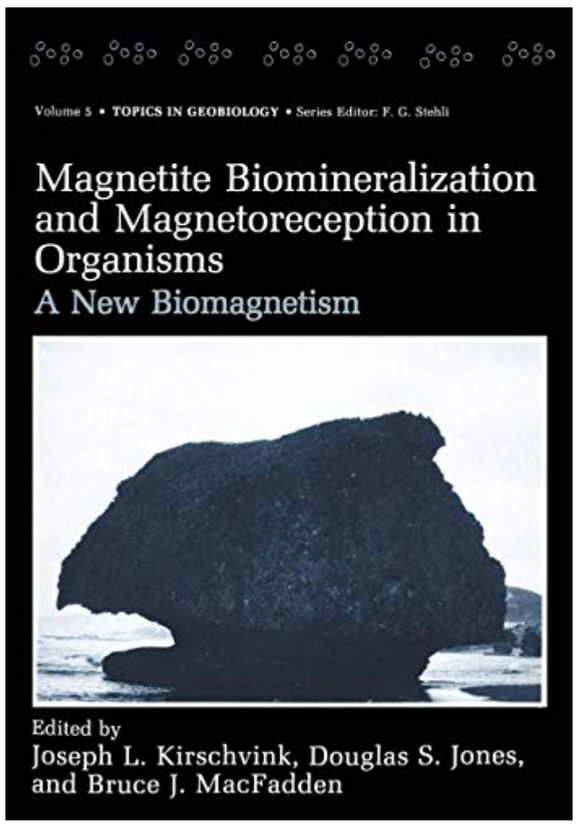

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Magnetite Biomineralization and Magnetoreception in Organisms-Joseph L. Kirschvink 2013-04-17 The mystery of how migrating animals find their way over unfamiliar terrain has intrigued people for centuries, and has been the focus of productive research in the biological sci ences for several decades. Whether or not the earth's magnetic field had anything to do with their navigational abilities has sufaced and been dismissed several times, beginning at least in the mid to late 1800s. This topic generally remained out of the mainstream of scientific research for two reasons: (1) The apparent irreproducibility of many of the be havioral experiments which were supposed to demonstrate the existence of the magnetic sense; and (2) Perceived theoretical difficulties which were encountered when biophysi cists tried to understand how such a sensory system might operate. However, during the mid to late 1960s as the science of ethology (animal behavior) grew, it became clear from studies on bees and birds that the geomagnetic field is used under a variety of conditions. As more and more organisms were found to have similar abilities, the problem shifted back to the question as to the basis of this perception. Of the various schemes for trans ducing the geomagnetic field to the nervous system which have been proposed, the hy pothesis of magnetite-based magnetoreception discussed at length in this volume has per haps the best potential for explaining a wide range of these effects, even though this link is as yet clear only in the case of magnetotactic bacteria.

Sensing in Nature-Carlos López-Larrea 2012-03-07 Biological systems are an emerging discipline that may provide integrative tools by assembling the hierarchy of interactions among genes, proteins and molecular networks involved in sensory systems. The aim of this volume is to provide a picture, as complete as possible, of the current state of knowledge of sensory systems in nature. The presentation in this book lies at the intersection of evolutionary biology, cell and molecular biology, physiology and genetics. Sensing in Nature is written by a distinguished panel of specialists and is intended to be read by biologists, students, scientific investigators and the medical community.

Magnetoreception and Magnetosomes in Bacteria-Dirk Schüler 2006-10-19 This volume details recent developments in magnetotactic bacteria research. It includes reviews on the formation and organization of magnetosomes, the genes controlling magnetosome biomineralization, and new cryogenic techniques to visualize novel cytoskeleton structures. Coverage also describes potential nanobiotechnological applications of the magnetosome crystals.

