

Animal Eyes Oxford Animal Biology

Offers an introductory, but comprehensive, account of all known types of eye, in a book whose size and style made it accessible to both undergraduate and postgraduate students, as well as established researchers in the field. This edition is updated throughout to include developments made within the last 10 years, whilst retaining the structure and scope that has made it so popular.

Mary Roach meets Bill Bryson in this "surefire summer winner" (Janet Maslin, New York Times), an uproarious tour of the basest instincts and biggest mysteries of the animal world. Humans have gone to the Moon and discovered the Higgs boson, but when it comes to understanding animals, we've still got a long way to go. Whether we're seeing a viral video of romping baby pandas or a picture of penguins "holding hands," it's hard for us not to project our own values--innocence, fidelity, temperance, hard work--onto animals. So you've probably never considered if moose get drunk, penguins cheat on their mates, or worker ants lay about. They do--and that's just for starters. In *The Truth About Animals*, Lucy Cooke takes us on a worldwide journey to meet everyone from a Colombian hippo castrator to a Chinese panda porn peddler, all to lay bare the secret--and often hilarious--habits of the animal kingdom. Charming and at times downright weird, this modern bestiary is perfect for anyone who has ever suspected that virtue might be unnatural.

Animal Physiology: An Environmental Perspective provides a broad review of animal physiology, demonstrating how an understanding of the physiology of animals in their natural habitats helps us to understand how and why animals evolved the way they did, as well as how we can protect them from the extreme effects of changes to their environments. The only text to take an evolutionary approach to show how physiological systems allow animals to adapt to their changing environments. The main narrative focuses on key concepts, and panels expand on particular topics or themes, helping students to grasp difficult concepts in a progressive, layered way. A robust yet accessible introduction to the physical and chemical properties of the environments in which animals live helps students to avoid a superficial or confused understanding of this often challenging aspect of the subject. Carefully chosen examples illustrate how different groups of animals have evolved different solutions to deal with the environmental problems they face. The exploration of real world issues such as climate change and pollution from the point of view of their physiological effects on animals shows how our understanding of such topics can be translated into new approaches to conservation.

Additional Resources: For students:- Original articles: a list of original articles consulted during the writing of each chapter so that you can explore the original research for yourself.- Additional case studies and experimental approach panels to augment those in the printed book.- Answers to numerical questions: full solutions to numerical questions so that you can verify your working. For registered adopters of the text:- Digital image library: Includes electronic files in JPG format of every illustration, photo, graph and table from the text

This textbook is intended for use in a course for undergraduate students in biology, neuroscience or psychology who have had an introductory course on the structure and function of the nervous system. Its primary purpose is to provide a working vocabulary

and knowledge of the biology of vision and to acquaint students with the major themes in biological vision research. Part I treats the eye as an image-forming organ and provides an overview of the projections from the retina to key visual structures of the brain. Part II examines the functions of the retina and its central projections in greater detail, building on the introductory material of Part I. Part III treats certain special topics in vision that require this detailed knowledge of the structure and properties of the retina and visual projections.

An introductory overview of the functional biology of fish and how that may be affected by the contrasting habitat conditions within the aquatic environment. It describes the recent advances in comparative animal physiology which have greatly influenced our understanding of fish function as well as generating questions that have yet to be resolved. Fish taxa represent the largest number of vertebrates, with over 25,000 extant species. However, much of our knowledge, apart from taxonomy and habitat descriptions, has been based on relatively few of these species, usually those which live in fresh water and/or are of commercial interest.

Unfortunately there has also been a tendency to base interpretation of fish physiology on that of mammalian systems, as well as to rely on a few type species of fish. This accessible textbook will redress the balance by using examples of fish from a wide range of species and habitats, emphasizing diversity as well as recognizing shared attributes with other vertebrates.

