

## The Rise Of Fishes 500 Million Years Evolution

In a scientific pursuit there is continual food for discovery and wonder. M. Shelley (1818) Genomic analysis of aquatic species has long been overshadowed by the superb activity of the human genome project. However, aquatic genomics is now in the limelight as evidenced by the recent accomplishment of fugu genome sequencing, which provided a significant foundation for comparative fish genomics. Undoubt edly, such progress will provide an exciting and unparalleled boost to our knowl edge of the genetics of aquatic species. Thus, aquatic genomics research has become a promising new research field with an impact on the fishery industry. It is notewor thy that the Food and Agriculture Organization (FAO) of the United Nations has projected that current global fisheries production will soon become insufficient to supply the increasing world population and that aquaculture has a great potential to fulfill that demand. This book, Aquatic Genomic. -: Steps Toward a Great Future, was designed as a collection of advanced knowledge in aquatic genomics and biological sciences. It covers a variety of aquatic organisms including fish, crustaceans, and shellfish, and describes various advanced methodologies, including genome analysis, gene map ping, DNA markers, and EST analysis. Also included are discussions of many sub jects such as regulation of gene expression, stress and immune responses, sex differ entiation, hormonal control, and transgenic fishes.

The vertebrate head is the most complex part of the animal body and its diversity in nature reflects a variety of life styles, feeding modes, and ecological adaptations. This book will take you on a journey to discover the origin and diversification of the head, which evolved from a seemingly headless chordate ancestor. Despite their structural diversity, heads develop in a highly conserved fashion in embryos. Major sensory organs like the eyes, ears, nose, and brain develop in close association with surrounding tissues such as bones, cartilages, muscles, nerves, and blood vessels. Ultimately, this integrated unit of tissues gives rise to the complex functionality of the musculoskeletal system as a result of sensory and neural feedback, most notably in the use of the vertebrate jaws, a major vertebrate innovation only lacking in hagfishes and lampreys. The cranium subsequently further diversified during the major transition from fishes living in an aquatic environment to tetrapods living mostly on land. In this book, experts will join forces to integrate, for the first time, state-of-the-art knowledge on the anatomy, development, function, diversity, and evolution of the head and jaws and their muscles within all major groups of extant vertebrates. Considerations about and comparisons with fossil taxa, including emblematic groups such as the dinosaurs, are also provided in this landmark book, which will be a leading reference for many years to come.

Cichlid fishes are amazing creatures. In terms of sheer number of species, they are the most successful of all families of vertebrate animals, and the extent and speed with which they have evolved in some African lakes has made them the darlings of evolutionary biologists. But what truly captivates biologists like George Barlow -- not to mention thousands of aquarists the world over -- is the complexity of their social lives and their devotion to family (most species of cichlids are monogamous and many pairs share the responsibility of raising offspring). In this wonderful book, Barlow describes the unusually high intelligence of these fishes, their complex mating and parenting rituals, their bizarre feeding and fighting habits, and the unusual adaptations and explosive rate of speciation that have enabled them to proliferate and flourish. A celebration of their diversity, The Cichlid Fishes is also a marvelous exploration of how these unique animals might help resolve the age-old puzzle of how species arise and evolve.

This is the second monograph by the author on biological materials of marine origin. The initial book is dedicated to the biological materials of marine invertebrates. This work is a source of modern knowledge on biomineralization, biomimetics and materials science with respect to marine vertebrates. For the first time in scientific literature the author gives the most coherent analysis of the nature, origin and evolution of biocomposites and biopolymers isolated from and observed in the broad variety of marine vertebrate organisms (fish, reptilian, birds and mammals) and within their unique hierarchically organized structural formations. There is a wealth of new and newly synthesized information, including dozens of previously unpublished images of unique marine creatures including extinct, extant and living taxa and their biocomposite-based structures from nano- to micro - and macroscale. This monograph reviews the most relevant advances in the marine biological materials research field, pointing out several approaches being introduced and explored by distinct modern laboratories.