Iron Biominerals-R. Blakemore 2013-06-29

A Program for the Microsoft Windows Environment to Collect Analog-to-digital and Serial Communication Data on a Personal Computer Based System-Robert C. Holland 1992

Bioelectromagnetics- 1992

Magnetic Orientation in Animals-Roswitha Wiltschko 2012-12-06 Biological effects of magnetic fields have been studied in many animals and plants. The magnetic fields were of a wide intensity range and, as alternating fields, of a wide frequency range and of a variety of impulse shapes. Effects on the cellular level, on bio chemical processes, growth and development, interactions with physiology, sensory input, reflexes and rhythm control, to name just a few, have been reported. Numerous magnetically induced changes in behavior have also been described. Recently, the amount of literature covering biological effects of magnetic fields has been rapidly increasing. By now it has grown to such an extent that it can no longer be covered in one volume. Most reviews specialize and focus on particular aspects and/or types of fields or effects. For example, the book edited by MARET et al. (1986) gives an overview on biological effects of steady magnetic fields, MISAKIAN et al. (1993) reviewed those of extremely low frequency magnetic fields, focusing on in vitro effects. BERN HARD (1992) reported on 'electromagnetic smog' in view of pos sible effects on human health and well-being, and a series of papers edited by AMEMIYA (1994) summarizes Japanese research on effects of electromagnetic fields ranging from extern ely low to ultra-high frequencies. TENFORDE (1979) and ADEY (1981) sum marized and discussed tissue interactions, REITER (1993a) neu roendocrine and neurochemical changes associated with various kinds of electromagnetic fields. The book edited by KIRSCHVINK et al.

Iron Oxides-Damien Faivre 2016-08-08 Compiling all the information available on the topic, this ready reference covers all important aspects of iron oxides. Following a preliminary overview chapter discussing iron oxide minerals along with their unique structures and properties, the text goes on to deal with the formation and transformation of iron oxides, covering geological, synthetic, and biological formation, as well as various physicochemical aspects. Subsequent chapters are devoted to characterization techniques, with a special focus on X-ray-based methods, magnetic measurements, and electron microscopy alongside such traditional methods as IR/Raman and Mössbauer spectroscopy. The final section mainly concerns exciting new applications of magnetic iron oxides, for example in medicine as microswimmers or as water filtration systems, while more conventional uses as pigments or in biology for magnetoreception illustrate the full potential. A must-read for anyone working in the field.

Avian Navigation: Pigeon Homing as a Paradigm-Hans G. Wallraff 2005-01-12 How migratory birds can navigate home from their wintering grounds to their breeding sites over hundreds and thousands of kilometres has been an admired mystery over more than a century. Profound advances towards a solution of this problem have been achieved with a model bird, the homing pigeon. This monograph summarizes our current knowledge about pigeon homing, about the birds' application of a sun compass and a magnetic compass, of a visual topographical map within a familiar area and -- most surprisingly -- of an olfactory map using atmospheric chemosignals as indicators of position in distant unfamiliar areas.

Electromagnetic Fields-Martin Blank 1995 Thus, epidemiological studies suggest that children living near electric power lines have an increased risk of leukemia, and clinical studies show that low-energy, pulsed EMFs accelerate healing of bone fractures. The mechanisms underlying these effects are not yet understood, but in vitro studies show that low-energy EMFs induce changes in protein syntheses that are similar to the stress response found normally in all cells. This 26-chapter book provides a comprehensive survey of the multifaceted issues raised by environmental EMFs by looking at physical and biological fundamentals of EMFs, health risks and benefits of exposure, and biophysical and biochemical mechanisms of interaction.

Journal of Mammalogy- 1994

Magnetism in Medicine-Wilfried Andrä 2007-02-27 This second, completely updated and extended edition of the only reference work in this growing field of medical physics focuses on biomagnetic instrumentation as well as applications in cardiology and neurology. New chapters have been added on fetal magnetography and magnetic field therapy, as well as the safety aspects of magnetic fields. Written by well-known specialists from Germany, USA, Canada, Japan, the Netherlands and Scandinavia, the result is a manual for researchers in this field as well as for those who apply modern methods based on magnetism in medical practice. It equally provides a detailed overview for newcomers to the field as well as for experts familiar with only one part of the area.

