Chapter 19 History Of Life Biology

A (Very) Short History of Life on Earth **A New History of Life** *The History of Life: A Very Short Introduction* Origins of Life Life History of Life *A Brief History of Life on Earth* Patterns and Processes in the History of Life **Cowen's History of Life** *Major Events in the History of Life Great Moments in the History of Life* The Origins of Life *Evolutionary History* **Who Wrote the Book of Life?** Fossils *Wonderful Life: The Burgess Shale and the Nature of History* A History of Life in 100 Fossils *A History of the Life Sciences The History of Life on Earth* **The Tangled Tree Mechanisms of Life History Evolution** Plant Evolution **A Brief Illustrated History of Life on Earth New Perspectives on the History of Life Sciences and Agriculture Life on a Young Planet The Musical Human History of Life In Search of Cell History The Mansion of Happiness History and Life** *Prehistoric Life Origins of the Earth, Moon, and Life* Extra Life *Beginnings of Cellular Life* **Life's Engines** *The Immortal Life of Henrietta Lacks* **The Daily Show (The Book) Life and Evolution** *The Prime of Life Life's Edge*

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A History of the Life Sciences May 19 2021 A clear and concise survey of the major themes and theories embedded in the history of life science, this book covers the development and significance of scientific methodologies, the relationship between science and society, and the diverse ideologies and current paradigms affecting the evolution and progression of biological studies. The author discusses cell theory, embryology, physiology, microbiology, evolution, genetics, and molecular biology; the Human Genome Project; and genomics and proteomics. Covering the philosophies of ancient civilizations to modern advances in genomics and molecular biology, the book is a unique and comprehensive resource.

Wonderful Life: The Burgess Shale and the Nature of History Jul 21 2021 A study of the Burgess Shale, a sea bed 530 million years old, and attempts to tackle what the findings are and what it means

History of Life May 31 2022 History of Life is not just for students, but for everyone interested in the history of life on our planet. Paleontology, the study of ancient life, requires some knowledge of biology, ecology, chemistry, physics and mathematics. However, the average person can have access to it without deep scientific training. This book serves three audiences: it is an introduction to palaeontology; a general education course that introduces nonspecialists to science and scientific thought; and an introduction to the history of life for biologists who know a lot about the present and little about the past. The author's aim is ambitious: to take you to the edges of our knowledge in palaeontology; to show you how life has evolved on Earth,;and to explain how we have constructed the history of that evolution from the record of rocks and fossils. Web page tied to use of book boxes. Case studies. End chapter questions. End chapter references.

The Origins of Life Nov 24 2021 Providing a comprehensive account of the environment of the early Earth and descriptions of how the first self-replicating systems emerged from prebiotic chemistry and evolved into primitive cell-like entities, this book is an essential reference for those interested in the origin of life on Earth.

Prehistoric Life Apr 05 2020 Prehistoric Life is a concise, accessible textbook focusing on the history of life and evolution within a geological and climatic context. Offering critical information and avoiding unnecessary bulk, the book begins with an introduction to the notion of science, the scientific method, and the limits of science. In the first half of the text, students learn about rocks, fossils, the geologic timescale, the structure of earth, abiogenesis, evolution, and classification. The second half of the book is devoted to exploring the past 3.8 billion years of life, from the earliest single-celled organisms in the Precambrian Eon through the rich evolutionary histories of the Paleozoic, Mesozoic, and Cenozoic Eras, to today's modern organisms, including ourselves. Prehistoric Life is ideal for courses in introductory geology, biology, and paleontology courses and can also be used as a reference guide for fossil collectors and enthusiasts alike.

History of Life Aug 10 2020 This text is designed for students and anyone else with an interest in the history of life on our planet. The author describes the biological evolution of Earth’s organisms, and reconstructs their adaptations to the life they led, and the ecology and environment in which they functioned. On the grand scale, Earth is a constantly changing planet, continually presenting organisms with challenges. Changing geography, climate, atmosphere, oceanic and land environments set a stage in which organisms interact with their environments and one another, with evolutionary change an inevitable result. The organisms themselves in turn can change global environments: oxygen in our atmosphere is all produced by photosynthesis, for example. The interplay between a changing Earth and its evolving organisms is the underlying theme of the book. The book has a dedicated website which explores additional enriching information and discussion, and provides or points to the art for the book and many other images useful for teaching. See: www.wiley.com/go/cowen/historyoflife.

