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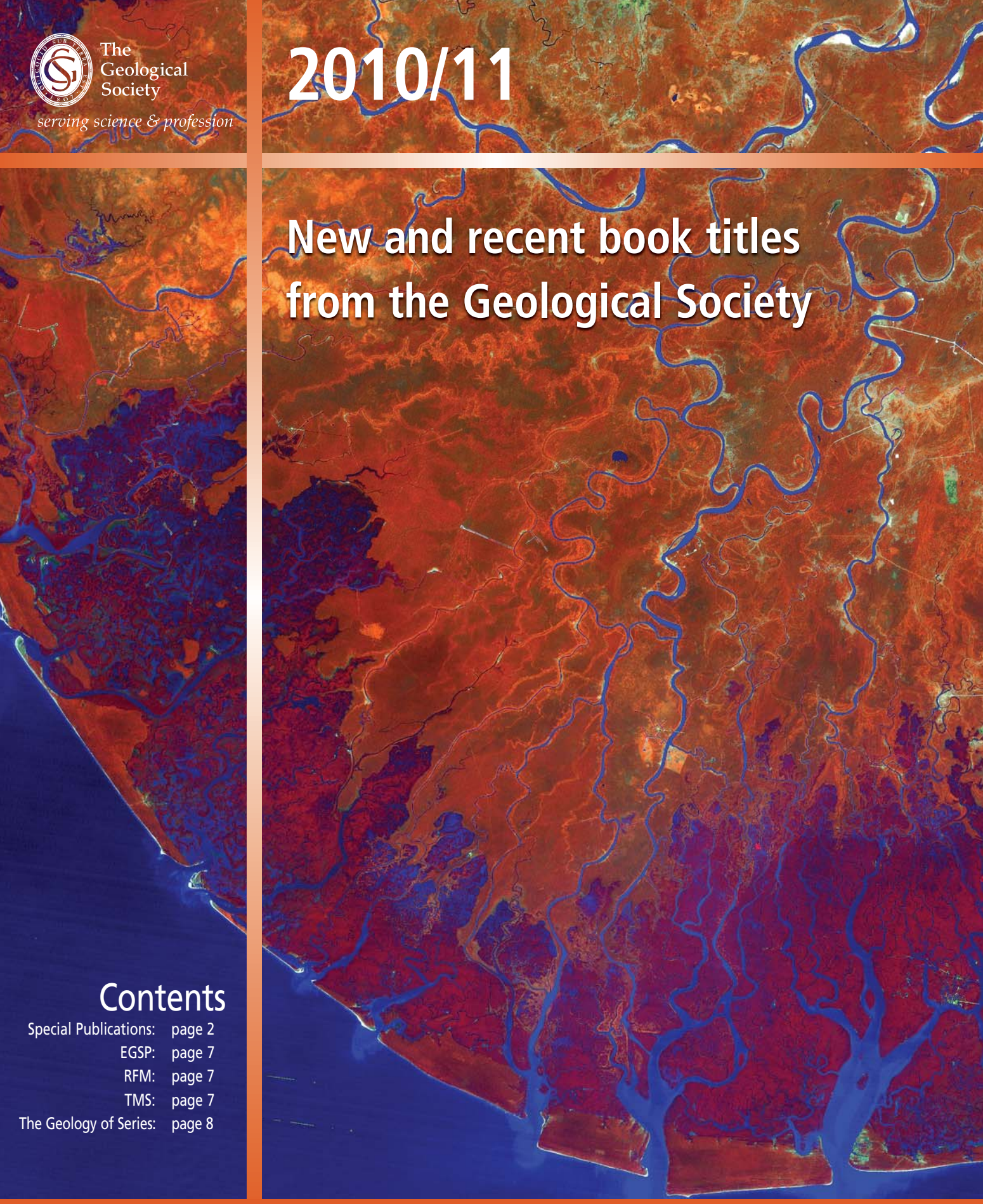

Contents

Special Publications: page 2
EGSP: page 7
RFM: page 7
TMS: page 7
The Geology of Series: page 8

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• Special Publication 336

Tufas and Speleothems: Unravelling the Microbial and Physical Controls

Edited by H. M. Pedley and M. Rogerson

Our understanding of calcium carbonate precipitation within freshwater carbonate systems is being revolutionized by new quantitative approaches at both field and laboratory scale. These systems cover a diverse range of topical research areas including tufas, speleothems, stromatolites and microbial processes. Progress by various international research groups has been impressive, with major contributions to such areas as climate change, absolute dating, carbon sequestration, and biofilm construction and precipitation. A diverse sample of interrelated research is presented that provides a tantalizing glimpse of the interplay between microbial, geochemical and physical processes that control the development of tufas and speleothems. This volume will provide a cross-disciplinary platform that will stimulate further exchanges about new concepts, methodologies and interpretations associated with freshwater carbonates. In particular, it will help reinforce the importance of cross-discipline research: the driving force behind the new field of Geobiology.