The Prokaryotes-Edward F. DeLong 2014-11-19 The Prokaryotes is a comprehensive, multi-authored, peer reviewed reference work on Bacteria and Achaea. This fourth edition of The Prokaryotes is organized to cover all taxonomic diversity, using the family level to delineate chapters. Different from other resources, this new Springer product includes not only taxonomy, but also prokaryotic biology and technology of taxa in a broad context. Technological aspects highlight the usefulness of prokaryotes in processes and products, including biocontrol agents and as genetics tools. The content of the expanded fourth edition is divided into two parts: Part 1 contains review chapters dealing with the most important general concepts in molecular, applied and general prokaryote biology; Part 2 describes the known properties of specific taxonomic groups. Two completely new sections have been added to Part 1: bacterial communities and human bacteriology. The bacterial communities section reflects the growing realization that studies on pure cultures of bacteria have led to an incomplete picture of the microbial world for two fundamental reasons: the vast majority of bacteria in soil, water and associated with biological tissues are currently not culturable, and that an understanding of microbial ecology requires knowledge on how different bacterial species interact with each other in their natural environment. The new section on human microbiology deals with bacteria associated with healthy humans and bacterial pathogenesis. Each of the major human diseases caused by bacteria is reviewed, from identifying the pathogens by classical clinical and non-culturing techniques to the biochemical mechanisms of the disease process. The 4th edition of The Prokaryotes is the most complete resource on the biology of prokaryotes.

Biomineralization-Stephen Mann 1989 This book presents a chemical and biochemical perspective on the formation and function of inorganic solids in biological systems - bones, teeth, shells, magnets etc. Biomineralization is covered at a molecular level, including aspects of control and regulation of crystal chemical processes involved in, for example, calcification, silicification, and iron oxide formation occuring in unicellular and multicellular organisms. In their contributions, leading scientists combine bioinorganic chemistry, solid-state chemistry and biology to provide the reader with a unified state-of-the-art approach.

Magnetobiology-Vladimir N. Binhi 2002-03-08 People are immersed in electromagnetic fields from such sources as power lines, domestic appliances, mobile phones, and even electrical storms. All living beings sense electric fields, but the physical origins of the phenomenon are still unclear. Magnetobiology considers the effects of electromagnetic fields on living organisms. It provides a comprehensive review of relevant experimental data and theoretical concepts, and discusses all major modern hypotheses on the physical nature of magnetobiological effects. It also highlights some problems that have yet to be solved and points out new avenues for research. Why do some people feel unwell during a lightning storm? Why is there a correlation between the level of electromagnetic background and the incidence of cancer? Why do so many medical centers use electromagnetic exposures to treat a wide variety of disorders in humans? The international scientific community is extremely interested in a theory of magnetobiology and the answers to these and other questions, as evidenced by the growing number of research associations in the United States, Europe, and other parts of the world. The World Health Organization (WHO) has named electromagnetic contamination in occupational and residential areas as a stress factor for human beings. This book stands out among recent texts on magnetobiology because it draws on a strong foundation of empirical and theoretical evidence to explain the various effects of magnetic fields on the human body. It contains the first comprehensive collection of experimental data bearing physical information, frequency and amplitude/power spectra, and original research data on how electromagnetic fields interfere with ions and molecules inside the proteins of living organisms. Introduction is written so that it will be understandable to a wide scientific community regardless of their specialisation First comprehensive collection of experimental data bearing physical information, frequency and amplitude/power spectra Original theoretical research data on the interference of ions and molecules inside proteins Appendix covers physical questions most relevant for magnetobiology. In particular there is an original exposition of the magnetic resonance basic principles

Fish Larval Physiology-Roderick Nigel Finn 2008-01-07 Fish larvae (and fish embryos) are not small juveniles or adults. Rather they are transitionary organisms that bridge the critical gap between the single-celled egg and sexually immature juvenile. This book explains how fish larvae develop and differentiate and how they regulate salt, water and acid-base balance.