Evolutionary History Oct 24 2021 We tend to see history and evolution springing from separate roots, one grounded in the human world and the other in the natural world. Human beings have, however, become probably the most powerful species shaping evolution today, and human-caused evolution in other species has probably been the most important force shaping human history. This book introduces readers to evolutionary history, a new field that unites history and biology to create a fuller understanding of the past than either can produce on its own. Evolutionary history can stimulate surprising new hypotheses for any field of history and evolutionary biology. How many art historians would have guessed that sculpture encouraged the evolution of tuskless elephants? How many biologists would have predicted that human poverty would accelerate animal evolution? How many military historians would have suspected that plant evolution would convert a counter-insurgency strategy into a rebel subsidy? With examples from around the globe, this book will help readers see the broadest patterns of history and the details of their own life in a new light.

Origins of Life Aug 02 2022 Origins of Life: A Cosmic Perspective presents an overview of the concepts, methods, and theories of astrobiology and origins of life research while presenting a summary of the latest findings. The book provides insight into the environments and processes that gave birth to life on our planet, which naturally informs our assessment of the probability that has arisen (or will arise) elsewhere. In addition, the book encourages readers to go beyond basic concepts, to explore topics in greater depth, and to engage in lively discussions. The text is intended to be suitable for mid- and upper-level undergraduates and beginning graduate students and more generally as an introduction and overview for researchers and general readers seeking to follow current developments in this interdisciplinary field. Readers are assumed to have a basic grounding in the relevant sciences, but prior specialized knowledge is not required. Each chapter concludes with a list of questions and discussion topics as well as suggestions for further reading. Some questions can be answered with reference to material in the text, but others require further reading and some have no known answers. The intention is to encourage readers to go beyond basic concepts, to explore topics in greater depth, and, in a classroom setting, to engage in lively discussions with class members.

A New History of Life Oct 04 2022 The history of life on Earth is, in some form or another, known to us all--or so we think. A New History of Life offers a provocative new account, based on the latest scientific research, of how life on our planet evolved--the first major new synthesis for general readers in two decades. Charles Darwin's theories, first published more than 150 years ago, form the backbone of how we understand the history of the Earth. In reality, the currently accepted history of life on Earth is so flawed, so out of date, that it's past time we need a 'New History of Life.' In their latest book, Joe Kirschvink and Peter Ward will show that many of our most cherished beliefs about the evolution of life are wrong. Gathering and analyzing years of discoveries and research not yet widely known to the public, A New History of Life proposes a different origin of species than the one Darwin proposed, one which includes eight-foot-long centipedes, a frozen “snowball Earth”, and the seeds for life originating on Mars. Drawing on their years of experience in paleontology, biology, chemistry, and astrobiology, experts Ward and Kirschvink paint a picture of the origins life on Earth that are at once too fabulous to imagine and too familiar to dismiss--and looking forward, A New History of Life brilliantly assembles insights from some of the latest scientific research to understand how life on Earth can and might evolve far into the future.

A (Very) Short History of Life on Earth Nov 05 2022 "[A]n exuberant romp through evolution, like a modern-day Willy Wonka of genetic space. Gee’s grand tour enthusiastically details the narrative underlying life’s erratic and often whimsical exploration of biological form and function.” —Adrian Woolfson, The Washington Post In the tradition of Richard Dawkins, Bill Bryson, and Simon Winchester—An entertaining and uniquely informed narration of Life's life story. In the beginning, Earth was an inhospitably alien place—in constant chemical flux, covered with churning seas, crafting its landscape through incessant volcanic eruptions. Amid all this tumult and disaster, life began. The earliest living things were no more than membranes stretched across microscopic gaps in rocks, where boiling hot jets of mineral-rich water gushed out from cracks in the ocean floor. Although these membranes were leaky, the environment within them became different from the raging maelstrom beyond. These havens of order slowly refined the generation of energy, using it to form membrane-bound bubbles that were mostly-faithful copies of their parents—a foamy lather of soap-bubble cells standing as tiny clenched fists, defiant against the lifeless world. Life on this planet has continued in much the same way for millennia, adapting to literally every conceivable setback that living organisms could encounter and thriving, from these humblest beginnings to the thrilling and unlikely story of ourselves. In A (Very) Short History of Life on Earth, Henry Gee zips through the last 4.6 billion years with infectious enthusiasm and intellectual rigor. Drawing on the very latest scientific understanding and writing in a clear, accessible style, he tells an enlightening tale of survival and persistence that illuminates the delicate balance within which life has always existed.

A Brief History of Life on Earth Apr 29 2022 The story of life on earth unfolds in dramatic fashion in this amazing concertina picture book that takes readers from 4.6 billion years ago to the present day. It's difficult to grasp the enormous changes life on Earth has undergone since it first came into existence, but this marvelously illustrated book makes learning about our planet's fascinating history easy and entertaining. In an accordion style, the series of pages take readers through every major geological period, with bright artwork and detailed drawings. Opening on lava-filled oceans and smoking volcanoes, the book unfolds, era by era, to show how life evolved from tiny protozoa and crustaceans to dinosaurs and mammals. Fully expanded to 8 meters (26 feet), this spectacular visual timeline is a very impressive panorama that reveals evolution in all its glory. Each page is brimming with illustrations that readers will turn to again and again. A celebration of life, this extraordinary and beautiful book illuminates the history of Earth for young readers in an unforgettable and delightful way.

