

Fossils And Ancient Life

Uncover the ancient past—your guide to fantastic fossils Set off on an amazing adventure into the prehistoric past when dinosaurs roamed the Earth. Fossils for Kids is filled with fascinating photographs and captivating facts that will teach junior fossil hunters ages 5 to 9 how fossils form, where they are found, and tips on how to identify them. Start by learning more about some of your favorite dinosaurs—from Velociraptor to Tyrannosaurus rex—and where you can see the coolest dinosaur skeletons. Then discover the creatures that predate even the dinosaurs! You'll meet famous birds, like the Archaeopteryx, explore tiny invertebrate trilobites, and learn which ancient plant is the source of a delicious drink—root beer! Fossils for Kids includes: Beyond dinos—You won't just be learning about dinosaurs; this book covers mammals, other reptiles, and plant fossils. Greater knowledge—Use the fun sidebars to dive deeper into the fossil world and get more hands-on learning. Clear images—The colorful pictures allow you to easily identify fossils. It's time to unearth your scientific curiosity—their are so many things that you'll find using Fossils for Kids as your guide.

Today many school students are shielded from one of the most important concepts in modern science: evolution. In an engaging and conversational style, Teaching About Evolution and the Nature of Science provides a well-structured framework for understanding and teaching evolution. Written for teachers, parents, and community officials as well as scientists and educators, this book describes how evolution reveals both the great diversity and similarity among the Earth's organisms; it explores how scientists approach the question of evolution; and it illustrates the nature of science as a way of knowing about the natural world. In addition, the book provides answers to frequently asked questions to help readers understand many of the issues and misconceptions about evolution. The book includes sample activities for teaching about evolution and the nature of science. For example, the book includes activities that investigate fossil footprints and population growth that teachers of science can use to introduce principles of evolution. Background information, materials, and step-by-step presentations are provided for each activity. In addition, this volume: Presents the evidence for evolution, including how evolution can be observed today. Explains the nature of science through a variety of examples. Describes how science differs from other human endeavors and why evolution is one of the best avenues for helping students understand this distinction. Answers frequently asked questions about evolution. Teaching About Evolution and the Nature of Science builds on the 1996 National Science Education Standards released by the National Research Council—and offers detailed guidance on how to evaluate and choose instructional materials that support the standards. Comprehensive and practical, this book brings one of today's educational challenges into focus in a balanced and reasoned discussion. It will be of special interest to teachers of science, school administrators, and interested members of the community.

"Today, as society faces global issues such as climate change, the rapid degradation of habitats and accelerated extinction of species, we turn for insight not to "futurists" but to paleontologists, who often can demonstrate with empirical data from the fossil record how Earth and its inhabitants have responded to great changes — some of them catastrophic — in the past. Paleontology is a rich field, imbued with a long and interesting past and an even more intriguing and hopeful future. Paleontology represents the desire of human beings to better understand the history of life on Earth, and in so doing to better understand themselves and the world around them, including fundamental principles governing changes. Many people think paleontology is the study of fossils. In fact, paleontology is much more. In short, paleontology is the study of what fossils tell us about the ecologies of the past, about evolution, and about our place, as humans, in the world. Paleontology incorporates knowledge from biology, geology, ecology, anthropology, archaeology, and even computer science to understand the processes that have led to the origination and eventual extinction of the different types of organisms since life arose. Paleontologists study prehistoric life, seeking to piece together the story of how species evolved and how ancient ecosystems developed in response to an ever-changing Earth. And researchers do so with only the tiniest drops of evidence: fossilized remains of ancient life, from which we can infer much about our world as it was millions of years ago, teaming with life. In documenting evolution, paleontologists often can link the changes they see in species over time with large-scale changes in the environment of the entire planet, or of specific regions. This book presents original research of interest to the international community in the fields of palaeontology, taxonomy and systematic. It deals with the recovery and identification of plant remains from geological contexts and their place in the reconstruction of past environments and the history of life. It covers the study of fossil and extant spores and pollen dealing with the recovery and identification of multicellular animal remains and the use of these fossils in the reconstruction of prehistoric environments and ancient ecosystems. It also focuses on how to use data from fossils and subfossils to reconstruct the ecosystems of the past."