An Introduction to Biology for Everyone

The Billfish Story

Volume 1

A True Story of Power, Obsession, and the World's Most Coveted Fish

Migration Ecology of Marine Fishes

Steps Toward a Great Future

This edited volume reviews our past and present understanding of the ecology of Australian freshwater fishes. It compares patterns and processes in Australia with those on other continents, discusses the local relevance of ecological models from the northern hemisphere and considers how best to manage our species and their habitats in the face of current and future threats. In view of these challenges, the need for redress is urgent. The chapters are written by some of our foremost researchers and managers, developing themes that underpin our knowledge of the ecology, conservation and management of fish and fish habitats. For each theme, the authors formulate a synthesis of what is known, consider the need for new perspectives and identify gaps and opportunities for research, monitoring and management. The themes have an Australian context but draw upon ideas and principles developed by fish biologists in other parts of the world. The science of freshwater fish ecology in Australia has grown rapidly from its roots in natural history and taxonomy. This book offers an introduction for students, researchers and managers, one that the authors hope will carry Australian fish biology and resource management to new levels of understanding.

Biological Science Fundamentals and Systematics is a component of Encyclopedia of Biological, Physiological and Health Sciences in the global Encyclopedia of Life Support Systems (EOLSS), which is an integrated compendium of twenty one Encyclopedias. The Theme on Biological Science Fundamentals and Systematics provides the essential aspects and a myriad of issues of great relevance to our world such as: History and Scope of Biological Sciences; The Origin and Evolution of Early Life; Evolution; Classification and Diversity of Life Forms; Systematics of Microbial Kingdom (s) and Fungi; Systematic Botany; Systematic Zoology; Invertebrates; Systematic Zoology: Vertebrates which are then expanded into multiple subtopics, each as a chapter. These four volumes are aimed at the following five major target audiences: University and College students Educators, Professional practitioners, Research personnel and Policy analysts, managers, and decision makers and NGOs.

Humans now wield a greater influence on the planet than any other species in history, and human-developed technologies like genetic engineering and artificial intelligence stand poised to overtake biological evolution. Just how did we arrive at this unique moment in human history, 14 billion years after the birth of the universe Sydney Brenner's 10-on-10: The Chronicles of Evolution brings together 24 prominent scientists and thinkers to trace the story of evolution through ten logarithmic scales of time. Through expert insights, this unique volume considers how humans found our place in the cosmos, and imagines what lies ahead.Published by Wildtype Books and distributed by World Scientific Publishing Co.

The Biology of Lungfishes presents an up-to-date collection of reviews on some of the most important aspects of the life of lungfishes. The book draws on contributions from well-known experts with a long record of scientific work within their respective fields. The general natural history of the three genera of lungfishes, the fascinating fossil story, and modern ideas of lungfish phylogeny form the main part of the text. The book also covers the morphology and physiology of various organs.

Practising Observation and Documentation

Ecology and Conservation of Fishes

The Physiology of Fishes

Applications of Evolutionary Theory

Human Evolution

The Quest for an Answer

Take your knowledge of fishes to the next level Fishes of the World, Fifth Edition is the only modern, phylogenetically based classification of the world’s fishes. The updated text offers new phylogenetic diagrams that clarify the relationships among fish groups, as well as cutting-edge global knowledge that brings this classic reference up to date. With this resource, you can classify orders, families, and genera of fishes, understand the connections among fish groups, organize fishes in their evolutionary context, and imagine new areas of research. To further assist your work, this text provides representative drawings, many of them new, for most families of fishes, allowing you to make visual connections to the information as you read. It also contains many references to the classical as well as the most up-to-date literature on fish relationships, based on both morphology and molecular biology. The study of fishes is one that certainly requires dedication—and access to reliable, accurate information. With more than 30,000 known species of sharks, rays, and bony fishes, both lobe-finned and ray-finned, you will need to master your area of study with the assistance of the best reference materials available. This text will help you bring your knowledge of fishes to the next level. Explore the anatomical characteristics, distribution, common and scientific names, and phylogenetic relationships of fishes Access biological and anatomical information on more than 515 families of living fishes Better appreciate the complexities and controversies behind the modern view of fish relationships Refer to an extensive bibliography, which points you in the direction of additional, valuable, and up-to-date information, much of it published within the last few years Fishes of the World, Fifth Edition is an invaluable resource for professional ichthyologists, aquatic ecologists, marine biologists, fish breeders, aquaculturists, and conservationists.