NEW

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• Special Publication 335

Continental Tectonics and Mountain Building: The Legacy of Peach and Horne

Edited by R. D. Law, R. W. H. Butler, R. E. Holdsworth, M. Krabbendam and R. A. Strachan

The world's mountain ranges are the clearest manifestations of long-term deformation of the continental crust. As such they have attracted geological investigations for centuries. Throughout this long history of research a few keynote publications stand out. One of the most important is the Geological Survey's 1907 Memoir on The Geological Structure of the North-West Highlands of Scotland. The Memoir summarized some of the Geological Survey's finest work, and outlined many of the principles of field-based structural and tectonic analysis that have subsequently guided generations of geologists working in other mountain belts, both ancient and modern. The thematic set of 32 papers in this Special Publication celebrate the 100th anniversary of the 1907 Memoir by placing the original findings in both historical and modern contexts, and juxtaposing them against present-day studies of deformation processes operating not only in the NW Highlands, but also in other mountain belts.

NEW

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• Special Publication 334

The Triassic Timescale

Edited by S. G. Lucas

The Mesozoic Era begins with the approximately 50-million-year-long Triassic Period, a major juncture in Earth history when the vast Pangaean supercontinent completed its assembly and began its fragmentation, and the global biota diversified and modernized after the end-Permian mass extinction, the most extensive biotic decimation of the Phanerozoic. The temporal ordering of geological and biotic events during Triassic time thus is critical to the interpretation of some unique and pivotal events in Earth history. This temporal ordering is mostly based on the Triassic timescale, which has been developed and refined for nearly two centuries. This book reviews the state of the art of the Triassic timescale and includes comprehensive analyses of Triassic radio-isotopic ages, magnetostratigraphy, isotope-based and cyclostratigraphic correlations and timescale -relevant marine and non-marine biostratigraphy.

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• Special Publication 333

Natural Stone Resources for Historical Monuments

Editors: R. Prikryl and Á. Török

Natural stone is considered to be a versatile, durable and aesthetically pleasing building material. From the beginning of civilization, important structures and monuments have been built from, or based on, natural stone. Until the end of the nineteenth century, the use of local stone resources was mostly in balance with the local environment. Strict environmental legislation has resulted in the closing of many long-standing quarries in industrialized countries, which has led to a shortage of traditional stone varieties. This has caused problems for restoration practice. Cheap, imported stone from less industrialized countries has become more widely available in recent years.

Some of the issues related to built stone conservation and restoration covered by this volume are: the establishment of inventories of possible replacement stones; understanding the decay mechanism and use of preventive conservation methods for slowing down decay processes; evaluation of the properties of natural stone; and assessing the risks of using replacement stones of different qualities.

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Advances in Interpretation of Geological Processes: Refinement of Multi-scale Data and Integration in Numerical Modelling

Edited by M. I. Spalla, A. M. Marotta and G. Gosso

Iterative comparison of analytical results and natural observations with predictions of numerical models improves interpretation of geological processes. Further refinements derive from wide-angle comparison of results from various scales of study. In this volume, advances from field, laboratory and modelling approaches to tectonic evolution - from the lithosphere to the rock scale - are compared. Constructive use is made of apparently discrepant or non-consistent results from analytical or methodological approaches in processing field or laboratory data, P–T estimates, absolute or relative age determinations of tectonic events, tectonic unit size in crustal-scale deformation, grain-scale deformation processes, various modelling approaches, and numerical techniques. Advances in geodynamic modelling critically depend on new insights into grain- and subgrain-scale deformation processes. Conversely, quantitative models help to identify which rheological laws and parameters exert the strongest control on multi-scale deformation up to lithosphere and upper mantle scale.