Proceedings- 2009

Animal Learning-M. E. Bitterman 2012-12-06 For ten days, a number of neuroscientists met at Reisensburg to attend a series of lectures and discussions, an Institute, on animal learning. The students were drawn from a wide variety of disciplines, including anatomy, biochemistry, pharmacology, physiol ogy and zoology. It is probably true to say that many of them had at best a sketchy knowledge about the learning behavior of animals, about the conditions which are necessary for learning to take place and about the theories that psychologists have constructed about the learning processes. Was the Institute of any benefit to those neuro scientists whose interests lay in studying the functioning of the nervous system by manipulating it or probing it in some direct way? Some twenty years ago the answer to this question would probably have been "No"; and there is a very good reason why this view might have been held, especially by students of the mammalian nervous system. At that time most investigators used anaesthetised animals, or animals immobilized in some other way such as by surgically isolating the brain from the spinal cord, by dividing the brain at various levels or through the use of paralyzing agents. These con ditions achieved two things. On the one hand, they allowed sub stantial advances to be made, particularly in the analysis of sensory processing and in the analysis of the neuronal mechanisms of relatively simple reflex action. On the other hand, the experi mental conditions virtually eliminated complex behavior.

Magnetic Nanomaterials-Stefan H Bossmann 2017-06-02 Magnetic nanomaterials have undergone a significant evolution during the past decade, with supramolecular nanoparticle organization reaching unprecedented levels of complexity and the materials providing new approaches to treating cancer. Magnetic Nanomaterials will provide a comprehensive overview of the latest research in the area of magnetic nanoparticles and their broad applications in synthesis, catalysis and theranostics. The book starts with an introduction to magnetism in nanomaterials and magnetic nanoparticle design followed by individual chapters which focus on specific uses. Applications covered include drug delivery, theranostic agents for cancer treatment as well as catalysis, biomass conversion and catalytic enhancement of NMR sensitivity. The reader will have the opportunity to learn about the frontier of magnetic nanotechnology from scientists that have shaped this unique and highly collaborative field of research. Written and edited by experts working within the field across the world, this book will appeal to students and researched interested in nanotechnology, engineering and physical sciences.

Australian Journal of Zoology- 1997

Sensory Abilities of Cetaceans-Jeanette A. Thomas 2013-11-11 This book evolved through the efforts of several organizations and the dedication of many individuals. In 1987, we received arequest to propose a workshop topic for the Fifth International Theriological Congress (ITC) to be held in August 1989 in Rome, Italy. After looking up the meaning of the word "theriological" in the dictionary and discovering that it pertains to mammalian behavior, we decided a symposium on sensory abilities of whales and dOlphins would be an interesting topic. The ITC convenes only every five years and has the distinction of being very weIl attended by scientists from around the world. We thought that hosting a workshop in conjunction with the ITC would attract a variety of international scientists that rarely have the opportunity to interact. Fortunately for all involved, our prediction was correct. The first two days of the workshop, 23-24 August 1989, were held in conjunction with ITC and the nearly 1,000 attending scientists were able to view our posters and listen to lectures. The third day was limited to only ab out 65 invited scientists who were divided into topical working groups chaired by a rapporteur.

Journal of Experimental Biology- 1999

Science progress- 1990

The Journal of Experimental Biology- 2006

Handbook of Biomineralization-Peter Behrens 2009-09-28 This first comprehensive overview of the modern aspects of biomineralization represents life and materials science at its best: Bioinspired pathways are the hot topics in many disciplines and this holds especially true for biomineralization. Here, the editors -- well-known members of associations and prestigious institutes -- have assembled an international team of renowned authors to provide first-hand research results. This second volume deals with biometic model systems in biomineralization, including the biomineral approach to bionics, bioinspired materials synthesis and bio-supported materials chemistry, encapsulation and the imaging of internal nanostructures of biominerals. An interdisciplinary must-have account, for biochemists, bioinorganic chemists, lecturers in chemistry and biochemistry, materials scientists, biologists, and solid state physicists.