The billfish is fixed at the apex of the oceanic food chain. Composed of sailfish, marlin, spearfish, and swordfish, they roam the pelagic waters of the Atlantic and are easily recognized by their long, spear-like beaks. Noted for their speed, size, and acrobatic jumps, billfish have for centuries inspired a broad spectrum of society. Even in antiquity, Aristotle, who assiduously studied the swordfish, named this gladiator of the sea xiphias—the sword. The Billfish Story tells the saga of this unique group of fish and those who have formed bonds with them—relationships forged by anglers, biologists, charter-boat captains, and conservationists through their pursuit, study, and protection of these species. More than simply reciting important discoveries, Stan Ulanski argues passionately that billfish occupy a position of unique importance in our culture as a nexus linking natural and human history. Ulanski, both a scientist and an angler, brings a rich background to the subject in a multifaceted approach that will enrich not only readers’ appreciation of billfish but the whole of the natural world.

A riveting journey into the bizarre world of the Asian arowana or “dragon fish” the world’s most expensive aquarium fish—reveals a surprising history with profound implications for the future of wild animals and human beings alike. The Dragon Behind the Glass tells the story of a fish like none other: a powerful predator dating to the age of the dinosaurs. Treasured as a status symbol believed to bring good luck, the Asian arowana is bred on high-security farms in Southeast Asia and sold by the hundreds of thousands each year. In the United States, however, it’s protected by the Endangered Species Act and illegal to bring into the country—though it remains the object of a thriving black market. From the South Bronx to Singapore, journalist Emly Voigt follows the trail of the fish, ultimately embarking on a years-long quest to find the arowana in the wild, venturing deep into some of the last remaining tropical wildernesses on earth. In an age when freshwater fish now comprise one of the most rapidly vanishing groups of animals on the planet, Voigt unearths a paradoxical truth behind the dragon fish’s rise to fame—one that calls into question how we protect the world’s rarest species. An elegant exploration of the human conquest of nature, The Dragon Behind the Glass revels in the sheer wonder of life’s diversity and lays bare our deepest desire—to hold onto what is wild.

Hagfishes and lampreys, both examples of jawless fishes, are elongated, eel-like animals lacking paired fins, and are the only living representatives of ancient creatures that gave rise to current species of fish and, eventually, humans. This volume provides an overview of the current status of knowledge on a variety of topics related to jawless fishes, including their taxonomy, zoogeography, phylogeny, molecular biology, evolution, life history, role in the ecosystem, and fisheries and management of hagfishes and lampreys worldwide. This is the first book dealing exclusively with the various aspects of jawless fish species throughout the world. It brings together a number of papers providing new data on jawless fishes, and offers readers a range of useful information within a single reference, reflecting the growing appreciation for hagfishes and lampreys worldwide.

Fish Physiology: Primitive Fishes

Evolution and Development of Fishes

The Fish Classes

Dinosaurs of Australia and New Zealand and Other Animals of the Mesozoic Era

Jawless Fishes of the World

Swordfish, Sailfish, Marlin, and Other Gladiators of the Sea

*Arranged logically to follow the most widely adopted course structure, this text will leave students with a full understanding of the unique structure, function, and living patterns of all vertebrates.*

*"Darwin's book on evolution admitted that "intermediate links" were "perhaps the most obvious and serious objection to the theory" of evolution. Darwin recognized that the fossils collected by scientists prior to 1859 did not correspond with his theory of evolution, but he predicted that his theory would be confirmed as more and more fossils were found. One hundred and fifty years later, Evolution: The Grand Experiment critically examines the viability of Darwin's theory"--*

*World-class palaeontologists and biologists summarise the state-of-the-art on fish evolution and development.*