NEW

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• Special Publication 331

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Limestone in the Built Environment: Present-Day Challenges for the Preservation of the Past

Editors: B. J. Smith, M. Gomez-Heras, H. A. Viles and J. Cassar

Limestone is a highly successful and widely used building material, found in many important historic buildings and new monuments around the world. Whilst its success reflects its durability under a wide range of environmental conditions, there are still important questions surrounding the selection, use and conservation of building limestones. In order to make best use of new limestone today, and to conserve old limestone most effectively, we need to bring modern research methods to bear on understanding the characteristics of different limestones, what mortars to use, and how key limestones have responded to polluted atmospheres. This volume brings together recent inter-disciplinary research on these issues, illustrating the diversity of innovative techniques that are now being applied to furthering our understanding of building limestones.

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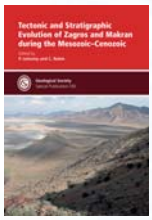

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Tectonic and Stratigraphic Evolution of Zagros and Makran during the Mesozoic–Cenozoic

Edited by P. Leturmy and C. Robin

The Zagros fold-thrust belt (ZFTB) extends from Turkey to the Hormuz Strait, resulting from the collision of the Arabian and Eurasian plates during Cenozoic times, and separates the Arabian platform from the large plateaux of central Iran. To the east a pronounced syntaxis marks the transition between the Zagros collision belt and the Makran accretionary wedge. In the ZFTB, the Proterozoic to Recent stratigraphic succession pile is involved in huge folds, and offers the opportunity to study the stratigraphic and tectonic evolution of the Palaeo-Tethyan margin.

Few recent data were widely available on the southern Tethys margin preserved in the Zagros Mountains. The Middle East Basins Evolution (MEBE) program was an excellent opportunity to go back to the field and to collect new data to better constrain the evolution of this margin. In this volume the structure of the Zagros Mountains is explored through different scales and using different methodologies.

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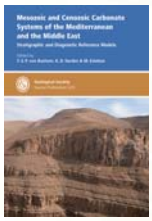

•ISBN: 978-1-86239-292-2
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• Special Publication 329

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Mesozoic and Cenozoic Carbonate Systems of the Mediterranean and the Middle East: Stratigraphic and Diagenetic Reference Models

Edited by F. S. P. van Buchem, K. D. Gerdes and M. Esteban

This volume contains a collection of stratigraphic and diagenetic case studies of Mesozoic and Cenozoic carbonate sequences from the Tethyan realm. High levels of industry and academic interest in the region have generated numerous multi-disciplinary studies of these sequences, a selection of which are presented in this volume. The studies presented are based on both comprehensive subsurface datasets from important hydrocarbon-bearing strata of the Middle East and the excellent surface exposures in the region of interest.

The studies presented in this volume may serve as suitable starting points in the development of age and architecture specific carbonate reference models. Such models can form the basis of internally consistent models for carbonate deposition, sequence development and reservoir performance. Ideally such models, suitably scaled, will be equally applicable to academic studies, the exploration and development phases of the field life cycle and in the prediction of future reservoir performance.

•ISBN: 978-1-86239-288-5
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• Special Publication 328

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The Origin and Evolution of the Caribbean Plate

Edited by K. H. James, M. A. Lorente and J. L. Pindell

This book discusses the current state of research on the geology of the area between North and South America, with a focus on the origin of the Caribbean Plate. Prevailing understanding is that the Caribbean Plate formed in the Pacific and migrated between the Americas. According to this model, the plate comprises oceanic and volcanic arc rocks. An alternative interpretation considers that the plate formed in place and includes extended continental crust. Hybrids of these ideas also exist. The papers in this volume provide regional overviews, discussions of the origins of the Caribbean Plate, and consider aspects of local geology arranged in a circum-Caribbean tour and ending in the plate interior. They address tectonics, igneous and metamorphic geology, stratigraphy and palaeontology. The objective of this wide variety of topics is to facilitate debate.

•ISBN: 978-1-86239-289-2
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Ancient Orogens and Modern Analogues

Edited by J. B. Murphy, J. D. Keppie and A. Hynes

Plate tectonics provide a unifying conceptual framework for the understanding of Phanerozoic orogens. More controversially, recent syntheses apply these principles as far back as the Early Archaean. Many ancient orogens are, however, poorly preserved and the processes responsible for them are not well understood. The effects of processes such as delamination, subduction of oceanic and aseismic ridges, overriding of plumes and subduction erosion are rarely identified in ancient orogens, although they have a profound effect on Cenozoic orogens. However, deeply eroded ancient orogens provide insights into the hidden roots of modern orogens. Recent advances in analytical techniques, as well as in fields such as geodynamics, have provided fresh insights into ancient orogenic belts, so that realistic modern analogies can now be applied. This Special Publication offers up-to-date reviews and models for some of the most important orogenic belts developed over the past 2.5 billion years of Earth history.