Controversies, Theories and Myths about Southern Africa's Geological Past

The Pageant of Austin, Texas

Paleontology, the Study of Fossils

Being an Attempt to Explain the Former Changes of the Earth's Surface, by Reference to Causes Now in Operation

A Guide to Ancient Life

Fossils from European Geoparks

Numerical Approaches to the Evaluation of Fossils and Ancient Ecosystems

"[Bubbling] over with the joy of scientific discovery . . . Great fun for anyone looking to revive their childhood dinosaur obsessions." —Publishers Weekly, starred review
What if we woke up one morning all of the dinosaur bones in the world were gone? How would we know these iconic animals had a 165-million year history on earth, and had adapted to all land-based environments from pole to pole? What clues would be left to discern not only their presence, but also to learn about their sex lives, raising of young, social lives, combat, and who ate who? What would it take for us to know how fast dinosaurs moved, whether they lived underground, climbed trees, or went for a swim? Welcome to the world of ichnology, the study of traces and trace fossils—such as tracks, trails, burrows, nests, toothmarks, and other vestiges of behavior—and how through these remarkable clues, we can explore and intuit the rich and complicated lives of dinosaurs. With a unique, detective-like approach, interpreting the forensic clues of these long-extinct animals that leave a much richer legacy than bones, Martin brings the wild world of the Mesozoic to life for the twenty-first-century reader.

From Fossils to Astrobiology reviews developments in paleontology and geobiology that relate to the rapidly-developing field of Astrobiology, the study of life in the Universe. Many traditional areas of scientific study, including astronomy, chemistry and planetary science, contribute to Astrobiology, but the study of the record of life on planet Earth is critical in guiding investigations in the rest of the cosmos. In this varied book, expert scientists from 15 countries present peer-reviewed, stimulating reviews of paleontological and astrobiological studies. The reviews of established and emerging techniques for studying modern and ancient microorganisms on Earth and beyond, will be valuable guides to evaluating biosignatures which could be found in the extraterrestrial surface or subsurface within the Solar System and beyond. This volume also provides discussion on the controversial reports of "nanobacteria" in the Martian meteorite ALH84001. It is a unique volume among Astrobiology monographs in focusing on fossil evidence from the geological record and will be valuable to students and researchers alike. Riddles in Stone covers a variety of fascinating controversies and startling differences of opinion that accompanied the evolution of the study of earth sciences in southern Africa. Over the centuries, debates have raged amongst geologists, and between geologists and biologists, physicists and theologians, on controversies such as the age of the earth and its lifespan; the apocalypse; Noah's Flood as myth or fact; continental drift; the origin of ore deposits of gold, diamonds, copper and platinum; and Schwarz's well-meaning but forgotten Kalahari Scheme. This encyclopedic book is the result of a lifetime's work. Although scrupulously rooted in scientific literature, it maintains an accessible and entertaining tone and shows how consensus amongst a majority may be proof of nothing. Hugh Eales is professor emeritus of geology at Rhodes University (South Africa). He founded the School of Exploration Geology in 1978 and is a Life Fellow of the Geological Society of South Africa.

Fossilization

Paleontology

The Discovery of Earth's Earliest Fossils

A Sea without Fish

Why Dinosaurs Matter

A New Geological History of North America

Ancient Life in Kentucky

The Oxford Handbook of Animals in Classical Thought and Life is the first comprehensive guide to animals in the ancient world, encompassing all aspects of the topic by featuring authoritative chapters on 33 topics by leading scholars in their fields. As well as an introduction to, and a survey of, each topic, it provides guidance on further reading for those who wish to study a particular area in greater depth. Both the realities and the more theoretical aspects of the treatment of animals in ancient times are covered in chapters which explore the domestication of animals, animal husbandry, animals as pets, Aesop's Fables, and animals in classical art and comedy, all of which closely examine the nature of human-animal interaction. More abstract and philosophical topics are also addressed, including animal communication, early ideas on the origin of species, and philosophical vegetarianism and the notion of animal rights.