Banish your fears of statistical analysis using this clearlywritten and highly successful textbook. Statistics for Veterinary and Animal Science Third Edition is an introductory text which assumes no previous knowledge of statistics. It starts with very basic methodology and builds on it to encompass some of the more advanced techniques that are currently used. This book will enable you to handle numerical data and critically appraise the veterinary and animal science literature. Written in a non-mathematical way, the emphasis is on understanding the underlying concepts and correctly interpreting computer output, and not on working through mathematical formulae. Key features: Flow charts are provided to enable you to choose the correct statistical analyses in different situations Numerous real worked examples are included to help you master the procedures Two statistical packages, SPSS and Stata, are used to analyse data to familiarise you with typical computer output The data sets from the examples in the book are available as electronic files to download from the book's companion website in ASCII, Excel, SPSS, Stata and R Workspace formats, allowing you to practice using your own software and fully get to grips with the techniques A clear indication is provided of the more advanced or obscure topics so that, if desired, you can skip them without loss of continuity. New to this edition: New chapter on reporting guidelines relevant to veterinary medicine as a ready reference for those wanting to follow best practice in planning and writing up research New chapter on critical appraisal of randomized controlled trials and observational studies in the published literature: a template is provided which is used to critically appraise two papers New chapter introducing specialist topics: ethical issues of animal investigations, spatial statistics, veterinary surveillance, and statistics in molecular and quantitative genetics Expanded glossaries of notation and terms Additional exercises and further explanations added throughout to make the book more comprehensive. Carrying out statistical procedures and interpreting the results is an integral part of veterinary and animal science. This is the only book on statistics that is specifically written for veterinary science and animal science students, researchers

and practitioners.

"Comprehensive, contemporary, and engaging, *Animal Physiology* provides evolutionary and ecological context to help students make connections across all levels of physiological scale"--

Animal Osmoregulation collates a widely dispersed literature to produce a comprehensive and authoritative synthesis of the field, providing detailed examples of osmoregulatory processes at the organismal, organ and cellular level. It incorporates clear background information on ion regulation and transport (specifically in the light of recent molecular studies) and illustrates the physical principles to which each organism must adhere, as well as the phylogenetic constraints within which it must operate.

Anthrozoology, the study of human-animal interactions (HAIs), has experienced substantial growth during the past 20 years and it is now timely to synthesise what we know from empirical evidence about our relationships with both domesticated and wild animals. Two principal points of focus have become apparent in much of this research. One is the realisation that the strength of these attachments not only has emotional benefits for people, but confers health benefits as well, such that a whole area has opened up of using companion animals for therapeutic purposes. The other is the recognition that the interactions we have with animals have consequences for their welfare too, and thus impact on their quality of life. Consequently we now study HAIs in all scenarios in which animals come into contact with humans, whether as pets/companions, farm livestock, laboratory animals, animals in zoos, or in the wild. This topical area of study is of growing importance for animals in animal management, animal handling, animal welfare and applied ethology courses, and also for people within psychology, anthropology and human geography at both the undergraduate and postgraduate level. It will therefore be of interest to students, researchers, and animal managers across the whole spectrum of human-animal contact.

In nature, trickery and deception are widespread. Animals and plants mimic other objects or species in the environment for protection, trick other species into rearing their young, lure prey to their death, and deceive potential mates for reproduction. Cuckoos lay eggs carefully matched to their host's own clutch. Harmless butterflies mimic the wing patterning of a poisonous butterfly to avoid being eaten. The deep-sea angler fish hangs a glowing, fleshy lure in front of its mouth to draw the attention of potential prey, while some male fish alter their appearance to look like females in order to sneak past rivals in mating. Some orchids develop the smell of female insects in order to attract pollinators, while carnivorous plants lure insects to their death with colourful displays. In this book, Martin Stevens describes the remarkable range of such adaptations in nature, and considers how they have evolved, and become increasingly perfected as part of an arms race between predator and prey or host and parasite. He explores the work of naturalists and biologists from Alfred Russel Wallace to current research, showing how scientists find ways of testing the impact of

particular behaviours and colourings on the animals it is meant to fool, as opposed to our human perceptions. Drawing on a wide range of examples, Stevens considers what deception tells us about the process of evolution and adaptation. Examines the philosophical aspects of the treatment of animals and argues that animals have a basic moral right to respectful treatment

Read and discover all about young animals. What color are baby zebras? Where do young bears live? Read and discover more about the world! This series of non-fiction readers provides interesting and educational content, with activities and project work.