Life's Edge Jun 27 2019 FINALIST FOR THE PEN/E.O. WILSON LITERARY SCIENCE WRITING AWARD***A NEW YORK TIMES NOTABLE BOOK OF 2021***A SCIENCE NEWS FAVORITE BOOK OF 2021***A SMITHSONIAN TOP TEN SCIENCE BOOK OF 2021 “Stories that both dazzle and edify… This book is not just about life, but about discovery itself.” —Siddhartha Mukherjee, New York Times Book Review We all assume we know what life is, but the more scientists learn about the living world—from protocells to brains, from zygotes to pandemic viruses—the harder they find it is to locate life’s edge. Carl Zimmer investigates one of the biggest questions of all: What is life? The answer seems obvious until you try to seriously answer it. Is the apple sitting on your kitchen counter alive, or is only the apple tree it came from deserving of the word? If we can’t answer that question here on earth, how will we know when and if we discover alien life on other worlds? The question hangs over some of society’s most charged conflicts—whether a fertilized egg is a living person, for example, and when we ought to declare a person legally dead. Life's Edge is an utterly fascinating investigation that no one but one of the most celebrated science writers of our generation could craft. Zimmer journeys through the strange experiments that have attempted to re-create life. Literally hundreds of definitions of what that should look like now exist, but none has yet emerged as an obvious winner. Lists of what living things have in common do not add up to a theory of life. It's never clear why some items on the list are essential and others not. Coronaviruses have altered the course of history, and yet many scientists maintain they are not alive. Chemists are creating droplets that can swarm, sense their environment, and multiply. Have they made life in the lab? Whether he is handling pythons in Alabama or searching for hibernating bats in the Adirondacks, Zimmer revels in astounding examples of life at its most bizarre. He tries his own hand at evolving life in a test tube with unnerving results. Charting the obsession with Dr. Frankenstein's monster and how the world briefly believed radium was the source of all life, Zimmer leads us all the way into the labs and minds of researchers engineering life from scratch.

Extra Life Feb 02 2020 “Offers a useful reminder of the role of modern science in fundamentally transforming all of our lives.” —President Barack Obama (on Twitter) “An important book.” —Steven Pinker, The New York Times Book Review The surprising and important story of how humans gained what amounts to an extra life, from the bestselling author of How We Got to Now and Where Good Ideas Come From In 1920, at the end of the last major pandemic, global life expectancy was just over forty years. Today, in many parts of the world, human beings can expect to live more than eighty years. As a species we have doubled our life expectancy in just one century. There are few measures of human progress more astonishing than this increased longevity. Extra Life is Steven Johnson’s attempt to understand where that progress came from, telling the epic story of one of humanity’s greatest achievements. How many of those extra years came from vaccines, or the decrease in famines, or seatbelts? What are the forces that now keep us alive longer? Behind each breakthrough lies an inspiring story of cooperative innovation, of brilliant thinkers bolstered by strong systems of public support and collaborative networks, and of dedicated activists fighting for meaningful reform. But for all its focus on positive change, this book is also a reminder that meaningful gaps in life expectancy still exist, and that new threats loom on the horizon, as the COVID-19 pandemic has made clear. How do we avoid decreases in life expectancy as our public health systems face unprecedented challenges? What current technologies or interventions that could reduce the impact of future crises are we somehow ignoring? A study in how meaningful change happens in society, Extra Life celebrates the enduring power of common goals and public resources, and the heroes of public health and medicine too often ignored in popular accounts of our history. This is the sweeping story of a revolution with immense public and personal consequences: the doubling of the human life span.

The Musical Human Sep 10 2020 A RADIO 4 BOOK OF THE WEEK 'Full of delightful nuggets' Guardian online 'Entertaining, informative and philosphical ... An essential read' All About History 'Extraordinary range ... All the world and more is here' Evening Standard _____ 165 million years ago saw the birth of rhythm. 66 million years ago came the first melody. 40 thousand years ago Homo sapiens created the first musical instrument. Today music fills our lives. How we have created, performed and listened to this music throughout history has defined what our species is and how we understand who we are. Yet music is an overlooked part of our origin story. The Musical Human takes us on an exhilarating journey across the ages – from Bach to BTS and back – to explore the vibrant relationship between music and the human species. With insights from a wealth of disciplines, world-leading musicologist Michael Spitzer renders a global history of music on the widest possible canvas, looking at music in our everyday lives; music in world history; and music in evolution, from insects to apes, humans to AI. 'Michael Spitzer has pulled off the impossible: a Guns, Germs and Steel for music' Daniel Levitin 'A thrilling exploration of what music has meant and means to humankind' Ian Bostridge

The History of Life on Earth Apr 17 2021 Evolution is one of the most fundamental principles that governs life. Its actions may be subtle, but they can be observed every day, such as predators hunting prey, or plant successions in competing for empty space. These habituations were envisaged by Charles Darwin to be the properties of nature that lead to evolution and prompted the conceptualisation of the theory of natural selection. The force of this process can be most dramatically depicted by looking at the variation of organisms throughout the history of life on Earth.