•ISBN: 978-1-86239-287-8
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• Special Publication 326

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Global Neoproterozoic Petroleum Systems: The Emerging Potential in North Africa

Edited by J. Craig, J. W. Thurow, B. Thusu, A. G. Whitham and Y. Abutarruma

Worldwide, Neoproterozoic successions are major hydrocarbon producers. In North Africa, large basins with significant surface outcrops and thick sedimentary fills are widespread. These basins are now emerging as potential sources of hydrocarbons and are attracting interest both from geological researchers and the oil and gas industry.

This volume focuses on recent developments in the understanding and correlation of North African basin fills and explores novel approaches to prospecting for source and reservoir rocks. The papers cover aspects of petroleum prospectivity and age-equivalent global petroleum systems, Neoproterozoic tectonics and palaeogeography, sequence stratigraphy, glacial events and global climatic models, faunal and floral evolution and the deposition of early source rocks.

The broader aim is to compare with, and learn from, well-studied Neoproterozoic successions globally, including major environmental change, the emergence of life, the global carbon cycle and implications for hydrocarbon exploration.

•ISBN: 978-1-86239-286-1
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• Special Publication 325

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Early Palaeozoic Peri-Gondwana Terranes: New Insights from Tectonics and Biogeography

Edited by M. G. Bassett

Following the late Neoproterozoic– early Cambrian breakup of the supercontinent Rodinia, Gondwana evolved as one of the principal continental masses on Earth, embracing most of South America, Africa, Australasia, Antarctica, much of western Europe and parts of Asia. Around its margins were various other terranes that had varying tectonic and biogeographical affinities with the main continental block. This book incorporates a series of reviews and multidisciplinary research papers that together explore the tectonic, palaeogeographical and palaeobiogeographical evolution of the elements that made up the peri-Gondwanan collage. The stratigraphical scope of the coverage embraces the late Precambrian through early Devonian, providing a comprehensive overview of structural, stratigraphical and biological evolution through this significant interval of Earth history. Integration of these various processes throughout the volume will be of broad-based interest to a wide range of geoscientists.

•ISBN: 978-1-86239-285-4
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Thermochronological Methods: From Palaeotemperature Constraints to Landscape Evolution Models

Edited by F. Lisker, B. Ventura and U. A. Glasmacher

Thermochronology - the use of temperature-sensitive radiometric dating methods to reconstruct the thermal histories of rocks - has proved to be an important means of constraining a wide variety of geological processes. Fission track and (U–Th)/He analyses of apatites, zircons and titanites are the best-established methods for reconstructing such histories over time scales of millions to hundreds of millions of years. The papers published in this volume are divided into two sections. The first section on 'New approaches in thermochronology', presents the most recent advances of existing thermochronological methods and demonstrates the progress in the development of alternative thermochronometers and modelling techniques. The second section, 'Applied thermochronology', comprises original papers about denudation, long-term landscape evolution and detrital sources from the European Alps, northwestern Spain, the Ardennes, the Bohemian Massif, Fennoscandia and Corsica. It also includes case studies from the Siberian Altai, Mozambique, South Africa and Dronning Maud Land (East Antarctica) and reports an ancient thermal anomaly within a regional fault in Japan.

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• Special Publication 323

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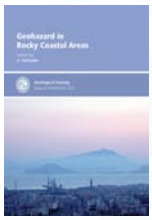
Palaeoproterozoic Supercontinents and Global Evolution

Edited by S. M. Reddy, R. Mazumder, D. A. D. Evans and A. S. Collins

The Palaeoproterozoic era (2500-1600 Ma) is a critical period of Earth history, with dynamic evolution from the deep planetary interior to its surface environment. Several lines of geological evidence suggest the existence of at least one pre-Rodinia supercontinent, named Nuna or Columbia, which formed near the end of Palaeoproterozoic time. Prior to this assembly, there may have been an older supercontinent (Kenorland) or perhaps only independently drifting supercratons. The tectonic records of amalgamation and dispersal of these ancient landmasses provide a framework that links processes of the deep Earth with those of its fluid envelope. The sixteen papers in this volume present reviews and new analytical data that span the geological record of Palaeoproterozoic Earth. The volume is useful as a reference book for students and professional geoscientists interested in this important period of global evolution.