Life on Earth can be traced back over three thousand million years into the past. Many examples of the Earth's past inhabitants are to be found in rocks, preserved as beautiful and fascinating fossils. The earliest life forms were bacteria and algae; these produced the oxygen that enabled more complex life forms to develop. About 600 million years ago multi-cellular organisms appeared on Earth, some of which could protect themselves with hard parts such as shells. Many of these life forms were readily fossilized and are used to subdivide geological time. Numerous species have evolved and most are now extinct. Lineages can be traced and extinctions explained as a consequence of terrestrial and extra-terrestrial events. Lavishly illustrated with photographs and explanatory diagrams Introducing Palaeontology provides a concise and accessible introduction to the science of palaeontology. The book is divided into two parts. The first explains what a fossil is; how fossils came to be preserved; how they are classified; and what information they can tell scientists about the rocks in which they are found. The second part introduces the major fossil groups taking a systematic view from algae and plants, through the numerous examples of invertebrate animals, to the vertebrates and finally to man's ancestors. Technical terms are kept to a minimum and a glossary is provided.

A guide to the ancient Life of Vancouver Island.

A Guide to the Ancient Life of Vancouver Island

Life in the Ordovician Sea of the Cincinnati Region

The Oxford Handbook of Animals in Classical Thought and Life

Dinosaur Lives Revealed by Their Trace Fossils

Proceedings of a Workshop

Some Assembly Required

Tales of Intrepid Fossil Hunters and the Wonders of Evolution

A workshop to assess the science and technology of life detection techniques was organized by the Committee on the Origins and Evolution of Life (COEL) of the Board on Life Sciences (BLS) and the Space Studies Board (SSB). Topics discussed in the workshop included the search for extraterrestrial life in situ and in the laboratory, extant life and the signature of extinct life, and determination of the point of origin (terrestrial or not) of detected organisms.

One of the greatest mysteries in reconstructing the history of life on Earth has been the apparent absence of fossils dating back more than 550 million years. We have long known that fossils of sophisticated marine life-forms existed at the dawn of the Cambrian Period, but until recently scientists had found no traces of Precambrian fossils. The quest to find such traces began in earnest in the mid-1960s and culminated in one dramatic moment in 1993 when William Schopf identified fossilized microorganisms three and a half billion years old. This startling find opened up a vast period of time—some eighty-five percent of Earth's history—to new research and new ideas about life's beginnings. In this book, William Schopf, a pioneer of modern paleontology, tells for the first time the exciting and fascinating story of the origins and earliest evolution of life and how that story has been unearthed. Gracefully blending his personal story of discovery with the basics needed to understand the astonishing science he describes, Schopf has produced an introduction to paleobiology for the interested reader as well as a primer for beginning students in the field. He considers such questions as how did primitive bacteria, pond scum, evolve into the complex life-forms found at the beginning of the Cambrian Period? How do scientists identify ancient microbes and what do their tiny creatures tell us about the environment of the early Earth? (And, in a related chapter, Schopf discusses his role in the controversy that swirls around recent claims of fossils in the famed meteorite from Mars.) Like all great teachers, Schopf teaches the non-specialist enough about his subject along the way that we can easily follow his descriptions of the geology, biology, and chemistry behind these discoveries. Anyone interested in the intriguing questions of the origins of life on Earth and how those origins have been discovered will find this story the best place to start.

This volume provides a detailed description of a wide range of numerical, statistical or modeling techniques and novel instrumentation separated into individual chapters written by paleontologists with expertise in the given methodology. Each chapter outlines the strengths and limitations of specific numerical or technological approaches, and ultimately applies the chosen method to a real fossil dataset or sample type. A unifying theme throughout the book is the evaluation of fossils during the prologue and epilogue of one of the most exciting events in Earth History: the Cambrian radiation.

From Fossils to Astrobiology

Wonders of Ancient Life

Quantifying the Evolon of Early Life

Precambrian to Pleistocene

Fossils

Prehistoric Life

A Comprehensive Outline of the Principles and Leading Facts of Paleontological Science