*Written as a stand-alone textbook for students and a useful reference for professionals in government and private agencies, academic institutions, and consultants, Ecology and Conservation of Fishes provides broad, comprehensive, and systematic coverage of all aquatic systems from the mountains to the oceans. The book begins with overview discussions on the ecology, evolution, and diversity of fishes. It moves on to address freshwater, estuarine, and marine ecosystems and identifies factors that affect the distribution and abundance of fishes. It then examines the adaptations of fishes as a response to constraints posed in ecosystems. The book concludes with four chapters on applied ecology to discuss the critical issues of management, conservation, biodiversity crises, and climate change. Major marine fisheries have collapsed, and there are worldwide declines in freshwater fish populations. Fishery scientists and managers must become more effective at understanding and dealing with resource issues. If not, fish species, communities, and entire ecosystems will continue to decline as habitats change and species are lost. Ecology and Conservation of Fishes has taken a historical and functional approach to explain how we got where we are, providing old and new with a better foundation as ecologists and conservationists, and most importantly, it awakens senses of purpose and need. Past management practices are reviewed, present programs considered, and the need for incorporating principles of applied ecology in future practices is emphasized.*

*Systematics, Taxonomy, Natural History, and Conservation*

*Heads, Jaws, and Muscles*

*Freshwater Fishes of North-Eastern Australia*

*Fish Physiology: Nitrogen Excretion*

*Aquatic Genomics*

*The Biology of Lungfishes*

This book documents the rich and spectacular heritage of the Australian continent over the last 4400 million years. Now in its third edition, The Geology of Australia provides a comprehensive overview of Australia's geology, landscapes and Earth resources. Beginning with the Precambrian rocks that hold clues to the origins of life and the development of an oxygenated atmosphere, it goes on to cover the warm seas, volcanism and episodes of mountain building that formed the eastern third of the Australian continent. This illuminating history details the breakup of the supercontinents Rodinia and Gondwana, the times of previous glaciations, the development of climates and landscapes in modern Australia, and the creation of the continental shelves and coastlines. This third edition features two new chapters on geological time and Paleozoic orogenic rock systems and mountain building, and new and updated illustrations and full-colour images.

In Origins, Frank H. T. Rhodes explores the origin and evolution of living things, the changing environments in which they have developed, and the challenges we now face on an increasingly crowded and polluted planet.

Everybody Out of the Pond At the Water’s Edge will change the way you think about your place in the world. The awesome journey of life’s transformation from the first microbes 4 billion years ago to Homo sapiens today is an epic that we are only now beginning to grasp. Magnificent and bizarre, it is the story of how we got here, what we left behind, and what we brought with us. We all know about evolution, but it still seems absurd that our ancestors were fish. Darwin’s idea of natural selection was the key to solving generation-to-generation evolution -- microevolution -- but it could only point us toward a complete explanation, still to come, of the engines of macroevolution, the transformation of body shapes across millions of years. Now, drawing on the latest fossil discoveries and breakthrough scientific analysis, Carl Zimmer reveals how macroevolution works. Escorting us along the trail of discovery up to the current dramatic research in paleontology, ecology, genetics, and embryology, Zimmer shows how scientists today are unveiling the secrets of life that biologists struggled with two centuries ago. In this book, you will find a dazzling, brash literary talent and a rigorous scientific sensibility gracefully brought together. Carl Zimmer provides a comprehensive, lucid, and authoritative answer to the mystery of how nature actually made itself.

A detailed guide of everything you want and need to know about fish. A fish is a water-dwelling vertebrate with gills that doesn't change form, as amphibians do, during its life. Most are cold-blooded, though some (such as some species of tuna and shark) are warm-blooded. There are over 29,000 species of fish, making them the most diverse group of vertebrates. Fishing is the activity of hunting for fish. Fishing is a very ancient practice that dates back at least to the Mesolithic period which began about 10,000 years ago. Fishing is the activity of hunting for fish. By extension, the term fishing is also applied to hunting for other aquatic animals such as various types of shellfish as well as squid, octopus, turtles, frogs and some edible marine invertebrates. Fish as a food describes the edible parts of water-dwelling, cold-blooded vertebrates with gills, as well as certain other water-dwelling animals such as mollusks, crustaceans, and shellfish. An aquarium (plural aquariums or aquaria) is a vivarium, usually contained in a clear-sided container (typically constructed of glass or high-strength plastic) in which water-dwelling plants and animals (usually fish, and sometimes invertebrates, as well as amphibians, marine mammals, and reptiles) are kept in captivity, often for public display; or it is an establishment featuring such displays. A detailed guide of everything you want and need to know about fish.

