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Special Publication 445
Tectonics of the Deccan Large Igneous Province
Edited by S. Mukherjee, A. A. Misra, G. Calvès and M. Nemčok

The petrology of the Deccan large igneous province has been well studied over the years, but the related tectonics less so. The papers in this volume present new research that will be of interest to anyone working in this region. Research on the tectonics of the Deccan traps is expected to yield societal benefits.

Memoir 48
Myanmar: Geology, Resources and Tectonics
Edited by A.J. Barber, Khin Zaw and M.J. Crow

Myanmar is a country vastly rich in gold, silver, base metals, tin–tungsten, gems and hydrocarbons and is one of the last exploration frontiers remaining in the world. Tectonically Myanmar lies at the eastern end of the Himalayan Mountain Chain and over the last 50 Ma has been profoundly affected by the collision between India and Eurasia, which is still ongoing, with frequent destructive earthquakes. Recent advances have been made in understanding the results of the collision, through the study of geochronology, seismicity, stratigraphy and structure. The development of a systematic mapping programme has been restricted by problems of access, due to limited infrastructure and armed insurgencies, meaning that large areas of the country have not been explored adequately. Recent political changes and reforms, with reconciliations with various ethnic groups, however, will permit access to large areas in Kayin, Kayah, Shan and Kachin States, enabling further research and exploration in new crustal blocks and terranes.

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Special Publication 439
The Geometry and Growth of Normal Faults
Edited by C. Childs, R.E. Holdsworth, C.A.-L. Jackson, T. Manzocchi, J.J. Walsh and G. Yielding

Normal faults are the primary structures that accommodate extension of the brittle crust. This volume provides an up-to-date overview of current research into the geometry and growth of normal faults. The 23 research papers present the findings of outcrop and subsurface studies of the geometrical evolution of faults from a number of basins worldwide, complemented by analogue and numerical modelling studies of fundamental aspects of fault kinematics. The topics addressed include how fault length changes with displacement, how faults interact with one another, the controls of previous structure on fault evolution and the nature and origin of fault-related folding.

This volume will be of interest to those wishing to develop a better understanding of the structural geological aspects of faulting, from postgraduate students to those working in industry.

Special Publication 447
The NE Atlantic Region: A Reappraisal of Crustal Structure, Tectonostratigraphy and Magmatic Evolution
Edited by G. Péron-Pinvidic, J.R. Hopper, M.S. Stoker, C. Gaina, J.C. Doornenbal, T. Funck and U.E. Árting

The NAG-TEC project was a collaborative effort by the British Geological Survey, the Geological Survey of Denmark and Greenland, the Geological Survey of Ireland, the Geological Survey of the Netherlands, the Geological Survey of Northern Ireland, the Geological Survey of Norway, Iceland GeoSurvey and the Faroese Geological Survey (Jarðfeingi), along with a number of academic partners and significant support from industry. The main focus was to investigate the tectonic evolution of the region with a particular emphasis on basin evolution along conjugate margins. A key outcome was the development of a new tectonostratigraphic atlas and database that includes comprehensive geological and geophysical information relevant for understanding the Devonian to present evolution of the NE Atlantic margins. These provide the foundation upon which ongoing research and exploration of the area can build.
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Special Publication 441
Geohazards in Indonesia: Earth Science for Disaster Risk Reduction
Edited by P.R. Cummins and I. Meilano

With dense urban populations located in one of the most active tectonic belts in the world, Indonesia is a hotspot for natural hazard risk. During the twentieth century, Indonesia had limited means to keep natural disaster fatalities from rising commensurately with the explosive growth in population. This situation is changing rapidly, however, with major political and economic advances over the past two decades having led to substantial investments in seismic and geodetic infrastructure. The potential for advances in earth science to reduce natural disaster fatalities in Indonesia has never been greater.

This Special Publication documents some of the recent advances made by Earth scientists that contribute towards a better understanding of geological hazards in Indonesia.

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Special Publication 457
Crustal Evolution of India and Antarctica: The Supercontinent Connection
Edited by N.C. Pant and S. Dasgupta

The Proterozoic aeon involved at least three major continental re-adjustments. India and Antarctica appear in most models of supercontinent reconstructions, but their relative position has been the subject of debate. High-resolution petrological and geochronological data, especially from the Proterozoic mobile belts, provide the principal means of resolving this issue. The ice-covered nature of Antarctica allows only limited access to the rocks, and then only in coastal tracts, so detailed studies in more accessible Proterozoic terrains in India assume added significance.