What can long-dead dinosaurs teach us about our future? Plenty, according to paleontologist Kenneth Lacovara, who has discovered some of the largest creatures to ever walk the Earth. By tapping into the ubiquitous wonder that dinosaurs inspire, Lacovara weaves together the stories of our geological awakening, of humanity's epic struggle to understand the nature of deep time, the meaning of fossils, and our own place on the vast and beautiful tree of life. Go on a journey—back to when dinosaurs ruled the Earth—to discover how dinosaurs achieved feats unparalleled by any other group of animals. Learn the secrets of how paleontologists find fossils, and explore quirky, but profound questions, such as: Is a penguin a dinosaur? And, how are the tiny arms of T. rex the key to its power and ferocity? In this revealing book, Lacovara offers the latest ideas about the shocking and calamitous death of the dinosaurs and ties their vulnerabilities to our own. Why Dinosaurs Matter is compelling and engaging—a great reminder that our place on this planet is both precarious and potentially fleeting. “As we move into an uncertain environmental future, it has never been more important to understand the past.”

Looks at how fossils are formed, what we can learn about ancient life from them, and how fossils are found and dated.

A review of the ancient life of the Great Lakes Basin from the Precambrian through the Ice Age

SAT 2017 Strategies, Practice & Review with 3 Practice Tests

A Report Based on the April 2000 Workshop on Life Detection Techniques

Stratigraphical Palaeontology

Cradle of Life

In Search of Ancient Queensland

Fossils for Kids

The Story of Life in 25 Fossils

A much-needed exploration of Great Lakes geology

"Fact Finders is published by Capstone Press."

*Now that the College Board's new SAT is in effect, you can face the redesigned test with confidence using SAT 2017 Strategies, Practice & Review. This essential guide provides brand new practice tests, clear explanations of test changes, detailed concept review, and much more. SAT 2017 Strategies, Practice & Review is the ideal prep tool for students looking to ace the redesigned test! SAT 2017 Strategies, Practice & Review includes: * 3 realistic practice tests for the new SAT. 1 in the book, 2 online * In-depth review of the new Evidence-Based Reading and Writing section and the new Optional Essay * In-depth review of all Math topics tested in the new SAT, including analysis of data, charts, and graphs * Scoring, analysis, and explanations for 1 official SAT Practice Test * Explanations of the new SAT scoring systems, including Area Scores, Test Scores, Cross-Test Scores, and Subscores * Hundreds of practice questions with clear, detailed answers The SAT guide you want to prep with to score higher—we guarantee a higher score!*

Earth Sciences Series

Records of Life on Earth and the Search for Extraterrestrial Biosignatures

Clues to Ancient Life

How the Mountains Grew

Fossil Behavior Compendium

Quantifying the Evolution of Early Life

Signs of Life

McCoy, Martina Menneken, Jes Rust, P. Martin Sander, Frank Tomasehek, Torsten Wappler, Kayleigh Wiersma, Tzu-Ruei Yang

A "superbly written, richly illustrated" guide to the animals who lived 450 million years ago—in the fossil-rich area where Cincinnati, Ohio now stands (Rocks & Minerals). The region around Cincinnati, Ohio, is known throughout the world for the abundant and beautiful fossils found in limestones and shales that were deposited as sediments on the sea floor during the Ordovician Period, about 450 million years ago—some 250 million years before the dinosaurs lived. In Ordovician time, the shallow sea that covered much of what is now the North American continent teemed with marine life. The Cincinnati area has yielded some of the world's most abundant and best-preserved fossils of invertebrate animals such as trilobites, bryozoans, brachiopods, molluscs, echinoderms, and graptolites. So famous are the Ordovician fossils and rocks of the Cincinnati region that geologists use the term "Cincinnatian" for strata of the same age all over North America. This book synthesizes more than 150 years of research on this fossil treasure-trove, describing and illustrating the fossils, the life habits of the animals represented, their communities, and living relatives, as well as the nature of the rock strata in which they are found and the environmental conditions of the ancient sea. "A fascinating glimpse of a long-extinct ecosystem." —Choice

Life on Earth can be traced back over three billion years into the past. Many examples of the Earths former inhabitants are to be found in rocks, preserved as beautiful and fascinating fossils. The earliest life forms were bacteria and algae; these produced the oxygen that enabled more complex life forms to develop. About 600 million years ago multi-cellular organisms appeared on Earth, some of which could protect themselves with hard parts such as shells. Many of these life forms were readily fossilized and are used to subdivide geological time. Numerous species have evolved and most are now extinct. Lineages can be traced and extinctions explained as a consequence of terrestrial and extra-terrestrial events.Now in a revised, updated and expanded

Second Edition Introducing Palaeontology will continue to provide readers with a concise and accessible introduction to the science of palaeontology.