500 Million Years of Evolution

The Cichlid Fishes

Pragmatic Evolution

Nature's Grand Experiment In Evolution

Chordate Zoology

The Rise of Fishes

*First Published in 2000. Routledge is an imprint of Taylor & Francis, an informa company.*

*Freshwater Fishes of North-Eastern Australia provides details of the ecology, systematics, biogeography and management of 79 species of native fish present in the region. It includes detailed information on their identification, evolutionary history, breeding biology, feeding ecology, movement patterns, macro-, meso- and micro-habitat use, water quality tolerances, conservation status and current threats, as well as environmental flow and management needs. Based on the results of extensive field surveys and a comprehensive review of existing literature, it is designed to assist environmental practitioners and managers to make informed decisions about future management strategies. It will also encourage a greater research effort into the region's aquatic fauna by providing a comprehensive resource that enables other researchers to adopt a more quantitative and strategic framework for their research. Joint winner of the 2005 Whitley Medal.*

*Of what use is evolutionary science to society? Can evolutionary thinking provide us with the tools to better understand and even make positive changes to the world? Addressing key questions about the development of evolutionary thinking, this book explores the interaction between evolutionary theory and its practical applications. Featuring contributions from leading specialists, Pragmatic Evolution highlights the diverse and interdisciplinary applications of evolutionary thinking: their potential and limitations. The fields covered range from palaeontology, genetics, ecology, agriculture, fisheries, medicine, neurobiology, psychology and animal behaviour; to information technology, education, anthropology and philosophy. Detailed examples of useful and current evolutionary applications are provided throughout. An ideal source of information to promote a better understanding of contemporary evolutionary science and its applications, this book also encourages the continued development of new opportunities for constructive evolutionary applications across a range of fields.*

*This book provides a comprehensive collection of timely reviews of our current understanding of the fundamental principles of nitrogen metabolism and excretion in fish. Emphasis is placed on critical assessment of how new studies impact these topics, and the articles reflect the diversity of current research approaches.*

*Origins*

*Using the Past to Study the Present*

*Expeditions as Experiments*

*Ecology of Australian Freshwater Fishes*

*The Dragon Behind the Glass*

*Vertebrates*

It will profoundly affect the way paleontologists and climatologists view the lives of ancient mammals.

The fifth edition of The Physiology of Fishes represents a compendium of knowledge across fish physiology, collecting up-to-date research into an easy-to-access single textbook. Written by the leaders in the field, it provides a comprehensive, accessible review of the core topics, integrating physiology with environmental science, ecology, evolution, and molecular cell biology. New chapters address Epigenetics, Biomechanics and Locomotion, and Behaviour and Learning. Each chapter contains an extensive bibliography, providing readers with the best sources from the primary literature. Almost three decades after the publication of the first edition, this book remains the only published single-volume work on fish physiology. The fifth edition provides an important reference for new students of fish biology, marine and freshwater biologists, ichthyologists, fisheries scientists, and comparative physiologists.

Primitive fishes are a relatively untapped resource in the scientific search for insights into the evolution of physiological systems in fishes and higher vertebrates. Volume 26 in the Fish Physiology series presents what is known about the physiology of these fish in comparison with the two fish groups that dominate today, the modern elasmobranchs and the teleosts. Chapters include reviews on what is known about cardiovascular, nervous and ventilatory systems, gas exchange, ion and nitrogenous waste regulation, muscles and locomotion, endocrine systems, and reproduction. Editors provide a thorough understanding of how these systems have evolved through piscine and vertebrate evolutionary history. Primitive Fishes includes ground-breaking information in the field, including highlights of the most unusual characteristics amongst the various species, which might have allowed these fishes to persist virtually unchanged through evolutionary time. This volume is essential for all comparative physiologists, fish biologists, and paleontologists. Provides an analysis of the evolutionary significance of physiological adaptations in "ancient fishes" Offers insights on the evolution of higher vertebrates The only single source that presents an in-depth discussion of topics related to the physiology of ancient fishes