•ISBN: 978-1-86239-282-3
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• Special Publication 322

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Geohazard in Rocky Coastal Areas

Edited by C. Violante

This Special Publication provides a range of methods and approaches for characterizing and modelling mass-wasting phenomena responsible for land degradation and erosion in rocky coastal areas. Rocky coasts occur in a variety of geological settings with a wide range of morphologies depending on rock type, tectonics and climate. In all these settings, slope instability represents the most important geological process that significantly influences the human use of coastal resources over a range of magnitudes and periods of recurrence.

The reported case studies in the volume deal with land-born geological processes that deliver sediment to the coast and open sea at intermittent time intervals, often with catastrophic implications. They include large slope failures on both volcanic and non-volcanic coastal areas, cliff recession and floods of coastal streams from key areas of the Italian peninsula. All these studies seek to establish sea–land correlations based on marine geophysical investigations and field analyses, and to highlight the role of documentary sources in order to recognize geological constraints for hazard assessment in rocky coastal areas.

•ISBN: 978-1-86239-284-7
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• Special Publication 321

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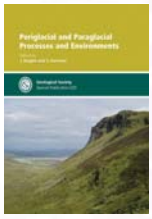
Extending a Continent: Architecture, Rheology and Heat Budget

Edited by U. Ring and B. S. Wernicke

Over the last three decades, there has been a growing appreciation of the role of extensional tectonics in convergent orogens. The opening contribution, by Brian Wernicke, provides a flavour of how this 'detachment era' has changed our views on tectonometamorphic relationships in mountain belts. It gives a historic view of how our ideas about large-scale tectonic contacts in mountain belts have changed over the years. Wernicke concludes that controversy still persists over the existence and mechanics of slip on shallowly dipping extensional detachments. However, incontrovertible field evidence shows that slip on shallowly dipping extensional faults occurs in nature. The other papers provide a mix of new, innovative and controversial ideas that may help to solve the mechanical paradox on slip on shallowly dipping extensional detachments and quantitative case studies from New Zealand, the Aegean extensional province, the Alps and Finland.



•ISBN: 978-1-86239-281-6
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• Special Publication 320

Periglacial and Paraglacial Processes and Environments

Edited by J. Knight and S. Harrison

Periglacial and paraglacial environments, located outside ice sheet margins but responding to similar climate forcings, are key to identifying climate change effects upon the Earth system. These environments are relicts of cold Earth processes and so are most sensitive to global warming. Changes in the distribution and thickness of permafrost in continental interiors have implications for ecosystem and landscape stability. Periglacial Alpine environments are experiencing increased rockfall and mass movement, leading to rock glacier instability and sediment release to downstream rivers. In turn, these landscape effects impact on natural hazards and human activities in these sensitive and geologically transient environments.

Papers in this volume explore some of these interrelated issues in field studies from Europe, North America and Asia. The volume will be of interest to geomorphologists, modellers, environmental managers, planners and engineers working on landscape, climate and environmental change in periglacial and paraglacial areas.

•ISBN: 978-1-86239-279-3
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• Special Publication 319

Sediment-Hosted Gas Hydrates: New Insights on Natural and Synthetic Systems

Edited by D. Long, M. A. Lovell, J. G. Rees and C. A. Rochelle

There is much interest in gas hydrates in relation to their potential role as a major energy source and as an important driver of climate change; however, many questions remain, not least the size of the global hydrate budget. Much of the current uncertainty centres on how hydrates are physically stored in sediments at a range of scales. This volume details advances in our understanding of sediment-hosted hydrates, and contains papers covering a range of studies of real and artificial sediments containing both methane hydrates and CO_2 hydrates. The papers include an examination of the techniques used to locate, sample and characterize hydrates from natural, methane-rich systems, so as to understand them better. Other contributions consider the nature and stability of synthetic hydrates formed in the laboratory, which in turn improve our ability to make accurate predictive models.

•ISBN: 978-1-86239-278-6
•July 2009
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•Price:
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• Special Publication 318

Earth Accretionary Systems in Space and Time

Edited by P. A. Cawood and A. Kröner

Accretionary orogens form at convergent plate boundaries and include the supra-subduction zone forearc, magmatic arc and backarc components. They can be broken into retreating and advancing types, based on their kinematic framework and resulting geological character.