Martin Stevens explores the extraordinary variety of senses in the animal kingdom, and discusses the cutting-edge science that is shedding light on these secret worlds. Our senses of vision, smell, taste, hearing, and touch are essential for us to respond to threats, communicate and interact with the world around us. This is true for all animals - their sensory systems are key to survival, and without them animals would be completely helpless. However, the sensory systems of other animals work very differently from ours. For example, many animals from spiders to birds can detect and respond to ultraviolet light, to which we are blind. Other animals, including many insects, rodents, and bats can hear high-frequency ultrasonic sounds well beyond our own hearing range. Many other species have sensory systems that we lack completely, such as the magnetic sense of birds, turtles, and other animals, or the electric sense of many fish. These differences in sensory ability have a major bearing on the ways that animals behave and live in different environments, and also affect their evolution and ecology. In this book, Martin Stevens explores the remarkable sensory systems that exist in nature, and what they are used for. Discussing how different animal senses work, he also considers how they evolve, how they are shaped by the environment in which an animal lives, and the pioneering science that has uncovered how animals use their senses. Throughout, he celebrates the remarkable diversity of life, and shows how the study of sensory systems has shed light on some of the most important issues in animal behaviour, physiology, and evolution. The Oxford Animal Biology Series is an innovative new series of supplementary undergraduate texts in comparative animal biology. Topics within each book are addressed using examples from throughout the animal kingdom, looking for parallels that transcend taxonomy. Further reading sections will guide the student into the literature at greater depth. The series will be international in scope, both in terms of the species used as examples and in references to scientific work. Energy for Animal Life, the first book in the series, is about how animals get energy, and how they use it, a central topic in our understanding of animal biology. Life depends on energy, and much of the activity of animals is devoted to getting the food which is their energy source. It encompasses the food chain, from solar radiation and photosynthesis to food sources for herbivores and for carnivores, and compares the merits of different designs of digestive system, and of

different strategies for finding and choosing food. Of course, animal energy isn't simply a question of feeding, and several chapters in turn look at energy use. The energy costs of motion - of running, swimming, and flight - are discussed in one chapter, and the energetic demands of growth and reproduction in another. A chapter on body temperature shows how the processes of life go faster at higher temperatures, and discusses how animals regulate their temperature. A final chapter draws all of these aspects of energy use together, and considers the energy budgets of several different animals, assessing the different energy gains and costs of their everyday activities in the wild. The book is truly comparative, drawing on examples from a wide range of animal species, and lots of practical information on relevant experiments is included. The style is very accessible, and suitable as supplementary reading for first and second year undergraduates taking a degree course in biological sciences.

The distribution and classification of life on earth has long been of interest to biological theorists, as well as to travellers and explorers. Cladistic biogeography is the study of the historical and evolutionary relationships between species, based on their particular distribution patterns across the earth. Analysis of the distributions of species in different areas of the world can tell us how those species and areas are related, what regions or larger groups of areas exist, and what their origins might be. The first edition of Cladistic Biogeography was published in 1986. It was a concise exposition of the history, methods, applications of, and prospects for cladistic biogeography. Well reviewed, and widely used in teaching, Cladistic Biogeography is still in demand, despite having been out of print for some time. This new edition draws on a wide range of examples, both plant and animal, from marine, terrestrial, and freshwater habitats. It has been updated throughout, with the chapters being rewritten and expanded to incorporate the latest research findings and theoretical and methodological advances in this dynamic field.

Oxygen uptake for metabolic energy demand and the elimination of the resulting carbon dioxide is one of the essential processes in all higher life forms; in the case of animals, everything from protozoans to insects and vertebrates including humans. Respiratory Biology of Animals provides a contemporary and truly integrative approach to the topic, adopting a strong evolutionary theme. It covers aerobic metabolism at all levels, from gas exchange organs such as skin, gills, and lungs to mitochondria - the site of cellular respiration. The book also describes the functional morphology and physiology of the circulatory system, which often contains gas-carrying pigments and is important for pH regulation in the organism. A final section describes the evolution of animal respiratory systems. Throughout the book, examples are selected from the entire breadth of the animal kingdom, identifying common themes that transcend taxonomy.

Why are animal signals reliable? This is the central problem for evolutionary biologists interested in signals. Of course, not all signals are reliable; but most are, otherwise receivers of signals would ignore them. A number of theoretical answers have been

proposed and empirical studies made, but there still remains a considerable amount of confusion. The authors, one a theoretician the other a fieldworker, introduce a sense of order to this chaos. A significant cause of confusion has been the tendency for different researchers to use either the same term with different meanings, or different terms with the same meaning. The authors attempt to clarify these differences. A second cause of confusion has arisen because many biologists continue to assume that there is only one correct explanation for signal reliability. The authors argue that the reliability of signals is maintained in several ways, relevant in different circumstances, and that biologists must learn to distinguish between them. In this book they explain the different theories, give examples of signalling systems to which one or another theory applies, and point to the many areas where further work, both theoretical and empirical, is required.

