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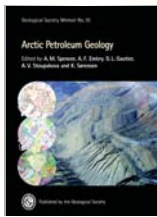
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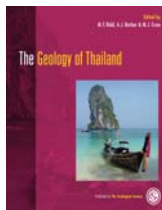
• **Memoir 35**

Arctic Petroleum Geology

Edited by A. M. Spencer, A. F. Embry, D. L. Gautier, A. V. Stoupakova and K. Sørensen

The vast Arctic region contains nine proven petroleum provinces with giant resources but over half of the sedimentary basins are completely undrilled, making the region the last major frontier for conventional oil and gas exploration. This book provides a comprehensive overview of the geology and the petroleum potential of the Arctic. Nine papers offer a circum-Arctic perspective on the Phanerozoic tectonic and palaeogeographic evolution, the currently recognized sedimentary basins, the gravity and magnetic fields and, perhaps most importantly, the petroleum resources and yet-to-find potential of the basins. The remaining 41 papers provide data-rich, geological and geophysical analyses and individual oil and gas assessments of specific basins throughout the Arctic. These detailed and well illustrated studies cover the continental areas of Laurentia, Baltica and Siberia and the Arctic Ocean. Of special interest are the 13 papers providing new data and interpretations on the extensive, little known, but promising, basins of Russia.

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The Geology of Thailand

Edited by M. F. Ridd, A. J. Barber and M. J. Crow

This is the first volume in the English language to cover the entire range of the geology of Thailand since the joint Thai-US account by Brown et al. exactly 60 years ago. Over this period there has been a phenomenal growth in interest in this core area of SE Asia. This has been led by geologists in Thailand, but with important and highly significant input from geologists based elsewhere in Asia and in Europe, Australasia and North America. Some of that research was prompted by commercial considerations, since Thailand has important energy and mineral resources, while other research has sought to understand better the stratigraphic and structural history, including the plate-tectonic story which Thailand's rocks reveal. This new volume seeks to bring together all of this knowledge into a single accessible book; it is the work of an international team drawn from Thailand, Japan, Australia, USA, Canada, Germany and the UK



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• **Special Publication 355**

The SE Asian Gateway: History and Tectonics of the Australia-Asia collision

Edited by R. Hall, M. Cottam and M. E. J. Wilson

Collision between Australia and SE Asia began in the Early Miocene and reduced the former wide ocean between them to a complex passage which connects the Pacific and Indian Oceans. Today, the Indonesian Throughflow passes through this gateway and plays an important role in global thermohaline flow, and the region around it contains the maximum global diversity for many marine and terrestrial organisms. Reconstruction of this geologically complex region is essential for understanding its role in oceanic and atmospheric circulation, climate impacts, and the origin of its biodiversity.

The papers in this volume discuss the Palaeozoic to Cenozoic geological background to Australia and SE Asia collision, and provide the background for accounts of the modern Indonesian Throughflow, oceanographic changes since the Neogene, and aspects of the region's climate history.

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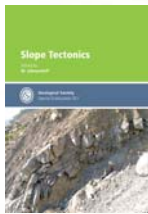
• **Special Publication 353**

Growth and Collapse of the Tibetan Plateau

Edited by R. Gloaguen and L. Ratschbacher

Despite agreement on first-order features and mechanisms, critical aspects of the origin and evolution of the Tibetan Plateau, such as the exact timing and nature of collision, the initiation of plateau uplift, and the evolution of its height and width, are disputed, untested or unknown. This book gathers papers dealing with the growth and collapse of the Tibetan Plateau. The timing, the underlying mechanisms, their interactions and the induced surface shaping, contributing to the Tibetan Plateau evolution are tightly linked via coupled and feedback processes. We therefore present cross-disciplinary contributions which allow insight into the complex interactions between lithospheric dynamics, topography building, erosion, hydrological processes and atmospheric coupling. The book is structured in four parts: early processes in the plateau formation; recent growth of the Tibetan Plateau; mechanisms of plateau growth; and plateau uplift, surface processes and the monsoon.

