016-10-05

The literature of paleobiology is brimming with qualifiers and cautions about using species in the fossil record, or equating such species with those recognized among living organisms. Species and Speciation in the Fossil Record digs through this literature and surveys the recent

research on species in paleobiology. In these pages, experts in the field examine what they think species are - in their particular taxon of specialty or more generally in the fossil record. They also reflect on what the answers mean for thinking about species in macroevolution. The first step in this approach is an overview of the Modern Synthesis, and paleobiology's development of quantitative ways of documenting and analyzing variation with fossil assemblages. Following that, this volume's central chapters explore the challenges of recognizing and defining species from fossil specimens, and show how with careful interpretation and a clear species concept, fossil species may be sufficiently robust for meaningful paleobiological analyses. Tempo and mode of speciation over time are also explored, exhibiting how the concept of species, if more refined, can reveal enormous amounts about the interplay between species origins and extinction and local and global climate change.

Cetacean Paleobiology - Felix G. Marx 2016-03-29

Cetaceans (whales, dolphins, and porpoises) have fascinated and bewildered humans throughout history. Their mammalian affinities have been long recognized, but exactly which group of terrestrial mammals they descend from has, until recently, remained in the dark. Recent decades have produced a flurry of new fossil cetaceans, extending their fossil history to over 50 million years ago. Along with new insights from genetics and developmental studies, these discoveries have helped to clarify the place of cetaceans among mammals, and enriched our understanding of their unique adaptations for feeding, locomotion and sensory systems. Their continuously improving fossil record and successive transformation into highly specialized marine mammals have made cetaceans a textbook case of evolution - as iconic in its own way as the origin of birds from dinosaurs. This book aims to summarize our current understanding of cetacean evolution for the serious student and interested amateur using photographs, drawings, charts and illustrations.

Dinosaurs Rediscovered - Michael J Benton 2020-06-02

In this fascinating and accessible overview, renowned paleontologist Michael J. Benton reveals how our understanding of dinosaurs is being transformed by recent fossil finds and new technology. Over the past twenty years, the study of dinosaurs has transformed into a true scientific discipline. New technologies have revealed secrets locked in prehistoric bones that no one could have previously predicted. We can now work out the color of dinosaurs, the force of their bite, their top speeds, and even how they cared for their young. Remarkable new fossil discoveries—giant sauropod dinosaur skeletons in Patagonia, dinosaurs with feathers in China, and a tiny dinosaur tail in Burmese amber—remain the lifeblood of modern paleobiology. Thanks to advances in technologies and methods, however, there has been a recent revolution in the scope of new information gleaned from such fossil finds. In Dinosaurs Rediscovered, leading paleontologist Michael J. Benton gathers together all the latest paleontological evidence, tracing the transformation of dinosaur study from its roots in antiquated natural history to an indisputably scientific field. Among other things, the book explores how dinosaur remains are found and excavated, and especially how paleontologists read the details of dinosaurs' lives from their fossils—their colors, their growth, and even whether we will ever be able to bring them back to life. Benton's account shows that, though extinct, dinosaurs are still very much a part of our world.

Paleobiology of the Polycystine Radiolaria - David Lazarus 2020-12-09

Polycystine radiolaria are exclusively marine protists and are found in all ocean waters, from polar regions to the tropics, and at all water depths. There are approximately 600 distinct described living species and several thousand fossil species of polycystines. Radiolarians in general, and polycystines in particular, have recently been shown to be a major component of the living plankton and important to the oceanic carbon cycle. As fossils radiolarians are also fairly common, and often occur in sediments where other types of fossils are absent. This has made them very valuable for certain types of geologic research, particularly estimating the geologic age of the sediments containing them, and as guides to past oceanic water conditions. As our current understanding of the biology, and even taxonomy of the living fauna is still very incomplete, evolutionary studies based on living polycystines are still rare. However, the common occurrence of numerous specimens for many species, and in a wide variety of oceanic environments, provides an excellent opportunity to study the processes of biologic evolution in the fossil record. Paleobiology of the Polycystine Radiolaria is the first major book on radiolarians to appear in the western literature since 2001. Focusing on living and fossil siliceous shelled radiolarians, it is notable for its emphasis not upon morphologic or taxonomic detail but on concepts and applications. The book attempts to provide a balanced, critical review of what is known of the biology, ecology, and fossil record of the group, as well as their use in evolutionary, biostratigraphic and paleoceanographic research. Full chapters on the history of study, and molecular biology, are the first ever in book form. Written for an audience of advanced undergraduate to doctoral students, as well as for a broad range of professionals in the biological and Earth sciences, Paleobiology of the Polycystine Radiolaria summarizes current understanding of the marine planktonic protist group polycystine radiolaria, both in living and fossil form.

Cowen's History of Life - Michael J. Benton 2019-10-07

A newly revised and fully updated edition of the market-leading introduction to paleontology Designed for students and anyone else with an interest in the history of life on our planet, the new edition of this classic text describes the biological evolution of Earth's organisms, and reconstructs their adaptations and the ecology and environments in which they functioned. Cowen's History of Life, 6th Edition includes major updates, including substantial rewrites to chapters on the origins of eukaryotes, the Cambrian explosion, the terrestrialization of plants and animals, the Triassic recovery of life, the origin of birds, the end-Cretaceous mass extinction, and human evolution. It also features new chapters on plants, soils and transformation of the land; the Mesozoic marine revolution; and the evolution of oceans and climates. Beginning with the origin of the Earth and the earliest life on earth, the book goes on to offer insightful contributions covering: the evolution of Metazoans; the early vertebrates; life of vertebrates on land; and early amniotes and thermoregulation. The book also looks at: dinosaur diversity, as well as their demise; early mammals; the rise of modern mammals; the Neogene Savannas; primates; life in the ice ages; and more. Covers the breadth of the subject in a concise yet specific way for undergrads with no academic background in the topic Reorganizes all chapters to reflect the geological series of events, enabling a new focus on big events Updated with three brand new chapters and numerous revised ones Put together by a new editorial team internationally recognized as the global leaders in paleontology Filled with illustrations and photographs throughout Includes diagrams to show internal structures of organisms, cladograms, time scales and events, and paleogeographic maps Supplemented with a dedicated website that explores additional enriching information and discussion, and which features images for use in visual presentations Cowen's History of Life, 6th Edition is an ideal book for undergraduate students taking courses in introductory paleontology, as well those on global change and earth systems.