FOR B.Sc & B.Sc.(Hons) CLASSES OF ALL INDIAN UNIVERSITIES AND ALSO AS PER UGC MODEL CURRICULUMN Contents: CONTENTS:Protochordates:Hemichordata 1.Urochordata Cephalochordata Vertebrates : Cyclostomata 3. Agnatha, Pisces Amphibia 4. Reptilia 5. Aves Mammalia 7 Comparative Anatomy:Integumentary System 8 Skeletal System Coelom and Digestive System 10

Respiratory System 11. Circulatory System Nervous System 13. Receptor Organs 14 Endocrine System 15 Urinogenital System 16 Embryology Some Comparative Charts of Protochordates 17 Some Comparative Charts of Vertebrate Animal Types 18 Index.

Biological Materials of Marine Origin

The Geology of Australia

Anatomical, Functional, and Developmental Diversity in Chordate Evolution

Encyclopedia of Paleontology

At the Water's Edge

Mammalian Paleoecology

*"Explores the habitats, life cycles, and other characteristics of animals in the Fish classes"--Provided by publisher.*

*This book on ancient fishes unites the work of many specialists coming from different areas of biology. Hagfishes, lungfishes, Chondrosteans, and Holosteans constitute the main subject of study. Fossil records and extant species are compared to establish the conservation or the degeneration of specific characters. However, phylogenetic relationships have mostly been revisited in the light of new molecular and developmental data. The morphology of several organs is also revisited. This volume includes a phylogenetic account of the cardiac outflow tract, and the particulars of the heart and circulation in lungfishes. The control of breathing and the lung-swim bladder issue is discussed. The developmental anatomy of the sturgeon gut and accounts of the gut structure in lungfishes and garfishes are also included.*

*Biochemical and physiological aspects of the behavior of lungfishes and gars are presented. Reports on the fish olfactory system, and on the amazing slime glands of hagfishes, are also covered.*

*The Rise of Fishes*500 Million Years of Evolution

*The last decade has seen an explosive burst of new information about human origins and our evolutionary status with respect to other species. We have long been considered unique as upright, bipedal creatures endowed with language, the ability to use tools, to think and introspect. We now know that other creatures may be more or less capable of similar behaviour, and that these human capacities in many cases have long evolutionary trajectories. Our information about such matters comes from a diverse variety of disciplines, including experimental and neuropsychology, primatology, ethology, archaeology, palaeontology, comparative linguistics and molecular biology. It is the interdisciplinary nature of the newly-emerging information which bears upon one of the profoundest scientific human questions - our origin and place in the animal kingdom, whether unique or otherwise - which makes the general topic so fascinating to layperson, student, and expert alike. The book attempts to integrate across a wide range of disciplines an evolutionary view of human psychology, with particular reference to language, praxis and aesthetics. A chapter on evolution, from the appearance of life to the earliest mammals, is followed by one which examines the appearance of primates, hominids and the advent of bipedalism. There follows a more detailed account of the various species of Homo, the morphology and origin of modern H. sapiens sapiens as seen from the archaeological/palaeontological and molecular-biological perspectives. The origins of art and an aesthetic sense in the Acheulian and Mousterian through to the Upper Palaeolithic are seen in the context of the psychology of art. Two chapters on language address its nature and realization centrally and peripherally, the prehistory and neuropsychology of speech, and evidence for speech and/or language in our hominid ancestors. A chapter on tool use and praxis examines such behaviour in other species, primate and non-primate, the neurology of praxis and its possible relation to language.*

*Encephalization and the growth of the brain, phylogenetically and ontogenetically, and its relationship to intellectual capacity leads on finally to a consideration of intelligence, social intelligence, consciousness and self awareness. A final chapter reviews the issues covered. The book, of around 70.000 words of text, includes over 500 references over half of which date from 1994 or later.*