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• **Special Publication 351**

Slope Tectonics

Edited by M. Jaboyedoff

Usually geomorphology, structural geology and engineering geology provide descriptions of slope instability in quite distinctive ways. This new research is based on combined approaches to providing an integrated view of the operative slope processes. 'Slope Tectonics' is the term adopted here to refer to those deformations that are induced or fully controlled by the slope morphology, and that generate features which can be compared to those created by tectonic activity. Such deformation can be induced by the stress field in a slope which is mainly controlled by gravity, topography and the geological setting created by the geodynamic context.

The content of this book includes slope-deformation characterization using morphology and evolution, mechanical behaviour of the material, modes of failure and collapse, influence of lithology and structural features, and the role played by controlling factors. The contributions cover broad aspects of slope tectonics that attempt to underline a multidisciplinary approach, which should create a better framework for studies of slope instability.

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• **Special Publication 349**

Kinematic Evolution and Structural Styles of Fold-and-Thrust Belts

Edited by J. Poblet and R. J. Lisle

Fold-and-thrust belts occur worldwide, have formed in all eras of geological time, and are widely recognized as the most common mode in which the crust accommodates shortening. Much current research on the structure of fold-and-thrust belts is focused on structural studies of regions or individual structures and on the geometry and evolution of these regions employing kinematic, mechanical and experimental modelling. In keeping with the main trends of current research, this title is devoted to the kinematic evolution and structural styles of a number of fold-and-thrust belts formed from Palaeozoic to Recent times. The papers included in this book cover a broad range of different topics, from modelling approaches to predict internal deformation of single structures, 3D reconstructions to decipher the structural evolution of groups of structures, palaeomagnetic studies of portions of fold-and-thrust belts, geometrical and kinematic aspects of Coulomb thrust wedges and structural analyses of fold-and-thrust belts to unravel their sequence of deformations.



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• Special Publication 348

Hydrocarbons in Contractual Belts

Edited by G. P. Goffey, J. Craig, T. Needham and R. Scott

Onshore fold-thrust belts are commonly perceived as 'difficult' places to explore for hydrocarbons and are therefore often avoided. However, these belts host large oil and gas fields and so these barriers to effective exploration mean that substantial unexploited resources may remain. Over time, evaluation techniques have improved. It is possible in certain circumstances to achieve good 3D seismic data. Structural restoration techniques have moved into the 3D domain and increasingly sophisticated palaeo-thermal indicators allow better modelling of burial and uplift evolution of source and reservoirs. Awareness of the influence of pre-thrust structure and stratigraphy and of hybrid thick and thin-skinned deformation styles is augmenting the simplistic geometric models employed in earlier exploration. But progress is a slow, expensive and iterative process. Industry and academia need to collaborate in order to develop and continually improve the necessary understanding of subsurface geometries, reservoir and charge evolution and timing; this publication offers papers on specific techniques, outcrop and field case studies.

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• Special Publication 346

Australian Landscapes

Edited by P. Bishop and B. Pillans

Australian Landscapes provides an up-to-date statement on the geomorphology of Australia. Karst, desert, bedrock rivers, coasts, submarine geomorphology, biogeomorphology and tectonics are all covered, aided by the latest geochronological techniques and remote sensing approaches. The antiquity and enduring geomorphological stability of the Australian continent are emphasized in several chapters, but the cutting-edge techniques used to establish that stability also reveal much complexity, including areas of considerable recent tectonic activity and a wide range of rates of landscape change.

Links to the biological sphere are explored, in relation both to the lengthy human presence on the continent and to a biota that resulted from Cenozoic aridification of the continent, dated using new techniques. New syntheses of glaciation in Tasmania, aridification in South Australia and aeolian activity all focus on Quaternary landscape evolution.

This major synthesis of Australian geomorphology is dedicated to Professor John Chappell (The Australian National University) and Professor Martin Williams (University of Adelaide).