Construction behaviour occurs across the entire spectrum of the animal kingdom and affects the survival of both builders and other organisms associated with them. *Animal Architecture* provides a comprehensive overview of the biology of animal building. The book recognizes three broad categories of built structure: homes, traps, and courtship displays. Even though some of these structures are complex and very large, the behaviour required to build them is generally simple and the anatomy for building unspecialized. Standardization of building materials helps to keep building repertoires simple, while self-organizing effects help create complexity. In a case-study approach to function, insects demonstrate how homes can remain operational while they grow, spiderwebs illustrate mechanical design, and the displays of bowerbirds raise the possibility of persuasion through design rather than just decoration. Studies of the costs to builders provide evidence of optimal designs and of trade-offs with other life history traits. As ecosystem engineers, the influence of builders is extensive and their effect is generally to enhance biodiversity through niche construction. Animal builders can therefore represent model species for the study of the emerging subject of environmental inheritance. Building, and in particular building with silk, has been demonstrated to have important evolutionary consequences. This book is intended for students and researchers in comparative animal biology, but will also be of relevance and use to the increasing numbers of architects and civil engineers interested in developing ideas from the animal kingdom.

This is the first modern textbook of sensory ecology in two decades, one of the most popular and rapidly growing subjects in biology. The topic deals with how animals capture (and send) information from their environment, and the sensory systems involved. It investigates the type of information that is gathered by animals, how it is used in a range of behaviours, and the evolution of such traits. Sensory ecology deals with both mechanistic questions (e.g. how sensory receptors capture information from the environment, and how the physical attributes of the environment affect information transmission) and functional questions (e.g. the adaptive significance of the information used by the animal to make a decision). Sensory ecology covers the full range of sensory systems and types of sensory information (sound, visual, chemical, magnetic, electric etc.). The latest research has dealt more explicitly with how sensory systems may actually drive evolutionary change, including the formation of new species. This book provides an introduction to the key ideas, theories, and examples, describes how sensory systems work, and explores the links between the senses, animal signals, behaviour, and evolution.

Despite originating over than two-and-a-half thousand years ago, Aesop's Fables are still passed on from parent to child, and are embedded in our collective consciousness. The morals we have learned from these tales continue to inform our judgements, but have the stories also informed how we regard their animal protagonists? If so, is there any truth behind the stereotypes? Are wolves deceptive villains? Are crows insightful geniuses? And could a tortoise really beat a hare in a race? In *Aesop's Animals*, zoologist Jo Wimpenny turns a critical eye to the fables to discover whether there is any scientific truth to Aesop's portrayal of the animal kingdom. She brings the tales into the twenty-first century, introducing the latest findings on some of the most fascinating branches of ethological research – the study of why animals do the things they do. In each chapter she interrogates a classic fable and a different topic – future planning, tool use, self-recognition, cooperation and deception – concluding with a verdict on the veracity of each fable's portrayal from a scientific perspective. By sifting fact from fiction in one of the most beloved texts of our culture, *Aesop's Animals* explores and challenges our preconceived notions about animals, the way they behave, and the roles we both play in our shared world.

"The evolution of the eye spans 3.75 billion years from single cell organisms with eyespots to Metazoa with superb camera style eyes. At least ten different ocular models have evolved independently into myriad optical and physiological masterpieces. The story of the eye reveals evolution's greatest triumph and sweetest gift. This book describes its journey"--Provided by publisher.