Proceedings of the Ocean Drilling Program-Ocean Drilling Program 1990

Journal of the Royal Society, Interface- 2006

Amphibian Biology: Sensory perception-Harold Heatwole 1998

Migration-David Checkley 1985 Proceedings of a symposium held 30 October to 2 November 1983 at the University of Texas Marine Science Institute at Port Aransas, Tex., as a part of the centennial celebration of the University of Texas.--Pref.

Studia biophysica- 1987

Nature-Sir Norman Lockyer 1869

Animal Learning & Behavior- 1987

Journal of Molecular Microbiology and Biotechnology- 1999

Effects of EMFs from Undersea Power Cables on Elasmobranchs and Other Marine Species: Final Report-T. Tricas 2012-12-01

Biomineralization in Lower Plants and Animals-Barry S. C. Leadbeater 1986 The Monera and Protista Kingdoms contain species that form many different mineral types by varying processes at different cellular locations. This book identifies the underlying trends and processes common to each group. It discusses the controls, products, and functional significance of biomineralization for such simple organisms as algae, protozoans, bacteria, and lichens--information useful to botanists, zoologists, paleontologists, and research chemists.

Animal Migration, Navigation, and Homing-Klaus Schmidt-Koenig 1978

Biological Effects of Static Magnetic Fields-Xin Zhang 2017-04-20 The book summarizes the emerging topic about the effects of SMF on biological samples ranging from single molecules, subcellular compartments, and cells to whole organisms, as well as the potential application of SMF in clinical treatment of cancer and other diseases. With the development and growing popularity of modern appliances, including MRI in the hospitals, the potential impact of magnetic fields on human health is invoking increasing concerns. At the same time, SMF has been used in the clinical treatment of tumors and other diseases for decades. However, there are still some reservations and uncertainties about these treatments, which are largely due to the differential biological effects reported in the literature. These experimental inconsistencies are mainly caused by variations such as different magnetic field types, intensities, treatment time as well as biological samples examined. This volume will help clarify some dilemmas in this field and encourage further investigations in order to achieve a better understanding of the biological effects of SMF, aiming for a rational application of SMF in clinical therapy in the near future. The book is useful for scientists doctors, and students who are interested in magnetic fields and life sciences.

Electromagnetic Fields and Circadian Rhythmicity-Kevin Dowd 1992 The idea of free (or laissez-faire) banking has enjoyed a remarkable renaissance in recent years. It is a radical idea that challenges much of what many monetary and banking scholars still take for granted - that banking is inherently unstable, that the banking system needs a lender of last resort or deposit insurance to defend it in a crisis, and that the government has to protect the value of the currency. Against this free banking sets an argument which is in essence very simple: if markets are generally better at allocating resources than governments, then what is different about money and the industry that provides it and why should they be treated differently?

High Resolution Stratigraphy-E. A. Hailwood 1993

Handbook of Biomineralization-Edmund Bäuerlein 2007 This first comprehensive overview of the modern aspects of biomineralization represents life and materials science at its best: Bioinspired pathways are the hot topics in many disciplines and this holds especially true for biomineralization. Here, the editor has assembled an international team of renowned authors to provide first-hand research results. This first of three volumes deals with the biology of biominerals structure formation, with sections on silica-hydrated polysilicondioxide, iron sulfides and oxides, calcium carbonates and sulfates, as well as calcium phosphates. An interdisciplinary must-have account, for biochemists, bioinorganic chemists, lecturers in chemistry and biochemistry, materials scientists, biologists, and solid state physicists.