*Fishes of the World*

*BIOLOGICAL SCIENCE FUNDAMENTALS AND SYSTEMATICS - Volume IV*

*Sydney Brenner's 10-on-10: The Chronicles Of Evolution*

*Vertebrate Biology*

*Fish & Fishing*

**Every 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.**

**This collection focuses on different expeditions and their role in the process of knowledge acquisition from the eighteenth century onwards. It investigates various forms of scientific practice conducted during, after and before expeditions, and it places this discussion into the scientific context of experiments. In treating expeditions as experiments in a heuristic sense, we also propose that the expedition is a variation on the laboratory in which different practices can be conducted and where the transformation of uncertain into certain knowledge is tested. The experimental positioning of the expedition brings together an ensemble of techniques, strategies, material agents and social actors, and illuminates the steps leading from observation to facts and documentation. The chapters show the variety of scientific interests that motivated expeditions with their focus on natural history, geology, ichthyology, botany, zoology, helminthology, speleology, physical anthropology, oceanography, meteorology and magnetism.**

**After volume 33, this book series was replaced by the journal "Evolutionary Biology." Please visit [www.springer.com/11692](http://www.springer.com/11692) for further information. This volume continues bringing to readers the findings of eminent evolutionary biologists and paleobiologists. Among the topics discussed in this book are the origin of the dermal skeleton in conodont chordates, patterns of nucleotide substitution and codon usage in plasmid DNA evolution, a model to explain phenotype stability in functional systems, and inter-island speciation of Hawaiian biota.**

**Any divide between revelation and rationality, religion and logic has to be irrational. If religion and rationality cannot proceed hand in hand, there has to be something deeply wrong with either of the two. Does revelation play any vital role in human affairs? Is not rationality sufficient to guide man in all the problems which confront him? Numerous questions such as these are examined with minute attention. All major issues which intrigue the modern mind are attempted to be incorporated in this fascinatingly comprehensive statute. Whatever the intellectual or educational background of the reader, this book is bound to offer him something of his interest. It examines a very diverse and wide range of subjects including the concept of revelation in different religions, history of philosophy, cosmology, extraterrestrial life, the future of life on earth, natural selection and its role in evolution. It also elaborately discusses the advent of the Messiah, or other universal reformers, awaited by different religions. Likewise, many other topical issues which have been agitating the human mind since time immemorial are also incorporated. The main emphasis is on the ability of the Quran to correctly discuss all important events of the past, present and future from the beginning of the universe to its ultimate end. Aided by strong incontrovertible logic and scientific evidence, the Quran does not shy away from presenting itself to the merciless scrutiny of rationality. It will be hard to find a reader whose queries are not satisfactorily answered. We hope that most readers will testify that this will always stand out as a book among books - perhaps the greatest literary achievement of this century.**

**Revelation, Rationality, Knowledge & Truth**

**Evolutionary Biology**

**Fish with Fingers, Whales with Legs, and How Life Came Ashore but Then Went Back to Sea**

**Fossils and Strata, Morphology, Phylogeny and Taxonomy of Osteolepiform Fish**

**Tales of Intrepid Fossil Hunters and the Wonders of Evolution**

**Phylogeny, Anatomy and Physiology of Ancient Fishes**

*Traces the evolution of fishes over five hundred million years, and explains how scientists interpret fossil remains*

*A synthetic treatment of all marine fish taxa (teleosts and elasmobranchs), this book employs explanatory frameworks from avian and systems ecology while arguing that migrations are emergent phenomena, structured through schooling, phenotypic plasticity, and other collective agencies. The book provides overviews of the following concepts: ; The comparative movement ecology of fishes and birds ; The alignment of mating systems with larval dispersal ; Schooling and migration as adaptations to marine food webs ; Natal homing ; Connectivity in populations and metapopulations ; The contribution of migration ecology to population resilience*

*Describes vertebrate life in Australia and New Zealand during the Mesozoic period, including amphibians, birds, and mammals, as well as dinosaurs and other reptiles.*

*The Story of Life in 25 Fossils*

*The Search for Our Prehistoric Past*

*Evolution: the Grand Experiment*