What is animal welfare? Why has it proved so difficult to find a definition that everyone can agree on? This concise and accessible guide is for anyone who is interested in animals and who has wondered how we can assess their welfare scientifically. It defines animal welfare as 'health and animals having what they want', a definition that can be easily understood by scientists and non-scientists alike, expresses in simple words what underlies many existing definitions, and shows what evidence we need to collect to improve animal welfare in practice. Above all, it puts the animal's own point of view at the heart of an assessment of its welfare. But, can we really understand what animals want? A consistent theme running through the book is that not only is it possible to establish what animals want, but that this information is vital in helping us to make sense of the long and often confusing list of welfare measures that are now in use such as 'stress' and 'feel good hormones', expressive sounds and gestures, natural behaviour, cognitive bias, and stereotypies. Defining welfare as 'health and what animals want' allows us to distinguish between measures that are simply what an animal does when it is alert, aroused, or active and those measures that genuinely allow us to distinguish between situations the animals themselves see as positive or negative. Sentience (conscious feelings of pleasure, pain, and suffering) is for many people the essence of what is meant by welfare, but studying consciousness is notoriously difficult, particularly in non-human species. These difficulties are discussed in the context of our current - and as yet incomplete - knowledge of human and animal consciousness. Finally, the book highlights some key ideas in the relationship between animal welfare science and animal ethics and shows how closely the well-being of humans is linked to that of other animals. *The Science of Animal Welfare* is an ideal companion for undergraduate and graduate students taking courses in animal behaviour and welfare, as well as for professional researchers, practitioners and animal welfare consultants. At the same time, it is easily understandable

to non-scientists and anyone without prior knowledge but with an interest in animals and the rapidly evolving science of animal welfare.

This book introduces the reader to the power of observation before, and sometimes instead of, experimental manipulation in the study of animal behaviour. It starts with simple and easily accessible methods suitable for student projects, before going on to demonstrate the possibilities that now exist for far more sophisticated analyses of observational data. At a time when animal welfare considerations are attracting political as well as scientific debate, the potential for non-intrusive studies on animals is being increasingly recognized. Observation emerges as a valuable alternative approach, often yielding highly informative results in situations (such as on zoos, farms or for wild animals) where more invasive experimental techniques would be undesirable, unethical or just plain impossible. However, to justify its place alongside experimentation as a rigorous scientific method, observation needs to be just as disciplined and systematic and have just as much attention paid to project design in the way that observations are made and recorded. *Observing Animal Behaviour* takes the reader through all these stages: from the initial observations, to the formulation of hypotheses, and their subsequent testing with further systematic observations. Although designed principally as a companion text for advanced undergraduate and students taking courses in animal behaviour, this accessible text will be essential reading for anyone wanting to study animal behaviour using observational methods rather than experimentation, and assumes no previous knowledge of animals, statistics or scientific method. It will be of particular relevance and use to those professional researchers and consultants in the behavioural sciences who seek a compact but comprehensive introduction to the quantitative observation of animal behaviour.

Despite its obvious advantages, our ability to be self-reflective comes at a high price. Few people realize how profoundly their lives are affected by self-reflection or how frequently inner chatter interferes with their success, pollutes their relationships with others, and undermines their happiness. By allowing people to ruminate about the past or imagine what might happen in the future, self-reflection conjures up a great deal of personal suffering in the form of depression, anxiety, anger, jealousy, and other negative emotions. A great deal of unhappiness, in the form of addictions, overeating, and domestic violence, is due to people's inability to exert control over their thoughts and behavior. Is it possible to direct our self-reflection in a way that will minimize the disadvantages and maximize the advantages? Is there a way to affect the egotistical self through self-reflection? In this volume, Mark Leary explores the personal and social problems that are created by the capacity for self-reflection, and by drawing upon psychology and other behavioral sciences, offers insights into how these problems can be minimized.

Visual ecology is the study of how animals use visual systems to meet their ecological needs, how these systems have evolved, and how they are specialized for particular visual tasks. *Visual Ecology* provides the first up-to-date synthesis of the field to appear in more than three decades. Featuring some 225 illustrations, including more than 140 in color, spread throughout the text, this comprehensive and accessible book begins by discussing the basic properties of light and the optical environment. It then looks at how photoreceptors intercept light and convert it to usable biological signals, how the pigments and cells of vision vary among animals, and how the properties of these components

affect a given receptor's sensitivity to light. The book goes on to examine how eyes and photoreceptors become specialized for an array of visual tasks, such as navigation, evading prey, mate choice, and communication. A timely and much-needed resource for students and researchers alike, *Visual Ecology* also includes a glossary and a wealth of examples drawn from the full diversity of visual systems. The most up-to-date overview of visual ecology available. Features some 225 illustrations, including more than 140 in color, spread throughout the text. Guides readers from the basic physics of light to the role of visual systems in animal behavior. Includes a glossary and a wealth of real-world examples.