Life's Engines Dec 02 2019 The marvelous microbes that made life on Earth possible and support our very existence For almost four billion years, microbes had the primordial oceans all to themselves. The stewards of Earth, these organisms transformed the chemistry of our planet to make it habitable for plants, animals, and us. Life's Engines takes readers deep into the microscopic world to explore how these marvelous creatures made life on Earth possible—and how human life today would cease to exist without them. Paul Falkowski looks "under the hood" of microbes to find the engines of life, the actual working parts that do the biochemical heavy lifting for every living organism on Earth. With insight and humor, he explains how these miniature engines are built—and how they have been appropriated by and assembled like Lego sets within every creature that walks, swims, or flies. Falkowski shows how evolution works to maintain this core machinery of life, and how we and other animals are veritable conglomerations of microbes. A vibrantly entertaining book about the microbes that support our very existence, Life's Engines will inspire wonder about these elegantly complex nanomachines that have driven life since its origin. It also issues a timely warning about the dangers of tinkering with that machinery to make it more "efficient" at meeting the ever-growing demands of humans in the coming century.

Mechanisms of Life History Evolution Feb 13 2021 Life history theory seeks to explain the evolution of the major features of life cycles by analyzing the ecological factors that shape age-specific schedules of growth, reproduction, and survival and by investigating the trade-offs that constrain the evolution of these traits. Although life history theory has made enormous progress in explaining the diversity of life history strategies among species, it traditionally ignores the underlying proximate mechanisms. This novel book argues that many fundamental problems in life history evolution, including the nature of trade-offs, can only be fully resolved if we begin to integrate information on developmental, physiological, and genetic mechanisms into the classical life history framework. Each chapter is written by an established or up-and-coming leader in their respective field; they not only represent the state of the art but also offer fresh perspectives for future research. The text is divided into 7 sections that cover basic concepts (Part 1), the mechanisms that affect different parts of the life cycle (growth, development, and maturation; reproduction; and aging and somatic maintenance) (Parts 2-4), life history plasticity (Part 5), life history integration and trade-offs (Part 6), and concludes with a synthesis chapter written by a prominent leader in the field and an editorial postscript (Part 7).

Great Moments in the History of Life Dec 26 2021 A non-technical (but serious) treatment of those parts of Earth history leading up to human history, as well as some pre-historical aspects of humanity. Many “events” in Earth’s history necessarily preceded the emergence of human beings (and intelligence). Geology has provided us with a great deal of information about these various steps on the way to intelligent life, and how and why they were important. Some of these events were on a cosmic scale (no universe – no life!), some were planetological/astronomical (no Earth – no life), some were essentially chemical (how did life emerge in the primordial ocean and why do we have oxygen in the atmosphere?), and some were details of evolutionary history (how did life colonize the land and how did mammals develop?). In this book an enthusiastic professor of geosciences presents a broad introduction from the Big Bang to the present and into the future, lucidly explaining aspects from various disciplines to interested, non-specialist readers.

Major Events in the History of Life Jan 27 2022 Major Events in the History of Life, present six chapters that summarize our understanding of crucial events that shaped the development of the earth's environment and the course of biological evolution over some four billion years of geological time. The subjects are covered by acknowledged leaders in their fields span an enormous sweep of biologic history, from the formation of planet Earth and the origin of living systems to our earliest records of human activity. Several chapters present new data and new syntheses, or summarized results of new types of analysis, material not usually available in current college textbooks.

Beginnings of Cellular Life Jan 03 2020 Develops a model of the origin of life in which cells originate first, proteins follow, and genes evolve last, which is supported by evidence mustered from biology, biochemistry, and biophysics. This work explores the origins of life and is for anyone who has ever thought seriously about the origin of life.