This volume, a follow-up to the XII International Symposium on Antarctic Earth Science, Goa (a SCAR symposium), provides new data from selected locations in east Antarctica (Enderby Land and Dronning Maud Land) and from India, including the Eastern Ghats Mobile Belt (EGMB), Chota Nagpur Gneissic Complex, the Khasi Hills and the Aravalli–Delhi Mobile Belt.

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The geological evolution of Central Asia commenced with the formation of a complex Precambrian–Palaeozoic orogen. Cimmerian blocks were then accreted to the southern margin in the Mesozoic, leading to tectonic reactivation of older structures and discrete episodes of basin formation. The Indian and Arabian blocks collided with Asia in the Cenozoic, leading to renewed structural reactivation, intracontinental deformation and basin development. This complex evolution resulted in the present-day setting of an elongated Tien Shan range flanked by large Mesozoic–Cenozoic sedimentary basins with smaller intramontane basins distributed within the range.

This volume presents multidisciplinary results and reviews from research groups in Europe and Central Asia that focus on the western part of the Tien Shan and some of the adjacent large sedimentary basins.
Volcanoes sometimes host a lake at the Earth’s surface. These lakes are the surface expressions of a reservoir, often termed a hydrothermal system, in highly fractured, permeable and porous media where fluids circulate. They can become monitoring targets since they integrate the heat flux discharged by an underlying magma body and condense some volcanic gases. Since they trap volcanic heat and gases, they are excellent tools to provide additional information about the status of a volcano and volcanic lake-related hazards.

This Special Publication comes at an exciting time for the volcanic lake community. It brings together scientific papers, which include studies of their structure, hydrogeological modelling, long-term multi-disciplinary monitoring efforts, as well as a number of innovative methods of sampling, data acquisition and in situ and laboratory experiments. Several papers challenge long-established paradigms and introduce new concepts and terminologies.

Understanding the Deccan Trap Large Igneous Province in western India is important for deciphering the India–Seychelles rifting mechanism. This book presents 13 studies that address the development of this province from diverse perspectives including field structural geology, geochemistry, analytical modelling, geomorphology and geophysics (e.g., palaeomagnetism, gravity and magnetic anomalies, and seismic imaging). Together, these papers indicate that the tectonics of Deccan is much more complicated than previously thought. Key findings include: the Deccan province can be divided into several blocks; the existence of a rift-induced palaeo-slope; constraints on the eruption period; rift–drift transition mechanisms determined for magma-rich systems; the tectonic role of the Deccan or Réunion plumes; sub-surface structures reported from boreholes; the delineation of the crust–mantle structure; the documentation of sub-surface tectonic boundaries; post-Deccan-Trap basin inversion; deformed dykes around Mumbai, and also from the eastern part of the Deccan Traps, documented in the field.
Memoir 47
The Andaman–Nicobar Accretionary Ridge: Geology, Tectonics and Hazards
Edited by P.C. Bandopadhyay and A. Carter

Rocks exposed across the hundreds of islands that belong to the 800 km long Andaman-Nicobar archipelago provide a condensed window into the active subduction zone that separates the India–Australia plate from the over-riding Burma–Sunda plate. Despite a strategic and seismically active location the Andaman-Nicobar ridge has seen comparatively little research. This Memoir provides the first detailed and comprehensive account of geological mapping and research across the island chain and adjacent ocean basins. Chapters examine models of Cenozoic rifting of the Andaman Sea and the regional tectonic and seismogenic framework. A detailed critical review of the Andaman–Nicobar stratigraphy, supported by new data, includes arc volcanism and a description of Barren Island, India’s only active volcano. Seismic history and hazards and the impacts of the 2004 earthquake and tsunami are also described. The volume ends with an examination of the region’s natural resources and hydrocarbon prospects.

Special Publication 449
Crust–Mantle Interactions and Granitoid Diversification: Insights from Archaean Cratons
Edited by J. Halla, M.J. Whitehouse, T. Ahmad and Z. Bagai

This Special Publication sheds light on crust formation and tectonic processes in early Earth by focusing on Archaean granitoids and related rocks from West Greenland in the North Atlantic Craton, Karelia Province of the Fennoscandian Shield, Eastern Dharwar and Bundelkhand cratons in the Indian Shield and Bug Complex of the Ukrainian Shield. Resulting from the IGCP-SIDA 599 project ‘The Changing Early Earth’, this compilation of papers provides explanations on the nomenclature of Archaean granitoids and explores the petrology, element and isotope geochemistry, geochronology and metamorphism of granitoids and supracrustal rocks of variable metamorphic grade. This volume provides information on the increase and timing of crust–mantle interactions and granitoid diversification from early Archaean protoliths of island arc origin to the emergence of multi-source high-K calc-alkaline granitoid batholiths at convergent continental margins. The formation of abundant granitoid batholiths suggests a significant change in mantle dynamics and plate tectonics towards the end of the Archaean.
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**Special Publication 432**
**Seismicity, Fault Rupture and Earthquake Hazards in Slowly Deforming Regions**
*Edited by A. Landgraf, S. Kuebler, E. Hintersberger and S. Stein*