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• Special Publication 342

Monsoon Evolution and Tectonic-Climatic Linkage in Asia

Edited by P. D. Clift, R. Tada and H. Zheng

The Earth's climate varies through geological time as a result of external, orbital processes, as well as the positions of continents, growth of mountains and the opening and closure of oceanic gateways. Climate modelling suggests that the intensity of the Asian monsoon should correlate, at least in part, with the uplift history of the Tibetan Plateau and the Himalaya, as well as the evolution of gateways and the retreat of shallow seas in Central Asia. Long-term reconstructions of both mountain building and monsoon activity are key to testing the proposed links. This collection of papers presents a series of new studies documenting the variations of the Asian monsoon on orbital and tectonic timescales, together with the impact this has had on environmental conditions. The issue of which proxies are best suited to measuring monsoons is addressed, as is the effect that the monsoon has had on erosion and the formation of the stratigraphic record both on and offshore.

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Evolution of the Levant Margin and Western Arabia Platform since the Mesozoic

Edited by C. Homberg and M. Bachmann

This volume combines original data in various fields from the offshore Levant Basin and adjacent continental slopes and platforms. The first group of papers document the tectonic structures and sedimentological patterns associated with the development of the Levant Basin. They identify the successive rifting events from the Late Palaeozoic to the Early Cretaceous, followed by a moderate tectonic activity. The contribution of external factors like global sea-level and climate changes to the sedimentation processes during the Mid-Cretaceous is discussed in the second set of papers. The final group presents new kinematics and age constraints on the Late Cretaceous to Neogene tectonic phases and discusses the relationship of the structures with the closure of the Neo-Tethys and separation of the Arabia plate. This collection of research papers demonstrates new concepts on the opening and crustal thinning of the Levant Basin and gives updated interpretations of the latter tectonic structures of the Levant.



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• **Special Publication 340**

Sedimentary Basin Tectonics from the Black Sea and Caucasus to the Arabian Platform

Edited by M. Sosson, N. Kaymakci, R. A. Stephenson, F. Bergerat and V. Starostenk

This wide area of the Alpine–Himalayan belt evolved through a series of tectonic events related to the opening and closure of the Tethys Ocean. In doing so it produced the largest mountain belt of the world, which extends from the Atlantic to the Pacific oceans. The basins associated with this belt contain invaluable information related to mountain building processes and are the locus of rich hydrocarbon accumulations. However, knowledge about the geological evolution of the region is limited compared to what they offer. This has been mainly due to the difficulty and inaccessibility of cross-country studies. This Special Publication is dedicated to the part of the Alpine–Himalayan belt running from Bulgaria to Armenia, and from Ukraine to the Arabian Platform. It includes twenty multidisciplinary studies covering topics in structural geology/tectonics; geophysics; geochemistry; palaeontology; petrography; sedimentology; stratigraphy; and subsidence and lithospheric modelling. This volume reports results obtained during the MEBE (Middle East Basin Evolution) Programme and related projects in the circum Black Sea and peri-Arabian regions.

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• ISBN: 978-1-86239-303-5
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• **Special Publication 338**

The Evolving Continents: Understanding the Processes of Continental Growth

Edited by T. M. Kusky, M.-G. Zhai and W. Xiao

This volume honours the career of Brian F. Windley, who has been hugely influential in helping to achieve our current understanding of the evolution of the continental crust, and who has inspired many students and scientists to pursue studies on the evolution of the continents. Brian has studied processes of continental formation and evolution on most continents and of all ages, and has educated and inspired two generations of geologists to undertake careers in studies of continental evolution. The volume is organized into six sections, including: oceanic and island arc systems and continental growth; tectonics of accretionary orogens and continental growth; growth and stabilization of continental crust; collisions and intraplate processes; Precambrian tectonics and the birth of continents; and active tectonics and geomorphology of continental collision and growth zones.

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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.

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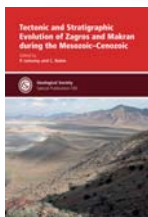
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Advances in Interpretation of Geological Processes: Refinement of Multi-scale Data and Integration in Numerical Modelling

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.



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• Special Publication 330

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 syntax 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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• Special Publication 328

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.