Educational Series

Introducing Palaeontology

Understanding the Material Nature of Ancient Plants and Animals

A Brief Presentation of the Paleontological Succession in Kentucky Coupled with a Systematic Outline of the Archaeology of the Commonwealth

Principles of Geology

Dinosaurs Without Bones

Online + Book

The incredible story of the creation of a continent—our continent— from the acclaimed author of The Last Volcano and Mask of the Sun. The immense scale of geologic time is difficult to comprehend. Our lives—and the entirety of human history—are mere nanoseconds on this timescale. Yet we hugely influenced by the land we live on. From shales and fossil fuels, from lake beds to soil composition, from elevation to fault lines, and what could be more relevant that the history of the ground beneath our feet? For most of modern history, geologists could say little more about why mountains grew than the obvious: there were forces acting inside the Earth that caused mountains to rise. But what were those forces? And why did they act in some places of the planet and not at others? When the theory of plate tectonics was proposed, our concept of how the Earth worked experienced a momentous shift. As the Andes continue to rise, the Atlantic Ocean steadily widens, and Honolulu creeps ever closer to Tokyo, this seemingly imperceptible creep of the Earth is revealed in the landscape all around us. But tectonics cannot—and do not—explain everything about the wonders of the North American landscape. What about the Black Hills? Or the walls of chalk that stand amongst the rolling hills of west Kansas? Or the fact that the states of Washington and Oregon are slowly rotating clockwise, and there a diamond mine in Arizona? All it points to the geologic secrets hidden inside the 2-billion-year-old-continental masses. A whopping ten times older than the rocky floors of the ocean, continents hold the clues to the long history of our planet. With a sprightly narrative that vividly brings this science to life, John Dvorak's How the Mountains Grew will fill readers with a newfound appreciation for the wonders of the land we live on.

Evora's fossil tells a story. Best-selling paleontology author Donald R. Prothero describes twenty-five famous, beautifully preserved fossils in a gripping scientific history of life on Earth. Recounting the adventures behind the discovery of these objects and fully interpreting their significance within the larger fossil record, Prothero creates a riveting history of life on our planet. The twenty-five fossils portrayed in this book catch animals in their evolutionary splendor as they transition from one kind of organism to another. We witness extinct plants and animals of microscopic and immense size and thrilling diversity. We learn about fantastic land and sea creatures that have no match in nature today. Along the way, we encounter such fascinating fossils as the earliest trilobite, Olenellus; the giant shark Carcharocles; the "fishibian" Tiktaalik; the "Frogamander" and the "Turtle on the Half-Shell"; enormous marine reptiles and the biggest dinosaurs known; the first bird, Archaeopteryx; the walking whale Ambulocetus; the gigantic hornless rhinoceros Paraceratherium, the largest land mammal that ever lived; and the Australopithecus nicknamed "Lucy," the oldest human skeleton. We meet the scientists and adventurers who pioneered paleontology and learn about the larger intellectual and social contexts in which their discoveries were made. Finally, we find out where to see these splendid fossils in the world's great museums. Ideal for all who love prehistoric landscapes and delight in the history of science, this book makes a treasured addition to any bookshelf, stoking curiosity in the evolution of life on Earth.

In this complete and thorough update of Arthur Boucot's seminal work, Evolutionary Paleobiology of Behavior and Coevolution, Boucot is joined by George Poinar, who provides additional expertise and knowledge on protozoans and bacteria as applied to disease. Together, they make the Fossil Behavior Compendium wider in scope, covering all relevant animal and plant groups and all epochs, and providing a detailed review of animal and plant fossil behavior in terrestrial and aquatic environments. Fossil behavior encompasses not only past evidence of the life history of an organism but also behavioral, predation, and symbiotic interactions, including parasitism. This book compares patterns of behavior and coevolution in the past with those of the present-day descendants. It also discusses how to evaluate the rates of evolution of behavior and coevolution at various taxonomic levels. The compendium emphasizes the interactions between fossils and compares these interactions with present-day counterparts. It also provides new discussions on topics related to fossils in amber. Keeping Boucot's trademark, easy-to-read style, the book includes new findings never published previously, reports not easily accessed, numerous examples, 40 tables, 285 illustrations—some published here for the first time—and a four-page color insert. The book provides a concise account of the evidence for varied disease types recognized to date in the fossil record.