Accretionary systems have been active throughout Earth history, extending back until at least 3.2 Ga, and provide an important constraint on the initiation of horizontal motion of lithospheric plates on Earth.

Accretionary orogens have been responsible for major growth of the continental lithosphere, through the addition of juvenile magmatic products, but are also major sites of consumption and reworking of continental crust through time.

The aim of this volume is to provide a better understanding of accretionary processes and their role in the formation and evolution of the continental crust. Fourteen papers deal with general aspects of accretion and metamorphism and discuss examples of accretionary orogens and crustal growth through Earth history, from the Archaean to the Cenozoic.

•ISBN: 978-1-86239-277-9
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•488 pages •Hardback
•Price:
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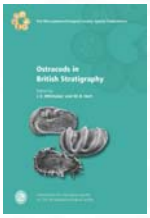
• Special Publication 317

The Making of the Geological Society of London

Edited by C. L. E. Lewis and S. J. Knell

Founded in 1807, the Geological Society of London became the world's first learned society devoted to the Earth sciences. In celebration of the Society's 200-year history, this book commemorates the lives of the Society's 13 founders and sets geology in its national and European context at the turn of the nineteenth century. In Britain, geology was emerging as a subject in its own right from three closely related disciplines — chemistry, mineralogy and medicine — disciplines that reflect the principal professions and interests of the founders. The tremendous energy and cooperation of these 13 men, about whom little was previously known, quickly mobilized like-minded men around the country and fuelled the nation's passion for geology; an enthusiasm that soon spread to America and Australia. Two previously unpublished works from this period, essential to understanding the founding of the Society, are reproduced here for the first time. The book closes with a review of the Society's 2007 Bicentenary celebrations.



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•June 2009
•496 pages •Hardback
•Price:
List: US$200.00

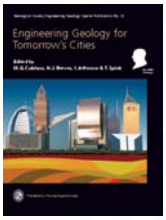
• TMS Special Publication

amazon.com. BARNES&NOBLE

Ostracods in British Stratigraphy

Edited by J. E. Whittaker and M. B. Hart

This book charts the stratigraphical distribution of ostracods in the Cambrian to Pleistocene deposits of Britain and outlines their utility for dating and correlating rock sequences, as well as indicating aspects of their palaeoenvironmental and palaeogeographical significance. These small bivalved crustaceans are the most abundant arthropods in the fossil record. Indeed, the stratigraphy of Britain, which embraces many type-sequences, provides a particularly rich and full record of them, from at least the basal Ordovician, and from the British Cambrian there is a biostratigraphy based on their 'relatives', the bradoriids and phosphatocopids. Ostracod distributions demonstrate the ecological success story of the group, occupying as they do marine, non-marine and even 'terrestrial' habitats. Written by current specialists in the field, this book is an authoritative account and will be welcomed by all micropalaeontologists and applied geologists in the industrial and academic world alike. It is richly illustrated with over 80 plates of electron micrographs and specially drawn maps, diagrams and range-charts.



•ISBN: 978-1-86239-290-8
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•328 pages •Hardback
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• Engineering Geology Special Publication 22

amazon.com. BARNES&NOBLE

Engineering Geology for Tomorrow's Cities

Editors: M. G. Culshaw, H. J. Reeves, I. Jefferson and T. Spink

This book and the accompanying DVD provide a statement of our knowledge and understanding of engineering geology as applied to the urban environment at the start of the 21st century. In particular, this volume demonstrates that:

- working standards originally developed nationally are becoming internationalized;
- risk assessment, rather than just assessment of hazards, is driving decision-making;
- geo-environmental change, whether climatically or anthropogenically driven, is becoming better understood;
- greater use of underground space is being made;
- the relentless advance of information technology is providing new opportunities for engineering geologists to interpret and visualize the subsurface.

This book shows that in developed and developing countries alike, engineering geologists are increasingly exchanging ideas and learning from each other in a genuine two-way process. These ideas will contribute significantly to the sustainable development of both new and long-established urban environments worldwide.