Animal life, now and over the past half billion years, is incredibly diverse. Describing and understanding the evolution of this diversity of body plans - from vertebrates such as humans and fish to the numerous invertebrate groups including sponges, insects, molluscs, and the many groups of worms - is a major goal of evolutionary biology. In this book, a group of leading researchers adopt a modern, integrated approach to describe how current molecular genetic techniques and disciplines as diverse as palaeontology, embryology, and genomics have been combined, resulting in a dramatic renaissance in the study of animal evolution. The last decade has seen growing interest in evolutionary biology fuelled by a wealth of data from molecular biology. Modern phylogenies integrating evidence from molecules, embryological data, and morphology of living and fossil taxa provide a wide consensus of the major branching patterns of the tree of life; moreover, the links between phenotype and genotype are increasingly well understood. This has resulted in a reliable tree of relationships that has been widely accepted and has spawned numerous new and exciting questions that require a reassessment of the origins and radiation of animal life. The focus of this volume is at the level of major animal groups, the morphological innovations that define them, and the mechanisms of change to their embryology that have resulted in their evolution. Current research themes and future prospects are highlighted including phylogeny reconstruction, comparative developmental biology, the value of different sources of data and the importance of fossils, homology assessment, character evolution, phylogeny of major groups of animals, and genome evolution. These topics are integrated in the light of a 'new animal phylogeny', to provide fresh insights into the patterns and processes of animal evolution. *Animal Evolution* provides a timely and comprehensive statement of progress in the field for academic researchers requiring an authoritative, balanced and up-to-date overview of the topic. It is also intended for both upper level undergraduate and graduate students taking courses in animal evolution, molecular phylogenetics, evo-devo, comparative genomics and associated disciplines.

Through Our Eyes Only? is an immensely engaging exploration of one of the greatest remaining biological mysteries: the possibility of conscious experiences in non-human animals. Dawkins argues that the idea of consciousness in other species has now progressed from a vague possibility to a plausible, scientifically respectable view. Written in an accessible and entertaining style, this book aims to show how near -- and how far -- we are to understanding what goes on in the minds of other animals. 'Her approach ... is impeccable ... Her writing is highly accessible, lively and illustrative.' - Booklist on the hardback edition.

Animal Eyes Oxford University Press

This is a comparative account of all the types of eye in the animal kingdom, which includes their optical systems, form and function, ecology and evolution. -- book cover.

The visual world of animals is highly diverse and often very different from that of humans. This book provides an extensive review of the latest behavioral and neurobiological research on animal vision, detailing fascinating species similarities and differences in visual processing.

Conservation physiology is a rapidly expanding, multidisciplinary field that utilizes physiological knowledge and tools to understand and solve

conservation challenges. This novel text provides the first consolidated overview of its scope, purpose, and applications, with a focus on wildlife. It outlines the major avenues and advances by which conservation physiology is contributing to the monitoring, management, and restoration of wild animal populations. This book also defines opportunities for further growth in the field and identifies critical areas for future investigation. By using a series of global case studies, contributors illustrate how approaches from the conservation physiology toolbox can tackle a diverse range of conservation issues including the monitoring of environmental stress, predicting the impact of climate change, understanding disease dynamics, improving captive breeding, and reducing human-wildlife conflict. Moreover, by acting as practical road maps across a diversity of sub-disciplines, these case studies serve to increase the accessibility of this discipline to new researchers. The diversity of taxa, biological scales, and ecosystems highlighted illustrate the far-reaching nature of the discipline and allow readers to gain an appreciation for the purpose, value, applicability, and status of the field of conservation physiology. Conservation Physiology is an accessible supplementary textbook suitable for graduate students, researchers, and practitioners in the fields of conservation science, eco-physiology, evolutionary and comparative physiology, natural resources management, ecosystem health, veterinary medicine, animal physiology, and ecology.

Arising from the 2019 Darwin College Lectures, this book presents essays from seven prominent public intellectuals on the theme of vision. Each author examines this theme through the lens of their own particular area of expertise, making for a lively interdisciplinary volume including chapters on neuroscience, colour perception, biological evolution, astronomy, the future of technology, computer vision, and the visionary core of science. Featuring contributions by professors of neuroscience Paul Fletcher and Anya Hurlbert, professor of zoology Dan-Eric Nilsson, the futurist Sophie Hackford, Microsoft distinguished scientist Andrew Blake, theoretical physicist and author Carlo Rovelli, and Dr Carolin Crawford, the Public Astronomer at the University of Cambridge, this volume will be of interest to anybody curious about how we see the world.