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• Special Publication 327

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

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

Edited by M. G. Bassett

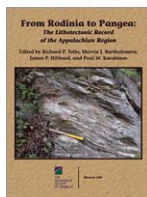
Following the late Neoproterozoic–early Cambrian breakup of the supercontinent Rodinia, Gondwana evolved as one of the principal continental masses on Earth, embracing most of South America, Africa, Australasia, Antarctica, much of western Europe and parts of Asia. Around its margins were various other 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.



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From Rodinia to Pangea: The Lithotectonic Record of the Appalachian Region

Edited by R. P. Tollo, M. J. Bartholomew, J. P. Hibbard, and P. M. Karabinos

The Appalachians constitute one of Earth's major tectonic features and have served as a springboard for innovative geologic thought for more than 170 years. This volume contains 36 original papers reporting the results of research performed throughout nearly the entire length and breadth of the Appalachian region, including all major provinces and geographical areas. Memoir 206 was designed to commemorate the (near-)fortieth anniversary of the publication of the classic Studies of Appalachian Geology volumes that appeared just prior to the application of plate tectonic concepts to the region. Contributions concerning structural evolution, sedimentation, stratigraphy, magmatic processes, metamorphism, tectonics, and terrane accretion illustrate the wide range of ongoing research in the area and collectively serve to mark the considerable progress in scientific thought that has occurred during the past four decades.

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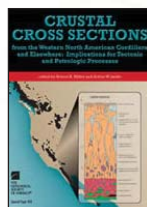


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Geology and Tectonic Evolution of the Central-Southern Apennines, Italy

Edited by L. Vezzani, A. Festa, and F. C. Ghisetti

This richly illustrated book, with its accompanying CD-ROM of full-color geological maps (scale 1:250,000) and stratigraphic-structural documentation, provides a comprehensive review of the geology and tectonics of the central-southern Apennines, one of the classical fold-and-thrust belts of the Alpine orogeny. It is a useful and up-to-date reference for researchers, teachers, and explorationists and can be used to plan either real or virtual field trips to some of the most beautiful mountain areas of Italy.

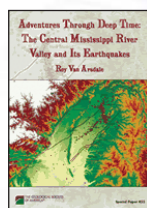


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Crustal Cross Sections from the Western North American Cordillera and Elsewhere: Implications for Tectonic and Petrologic Processes

Edited by R. B. Miller and A. W. Snoke

Exposed crustal cross sections provide a unique direct view of continental crust, and are a major source of insights into variations in lithologic and geochemical composition, structural style, metamorphism, plutonism, and rheology with progressive depth through the crust. This volume provides a synthesis of crustal cross sections with a special emphasis on Phanerozoic sections from the western North American Cordillera, supplemented by articles on lower- and mid-crustal sections through Proterozoic crust in North America and Australia, and the classic crustal section of Fiordland, New Zealand. Many of the papers describe multidisciplinary research on crustal sections and include data from various combinations of structural analysis, geochemistry, geothermobarometry, geochronology, geophysics, and other disciplines. The volume also discusses common problems for the interpretation of crustal cross sections, including how sections that expose deep-crustal rocks are eventually exhumed, and leading to the conclusion that there is no simple "standard model" for continental crust. This volume will be useful to those interested in structural geology, tectonics, geodynamics, regional geology, petrology, geochemistry/isotope geology, and geophysics.



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Adventures Through Deep Time: The Central Mississippi River Valley and Its Earthquakes

Edited by R. Van Arsdale

This volume presents the geologic history of the central Mississippi River Valley and the surrounding area from the Precambrian through the Holocene. Its focal point is the New Madrid seismic zone that both threatens and intrigues us. The book begins with a brief presentation of the geologic history of the southeastern United States, and subsequent chapters expand upon particular periods of time, discussing the most important regional geologic events and how those events affected the central Mississippi River Valley. The concluding chapters discuss the geology and seismology of the New Madrid seismic zone. This work is written to engage a wide range of geologists, from beginners to those who are thinking of conducting research in the Mississippi River Valley. The author's casual writing style makes the book a pleasure to read while also updating readers on the geology of the Mississippi Valley and its earthquakes.