•ISBN: 978-1-86239-259-5
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•Price:
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• Rock-Forming Minerals Volume 3B

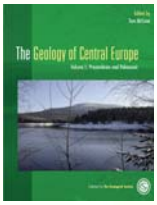
amazon.com. BARNES&NOBLE

Layered Silicates Excluding Micas and Clay Minerals (Second Edition)

Edited by W. A. Deer, R. A. Howie and J. Zussman

This extensive revision deals with the minerals talc, pyrophyllite, chlorite, serpentine, stilpnomelane, zussmanite, prehnite and apophyllite. The text has been completely rewritten and very much expanded to take account of the many advances that have been made in all aspects of the Earth sciences, not least mineralogy. Each chapter is headed by a brief tabulation of mineral data and ends with full references. Crystal structures are described and illustrated, followed by discussion of structural information gained from spectroscopic as well as X-ray and electron-optic methods. Chemical sections include many analyses and structural formulae, phase relations, igneous, metamorphic and sedimentary geochemistry, alteration and weathering. Examples are given of a range of mineral parageneses. Correlation between the various aspects of mineralogy are emphasized in order to provide a scientific understanding of minerals as well as their description and identification.

Rock-Forming Minerals is an essential reference work for professionals, researchers and postgraduate students in Earth science and related fields in chemistry, physics, engineering, environmental and soil sciences.



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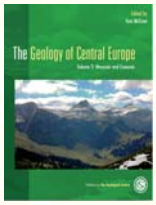

The Geology of Central Europe

Volume 1: Precambrian and Palaeozoic
Volume 2: Mesozoic and Cenozoic

Edited by T. McCann

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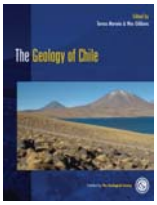
This two-volume set provides the first comprehensive account in English of the geology of Central Europe. Written by more than 200 scientists from universities and research centres spread across Europe and North America, the 21 chapters are based on the main stratigraphic periods. Individual chapters outline the evolution of the region, including overviews of the stratigraphic framework, climate, sea-level variations, palaeogeography and magmatic activity. These are followed by detailed descriptions of the Central European succession, covering the main basins and magmatic provinces. Each chapter is thoroughly referenced, providing a unique and valuable information source.

Volume 1 focuses on the evolution of Central Europe from the Precambrian to the Permian, a dynamic period which traces the formation of Central Europe from a series of microcontinents that separated from Gondwana through to the creation of Pangaea. Separate summary chapters on the Cadomian, Caledonian and Variscan orogenic events as well as on Palaeozoic magmatism provide an overview of the tectonic and magmatic evolution of the region. These descriptions sometimes extend beyond the borders of Central Europe to take in the Scottish and Irish Caledonides as well as the Palaeozoic successions in the Baltic region.

Volume 2 provides an overview of the Mesozoic and Cenozoic evolution of Central Europe. This period commenced with the destruction of Pangaea and ended with the formation of the Alps and Carpathians and the subsequent Ice Ages. Separate summary chapters on the Permian to Cretaceous tectonics and the Alpine evolution are also included. The final chapter provides an overview of the fossils fuels, ore and industrial minerals in the region.



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The Geology of Chile

Editors: T. Moreno and W. Gibbons

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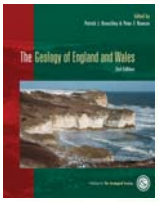
This book is the first comprehensive account in English of the geology of Chile, providing a key reference work that brings together many years of research, and written mostly by Chilean authors from various universities and other centres of research excellence. The 13 chapters begin with a general overview, followed by detailed accounts of Andean tectonostratigraphy and magmatism, the amazingly active volcanism, the world class ore deposits that have proven to be so critical to the welfare of the country, and Chilean water resources. The subject then turns to geophysics with an examination of neotectonics and earthquakes, the hazardous frequency of which is a daily fact of life for the Chilean population. There are chapters on the offshore geology and oceanography of the SE Pacific Ocean, subjects that continue to attract much research not least from those seeking to understand world climatic variations, and on late Quaternary land environments, concluding with an account examining human colonization of southernmost America.



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The Geology of England and Wales (2nd edition)

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Edited by P. J. Brenchley and P. F. Rawson

This second edition of *The Geology of England and Wales* is considerably expanded from its predecessor, reflecting the increase in our knowledge of the region, and particularly of the offshore areas. Forty specialists have contributed to 18 chapters, which are placed in approximately temporal order. The final chapter looks at the future, from the short-term effects of climate change and sea-level rise to the position of our region in a possible plate tectonic configuration 200 million years hence. While the authors have taken a 'dynamic' view of the evolution of the area over geological time, they have also ensured that the geological evidence on which the interpretations are based is reviewed thoroughly. Hence the volume provides an invaluable resource for both Earth scientists and the broader community.