4 Billion Years of Geologic History in the Great Lakes Region

A Junior Scientist's Guide to Dinosaur Bones, Ancient Animals, and Prehistoric Life on Earth

Ancient Life of the Great Lakes Basin

Evolution and the Fossil Record

West Coast Fossils

A History of Life in 100 Fossils

The Ancient Life-history of the Earth

How small can a free-living organism be? On the surface, this question is straightforward-in principle, the smallest cells can be identified and measured. But understanding what factors determine this lower limit, and addressing the host of other questions that follow on from this knowledge, require a fundamental understanding of the chemistry and ecology of cellular life. The recent report of evidence for life in a martian meteorite and the prospect of searching for biological signatures in intelligently chosen samples from Mars and elsewhere bring a new immediacy to such questions. How do we recognize the morphological or chemical remnants of life in rocks deposited 4 billion years ago on another planet? Are the empirical limits on cell size identified by observation on Earth applicable to life wherever it may occur, or is minimum size a function of the particular chemistry of an individual planetary surface? These questions formed the focus of a workshop on the size limits of very small organisms, organized by the Steering Group for the Workshop on Size Limits of Very Small Microorganisms and held on October 22 and 23, 1998. Eighteen invited panelists, representing fields ranging from cell biology and molecular genetics to paleontology and mineralogy, joined with an almost equal number of other participants in a wide-ranging exploration of minimum cell size and the challenge of interpreting micro- and nano-scale features of sedimentary rocks found on Earth or elsewhere in the solar system. This document contains the proceedings of that workshop. It includes position papers presented by the individual panelists, arranged by panel, along with a summary, for each of the four sessions, of extensive roundtable discussions that involved the panelists as well as other workshop participants.

A pageant dramatizing significant historical events in the history of Austin.

The author of the bestselling Your Inner Fish gives us a brilliant, up-to-date account of the great transformations in the history of life on Earth. Over billions of years, fish evolved to walk on land, reptiles transformed into birds that fly, and ape-like primates changed into humans who walk on two legs, talk and write. This is a story full of surprises. If you think that feathers arose to help animals fly, or lungs to help them walk on land, you'd be in good company. You'd also be entirely wrong. Neil Shubin delves deep into the mystery of life, the ongoing revolutions in our understanding of how we got here, and brings us closer to answering one of the great questions - was life on earth inevitable...or was it all an accident?

Decoding Four Billion Years of Life, from Ancient Fossils to DNA

Great Lakes Rocks

Discoveries in Ancient Life

Teaching About Evolution and the Nature of Science

Size Limits of Very Small Microorganisms

Riddles in Stone

A History of Life in 100 Fossils showcases 100 key fossils that together illustrate the evolution of life on earth. Iconic specimens have been selected from the renowned collections of the two premier natural history museums in the world, the Smithsonian Institution, Washington, and the Natural History Museum.

London. The fossils have been chosen not only for their importance in the history of life, but also because of the visual story they tell. This stunning book is perfect for all readers because its clear explanations and beautiful photographs illuminate the significance of these amazing pieces, including 500 million-

year-old Burgess Shale fossils that provide a window into early animal life in the sea, insects encapsulated by amber, the first fossil bird Archaeopteryx, and the remains of our own ancestors.

Prehistoric life is the archive of evolution preserved in the fossil record. This book focuses on the meaning and significance of that archive and is designed for introductory/college science students, including non-science majors, enrolled in survey courses emphasizing paleontology, geology and biology. From the origins

of animals to the evolution of rap music, fromancient mass extinctions to the current biodiversity crisis, andfrom the Snowball Earth to present day climate change this bookcovers it, with an eye towards showing how past life on Earth putsthe modern world into its proper context. The history of life andthe patterns

and processes of evolution are especially emphasized,as are the interconnections between our planet, its climate system,andits varied life forms. The book does not just describe thehistory of life, but uses actual examples from life's historyto illustrate important concepts and theories.