New Perspectives on the History of Life Sciences and Agriculture Nov 12 2020 This volume explores problems in the history of science at the intersection of life sciences and agriculture, from the mid-eighteenth to the mid-twentieth century. Taking a comparative national perspective, the book examines agricultural practices in a broad sense, including the practices and disciplines devoted to land management, forestry, soil science, and the improvement and management of crops and livestock. The life sciences considered include genetics, microbiology, ecology, entomology, forestry, and deal with US, European, Russian, Japanese, Indonesian, Chinese contexts. The book shows that the investigation of the border zone of life sciences and agriculture raises many interesting questions about how science develops. In particular it challenges one to re-examine and take seriously the intimate connection between scientific development and the practical goals of managing and improving – perhaps even recreating – the living world to serve human ends. Without close attention to this zone it is not possible to understand the emergence of new disciplines and transformation of old disciplines, to evaluate the role and impact of such major figures of science as Humboldt and Mendel, or to appreciate how much of the history of modern biology has been driven by national ambitions and imperialist expansion in competition with rival nations.

The Daily Show (The Book) Sep 30 2019 NEW YORK TIMES BESTSELLER The complete, uncensored history of the award-winning The Daily Show with Jon Stewart, as told by its correspondents, writers, and host. For almost seventeen years, The Daily Show with Jon Stewart brilliantly redefined the borders between television comedy, political satire, and opinionated news coverage. It launched the careers of some of today's most significant comedians, highlighted the hypocrisies of the powerful, and garnered 23 Emmys. Now the show's behind-the-scenes gags, controversies, and camaraderie will be chronicled by the players themselves, from legendary host Jon Stewart to the star cast members and writers-including Samantha Bee, Stephen Colbert, John Oliver, and Steve Carell - plus some of The Daily Show's most prominent guests and adversaries: John and Cindy McCain, Glenn Beck, Tucker Carlson, and many more. This oral history takes the reader behind the curtain for all the show's highlights, from its origins as Comedy Central's underdog late-night program to Trevor Noah's succession, rising from a scrappy jester in the 24-hour political news cycle to become part of the beating heart of politics-a trusted source for not only comedy but also commentary, with a reputation for calling bullshit and an ability to effect real change in the world. Through years of incisive election coverage, passionate debates with President Obama and Hillary Clinton, feuds with Bill O'Reilly and Fox, and provocative takes on Wall Street and racism, The Daily Show has been a cultural touchstone. Now, for the first time, the people behind the show's seminal moments come together to share their memories of the last-minute rewrites,

improvisations, pranks, romances, blow-ups, and moments of Zen both on and off the set of one of America's most groundbreaking shows.

The Immortal Life of Henrietta Lacks Oct 31 2019 #1 NEW YORK TIMES BESTSELLER • “The story of modern medicine and bioethics—and, indeed, race relations—is refracted beautifully, and movingly.”—Entertainment Weekly NOW A MAJOR MOTION PICTURE FROM HBO® STARRING OPRAH WINFREY AND ROSE BYRNE • ONE OF THE “MOST INFLUENTIAL” (CNN), “DEFINING” (LITHUB), AND “BEST” (THE PHILADELPHIA INQUIRER) BOOKS OF THE DECADE • ONE OF ESSENCE’S 50 MOST IMPACTFUL BLACK BOOKS OF THE PAST 50 YEARS • WINNER OF THE CHICAGO TRIBUNE HEARTLAND PRIZE FOR NONFICTION NAMED ONE OF THE BEST BOOKS OF THE YEAR BY The New York Times Book Review • Entertainment Weekly • O: The Oprah Magazine • NPR • Financial Times • New York • Independent (U.K.) • Times (U.K.) • Publishers Weekly • Library Journal • Kirkus Reviews • Booklist • Globe and Mail Her name was Henrietta Lacks, but scientists know her as HeLa. She was a poor Southern tobacco farmer who worked the same land as her slave ancestors, yet her cells—taken without her knowledge—became one of the most important tools in medicine: The first “immortal” human cells grown in culture, which are still alive today, though she has been dead for more than sixty years. HeLa cells were vital for developing the polio vaccine; uncovered secrets of cancer, viruses, and the atom bomb’s effects; helped lead to important advances like in vitro fertilization, cloning, and gene mapping; and have been bought and sold by the billions. Yet Henrietta Lacks remains virtually unknown, buried in an unmarked grave. Henrietta’s family did not learn of her “immortality” until more than twenty years after her death, when scientists investigating HeLa began using her husband and children in research without informed consent. And though the cells had launched a multimillion-dollar industry that sells human biological materials, her family never saw any of the profits. As Rebecca Skloot so brilliantly shows, the story of the Lacks family—past and present—is inextricably connected to the dark history of experimentation on African Americans, the birth of bioethics, and the legal battles over whether we control the stuff we are made of. Over the decade it took to uncover this story, Rebecca became enmeshed in the lives of the Lacks family—especially Henrietta’s daughter Deborah. Deborah was consumed with questions: Had scientists cloned her mother? Had they killed her to harvest her cells? And if her mother was so important to medicine, why couldn’t her children afford health insurance? Intimate in feeling, astonishing in scope, and impossible to put down, The Immortal Life of Henrietta Lacks captures the beauty and drama of scientific discovery, as well as its human consequences.