With fascinating, spectacularly beautiful images, the book piques readers' curiosity about the diversity of visual organs. This book is the result of a dual approach – scientific as well as aesthetic. The compelling images are accompanied by an easy-to-read, understandable text, aimed at both scientists and the educated public, and generally anyone interested in the beauty of nature. Thanks to this combination, the book presents the staggering diversity of eyes in the animal kingdom and provides countless insights into the intriguing mechanisms at work – from simple pigment cups to independently flexible, telescopic, facet and lens eyes. Educational, exciting, entertaining till the last page, this is a book for anyone who is interested in evolution, nature and the miracle of life.

Animal Eyes provides a comparative account of all known types of eye in the animal kingdom, outlining their structure and function with an emphasis on the nature of the optical systems and the physical principles involved in image formation. A universal theme throughout the book is the evolution and taxonomic distribution of each type of eye, and the roles of different eye types in the behaviour and ecology of the animals that possess them. In comparing the specific capabilities of eyes, it considers the factors that lead to good resolution of detail and the ability to function under a wide range of light conditions. This new edition is fully updated throughout, incorporating more than a decade of new discoveries and research.

Few arguments in biomedical experimentation have stirred such heated debate in recent years as those raised by animal research. In this comprehensive analysis of the social, political, and ethical conflicts surrounding the use of animals in scientific experiments, Barbara Orlans judges both ends of the spectrum in this debate -- unconditional approval or rejection of animal experimentation -- to be untenable. Instead of arguing for either view, she thoughtfully explores the ground between the extremes, and convincingly makes the case for public policy reforms that serve to improve the welfare of laboratory animals without jeopardizing scientific endeavor. This book presents controversial issues in a balanced manner based on careful historical analysis and original research. Different mechanisms of oversight for animal experiments are compared and those that have worked well are identified. This compelling work will be of interest to biomedical scientists, ethicists, animal welfare advocates and other readers concerned with this critical issue.

This book covers the way that all known types of eyes work, from their optics to the behaviour they guide. The ways that eyes sample the world in space and time are considered, and the evolutionary origins of eyes are discussed. This new edition incorporates discoveries made since the first edition published in 2001.

Optics--a field of physics focusing on the study of light--is also central to many areas of biology, including vision, ecology, botany, animal behavior, neurobiology, and molecular biology. The Optics of Life introduces the fundamentals of optics to biologists and nonphysicists, giving them the tools they need to successfully incorporate optical measurements and principles into their research. Sönke Johnsen starts with the basics, describing the properties of light and the units and geometry of measurement. He then explores how light is created and propagates and how it interacts with matter, covering topics such as absorption, scattering, fluorescence, and polarization. Johnsen also provides a tutorial on how to measure light as well as an informative discussion of quantum mechanics. The Optics of Life features a host of examples drawn from nature and everyday life, and several appendixes that offer further practical guidance for researchers. This concise book uses a minimum of equations and jargon, explaining the basic physics of light in a succinct and lively manner. It is the essential primer for working biologists and for anyone seeking an accessible introduction to optics. Some images inside the book are unavailable due to digital copyright restrictions.

This is a comprehensive overview of wild and free-living giraffes. Graham Mitchell combines nearly every piece of published research about this species into the pages of this book, making it an incredibly useful book for researchers, scientists, and naturalists studying a single species.

Animal Eyes aims to provide a comprehensive account of all known types of eye. It takes the diversity of optical mechanisms as a framework, but many other aspects of the structure and function of eyes are examined. Visual ecology, for example, the way that eyes are specifically adapted to the lifestyles of the animals that bear them, is another important theme. The 'design philosophy' of eyes is explored, too: what are the physical constraints on the way that an eye performs its functions, and how are these addressed by the different types of eye? Early and closing chapters look at the properties of light critical to vision, and factors in eye adaptation like spatial resolution, sensitivity, and movement, while the central sections assess the capabilities of a wide variety

of eye types.

[Copyright: f412332a620818f2ac423553b6eb5734](https://www.oxfordjournals.org/doi/10.1093/acprof:oso/9780198505829.003.0001)