The History of Life: A Very Short Introduction Sep 03 2022 This Very Short Introduction presents a succinct and accessible guide to the key episodes in the story of life on earth - from the very origins of life four million years ago to the extraordinary diversity of species around the globe today.

In Search of Cell History Jul 09 2020 This comprehensive history of cell evolution “deftly discusses the definition of life” as well as cellular organization, classification and more (San Francisco Book Review). The origin of cells remains one of the most fundamental mysteries in biology, one that has spawned a large body of research and debate over the past two decades. With In Search of Cell History, Franklin M. Harold offers a comprehensive, impartial take on that research and the controversies that keep the field in turmoil. Written in accessible language and complemented by a glossary for easy reference, this book examines the relationship between cells and genes; the central role of bioenergetics in the origin of life; the status of the universal tree of life with its three stems and viral outliers; and the controversies surrounding the last universal common ancestor. Harold also discusses the evolution of cellular organization, the origin of complex cells, and the incorporation of symbiotic organelles. In Search of Cell History shows us just how far we have come in understanding cell evolution—and the evolution of life in general—and how far we still have to go. “Wonderful…A loving distillation of connections within the incredible diversity of life in the biosphere, framing one of biology’s most important remaining questions: how did life begin?”—Nature

The Tangled Tree Mar 17 2021 In this New York Times bestseller and longlist nominee for the National Book Award, “our greatest living chronicler of the natural world” (The New York Times), David Quammen explains how recent discoveries in molecular biology affect our understanding of evolution and life’s history. In the mid-1970s, scientists began using DNA sequences to reexamine the history of all life. Perhaps the most startling discovery to come out of this new field—the study of life’s diversity and relatedness at the molecular level—is horizontal gene transfer (HGT), or the movement of genes across species lines. It turns out that HGT has been widespread and important; we now know that roughly eight percent of the human genome arrived sideways by viral infection—a type of HGT. In The Tangled Tree, “the grandest tale in biology….David Quammen presents the science—and the scientists involved—with patience, candor, and flair” (Nature). We learn about the major players, such as Carl Woese, the most important little-known biologist of the twentieth century; Lynn Margulis, the notorious maverick whose wild ideas about “mosaic” creatures proved to be true; and Tsutomu Wantanabe, who discovered that the scourge of antibiotic-resistant bacteria is a direct result of horizontal gene transfer, bringing the deep study of genome histories to bear on a global crisis in public health. “David Quammen proves to be an immensely well-informed guide to a complex story” (The Wall Street Journal). In The Tangled Tree, he explains how molecular studies of evolution have brought startling recognitions about the tangled tree of life—including where we humans fit upon it. Thanks to new technologies, we now have the ability to alter even our genetic composition—through sideways insertions, as nature has long been doing. “The Tangled Tree is a source of wonder….Quammen has written a deep and daring intellectual adventure” (The Boston Globe).

History and Life May 07 2020

A History of Life in 100 Fossils Jun 19 2021 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 ahve 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.

Who Wrote the Book of Life? Sep 22 2021 This is a detailed history of one of the most important and dramatic episodes in modern science, recounted from the novel vantage point of the dawn of the information age and its impact on representations of nature, heredity, and society. Drawing on archives, published sources, and interviews, the author situates work on the genetic code (1953-70) within the history of life science, the rise of communication technosciences (cybernetics, information theory, and computers), the intersection of molecular biology with cryptanalysis and linguistics, and the social history of postwar Europe and the United States. Kay draws out the historical specificity in the process by which the central biological problem of DNA-based protein synthesis came to be metaphorically represented as an information code and a writing technology—and consequently as a “book of life.” This molecular writing and reading is part of the cultural production of the Nuclear Age, its power amplified by the centuries-old theistic resonance of the “book of life” metaphor. Yet, as the author points out, these are just metaphors: analogies, not ontologies. Necessary and productive as they have been, they have their epistemological limitations. Deploying analyses of language, cryptology, and information theory, the author persuasively argues that, technically speaking, the genetic code is not a code, DNA is not a language, and the genome is not an information system (objections voiced by experts as early as the 1950s). Thus her historical reconstruction and analyses also serve as a critique of the new genomic biopower. Genomic textuality has become a fact of life, a metaphor literalized, she claims, as human genome projects promise new levels of control over life through the meta-level of information: control of the word (the DNA sequences) and its editing and rewriting. But the author shows how the humbling limits of these scriptural metaphors also pose a challenge to the textual and material mastery of the genomic “book of life.”

A Brief Illustrated History of Life on Earth Dec 14 2020 A Brief Illustrated History of Life on Earth charts the evolution of living species all the way from 2.5 billion years ago, through the Triassic, Jurassic, and

Cretaceous periods and right through to today. With stunning full-color images and illustrations, this beautiful book is sure to fascinate and charm the young reader.
The Prime of Life Jul 29 2019 Steven Mintz reconstructs the emotional interior of a life stage too often relegated to self-help books and domestic melodramas. He describes the challenges of adulthood today and puts them into perspective by exploring how past generations achieved intimacy and connection, raised children, sought meaning in work, and responded to loss.
Origins of the Earth, Moon, and Life Mar 05 2020 Origins of the Earth, Moon, and Life in the Solar System: An Interdisciplinary Approach presents state-of-the-art knowledge that is based on theories, experiments, observations, calculations, and analytical data from five astro-sciences, astronomy, astrobiology, astrogeology, astrophysics, and cosmochemistry. Beginning with the origin of elements, and moving on to cover the formation of the early Solar System, the giant impact model of the Earth and Moon, the oldest records of life, and the possibility of life on other planets in the Solar System, this interdisciplinary reference provides a complex understanding of the planets and the formation of life. Synthesizing concepts from all branches of astro-sciences into one, the book is a valuable reference for researchers in astrogeology, astrophysics, cosmochemistry, astrobiology, astronomy, and other space science fields, helping users better understand the intersection of these sciences. Includes extensive figures and tables to enhance key concepts Uses callout boxes throughout to provide context and deeper explanations Presents up-to-date information on the universe, stars, planets, moons, and life in the solar system Combines knowledge from the fields of astrogeology, astrophysics, cosmochemistry, astrobiology, and astronomy, helping readers understand the origins of the Earth, the moon, and life in our solar system
Life and Evolution Aug 29 2019 This book offers to the international reader a collection of original articles of some of the most skillful historians and philosophers of biology currently working in Latin American universities. During the last decades, increasing attention has been paid in Latin America to the history and philosophy of biology, but since many local authors prefer to write in Spanish or in Portuguese, their ideas have barely crossed the boundaries of the continent. This volume aims to remedy this state of things, providing a good sample of this production to the English speaking readers, bringing together contributions from researchers working in Brazilian, Argentinean, Chilean, Colombian and Mexican universities. The stress on the regional provenance of the authors is not intended to suggest the existence of something like a Latin American history and philosophy of biology, supposedly endowed with distinctive features. On the contrary, the editors firmly believe that advances in this field can be achieved only by stimulating the integration in the international debate. Based on this assumption, the book focuses on two topics, life and evolution, and presents a selection of contributions addressing issues such as the history of the concept of life, the philosophical reflection on life manipulation and life extension, the structure and development of evolutionary theory as well as human evolution. Life and Evolution – Latin American Essays on the History and Philosophy of Biology will provide the international reader with a rather complete picture of the ongoing research in the history and philosophy of biology in Latin America, offering a snapshot of this dynamic community. It will also contribute to contextualize and develop the debate concerning life and evolution, and the relation between the two phenomena.
Life on a Young Planet Oct 12 2020 Australopithecines, dinosaurs, trilobites--such fossils conjure up images of lost worlds filled with vanished organisms. But in the full history of life, ancient animals, even the trilobites, form only the half-billion-year tip of a nearly four-billion-year iceberg. Andrew Knoll explores the deep history of life from its origins on a young planet to the incredible Cambrian explosion, presenting a compelling new explanation for the emergence of biological novelty. The very latest discoveries in paleontology--many of them made by the author and his students--are integrated with emerging insights from molecular biology and earth system science to forge a broad understanding of how the biological diversity that surrounds us came to be. Moving from Siberia to Namibia to the Bahamas, Knoll shows how life and environment have evolved together through Earth's history. Innovations in biology have helped shape our air and oceans, and, just as surely, environmental change has influenced the course of evolution, repeatedly closing off opportunities for some species while opening avenues for others. Readers go into the field to confront fossils, enter the lab to discern the inner workings of cells, and alight on Mars to ask how our terrestrial experience can guide exploration for life beyond our planet. Along the way, Knoll brings us up-to-date on some of science's hottest questions, from the oldest fossils and claims of life beyond the Earth to the hypothesis of global glaciation and Knoll's own unifying concept of "permissive ecology." In laying bare Earth's deepest biological roots, Life on a Young Planet helps us understand our own place in the universe--and our responsibility as stewards of a world four billion years in the making. In a new preface, Knoll describes how the field has broadened and deepened in the decade since the book's original publication.
Plant Evolution Jan 15 2021 Although plants comprise more than 90% of all visible life, and land plants and algae collectively make up the most morphologically, physiologically, and ecologically diverse group of organisms on earth, books on evolution instead tend to focus on animals. This organismal bias has led to an incomplete and often erroneous understanding of evolutionary theory. Because plants grow and reproduce differently than animals, they have evolved differently, and generally accepted evolutionary views—as, for example, the standard models of speciation—often fail to hold when applied to them. Tapping such wide-ranging topics as genetics, gene regulatory networks, phenotype mapping, and multicellularity, as well as paleobotany, Karl J. Niklas's Plant Evolution offers fresh insight into these differences. Following up on his landmark book The Evolutionary Biology of Plants—in which he drew on cutting-edge computer simulations that used plants as models to illuminate key evolutionary theories—Niklas incorporates data from more than a decade of new research in the flourishing field of molecular biology, conveying not only why the study of evolution is so important, but also why the study of plants is essential to our understanding of evolutionary processes. Niklas shows us that investigating the intricacies of plant development, the diversification of early vascular land plants, and larger patterns in plant evolution is not just a botanical pursuit: it is vital to our comprehension of the history of all life on this green planet.
Fossils Aug 22 2021 Discusses the formation of fossils, describes how they are used by scientists to reconstruct the history of the earth, and offers guidance on starting a fossil collection
Life Jul 01 2022 By one of Britain's most gifted scientists: a magnificently daring and compulsively readable account of life on Earth (from the "big bang" to the advent of man), based entirely on the most original of all sources--the evidence of fossils. With excitement and driving intelligence, Richard Fortey guides us from the barren globe spinning in space, through the very earliest signs of life in the sulphurous hot springs and volcanic vents of the young planet, the appearance of cells, the slow creation of an atmosphere and the evolution of myriad forms of plants and animals that could then be sustained, including the magnificent era of the dinosaurs, and on to the last moment before the debut of Homo sapiens. Ranging across multiple scientific disciplines, explicating in wonderfully clear and refreshing prose their findings and arguments--about the origins of life, the causes of species extinctions and the first appearance of man--Fortey weaves this history out of the most delicate traceries left in rock, stone and earth. He also explains how, on each aspect of nature and life, scientists have reached the understanding we have today, who made the key discoveries, who their opponents were and why certain ideas won. Brimful of wit, fascinating personal experience and high scholarship, this book may well be our best introduction yet to the complex history of life on Earth. A Book-of-the-Month Club Main Selection With 32 pages of photographs
Patterns and Processes in the History of Life Mar 29 2022 Hypothesis testing is not a straightforward matter in the fossil record and here, too interactions with biology can be extremely profitable. Quite simply, predictions regarding long-term consequences of processes observed in liv ing organisms can be tested directly using paleontological data if those liv ing organisms have an adequate fossil record, thus avoiding the pitfalls of extrapolative approaches. We hope to see a burgeoning of this interactive effort in the coming years. Framing and testing of hypotheses in paleon tological subjects inevitably raises the problem of inferring process from pattern, and the consideration and elimination of a broad range of rival hy is an essential procedure here. In a historical science such as potheses paleontology, the problem often arises that the events that are of most in terest are unique in the history of life. For example, replication of the metazoan radiation at the beginning of the Cambrian is not feasible. How ever, decomposition of such problems into component hypotheses may at least in part alleviate this difficulty. For example, hypotheses built upon the role of species packing might be tested by comparing evolutionary dy namics (both morphological and taxonomic) during

another global diversi fication, such as the biotic rebound from the end-Permian extinction, which removed perhaps 95% of the marine species (see Valentine, this volume). The subject of extinction, and mass extinction in particular, has become important in both paleobiology and biology.

Cowen's History of Life Feb 25 2022 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.

The Mansion of Happiness Jun 07 2020 Renowned Harvard scholar and New Yorker staff writer Jill Lepore has written a strikingly original, ingeniously conceived, and beautifully crafted history of American ideas about life and death from before the cradle to beyond the grave. How does life begin? What does it mean? What happens when we die? “All anyone can do is ask,” Lepore writes. “That’s why any history of ideas about life and death has to be, like this book, a history of curiosity.” Lepore starts that history with the story of a seventeenth-century Englishman who had the idea that all life begins with an egg, and ends it with an American who, in the 1970s, began freezing the dead. In between, life got longer, the stages of life multiplied, and matters of life and death moved from the library to the laboratory, from the humanities to the sciences. Lately, debates about life and death have determined the course of American politics. Each of these debates has a history. Investigating the surprising origins of the stuff of everyday life—from board games to breast pumps—Lepore argues that the age of discovery, Darwin, and the Space Age turned ideas about life on earth topsy-turvy. “New worlds were found,” she writes, and “old paradises were lost.” As much a meditation on the present as an excavation of the past, The Mansion of Happiness is delightful, learned, and altogether beguiling.