Palaeoseismic records and seismological data from continental interiors increasingly show that these areas of slow strain accumulation are more subject to seismic and associated natural hazards than previously thought. Moreover, some of our instincts developed for assessing hazards at plate boundaries might not apply here. Hence assessing hazards and drawing implications for the future is challenging, and how well it can be done heavily depends on the ability to assess the spatiotemporal distribution of past large earthquakes. This book explores some key issues in understanding hazards in slowly deforming areas. Examples include classic intraplate regions, such as Central and Northern Europe, Mongolia, Inner Mongolia, Australia, and North and South America, and regions of widely distributed strain, such as the Tien Shan Mountains in Central Asia. The papers in this volume are grouped into two sections.

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**Special Publication 454**
**Geomechanical and Petrophysical Properties of Mudrocks**
*Edited by E.H. Rutter, J. Mecklenburgh and K.G. Taylor*

A surge of interest in the geomechanical and petrophysical properties of mudrocks (shales) has taken place in recent years following the development of a shale gas industry in the United States and elsewhere, and with the prospect of similar developments in the UK. Also, these rocks are of particular importance in excavation and construction geotechnics and other rock engineering applications, such as underground natural gas storage, carbon dioxide disposal and radioactive waste storage. They may greatly influence the stability of natural and engineered slopes. Mudrocks, which make up almost three-quarters of all the sedimentary rocks on Earth, therefore impact on many areas of applied geoscience.

This volume focuses on the mechanical behaviour and various physical properties of mudrocks. The 15 chapters are grouped into three themes: (i) physical properties such as porosity, permeability, fluid flow through cracks, strength and geotechnical behaviour; (ii) mineralogy and microstructure, which control geomechanical behaviour; and (iii) fracture, both in laboratory studies and in the field.

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368 pages  Hardback  
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The fossil history of animal life in India is central to our understanding of the tectonic evolution of Gondwana, dispersal of India, its northward journey, and its collision with Asia. This book provides the only detailed overview of the paleobiogeographic, tectonic, and paleoclimatic evolution of the Indian plate from Gondwana to Asia.

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Indian Plate and Its Epic Voyage from Gondwana to Asia
Edited by Sankar Chatterjee, Christopher R. Scotese, and Sunil Bajpai

This 10-chapter volume encompasses contributions from a wide spectrum of Earth science disciplines, including geophysics, geodynamics, geochemistry, and petrology, to provide an overview of the nature and evolution of the crust-mantle and lithosphere-asthenosphere boundaries in different tectonic settings.

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The Crust-Mantle and Lithosphere-Asthenosphere Boundaries: Insights from Xenoliths, Orogenic Deep Sections, and Geophysical Studies
Edited by Gianluca Bianchini, Jean-Louis Bodinier, Roberto Braga and Marjorie Wilson

Since the beginning of the last century, the lower Jurassic to mid-Miocene pelagic succession exposed along the valleys of the Umbria and Marche Apennines of Italy represented a fertile playground for generations of earth scientists. This GSA Special Paper provides a reappraisal of the geological and integrated stratigraphic research, which was carried out by scores of earth scientists.

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The Stratigraphic Record of Gubbio: Integrated Stratigraphy of the Late Cretaceous–Paleogene Umbria-Marche Pelagic Basin
Edited by Marco Menichetti, Rodolfo Coccioni, and Alessandro Montanari

The Abyss of Time: A study in geological time and Earth history
by Paul Lyle

Geologists are among that group of scientists who must factor the passage of time into their investigations and they thus have a perspective on time that sets them apart from many other researchers. The proposition that geological time is vast, encompassing thousands of millions of years, is relatively recent. It is a concept that remains controversial and unacceptable to many people today who still consider the Earth to have been made to a timetable covering no more than ten thousand years.

Paul Lyle examines how our fascination with time has developed from our earliest ancestors’ recognition of the cycles of the sun and the moon. It considers the passage of time as a series of non-repeatable events, Time’s Arrow, in contrast to time as a series of repeated processes, Time’s Cycle, both of which can be used to explain geological features on the Earth’s surface.

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Geology of the South Devon Coast: from the Dorset county boundary to the Brixham area
Edited by John C.W. Cope

This area presents an ideal introduction to fieldwork for students of geology. There is a wide range of geological features that are superbly displayed in rocks varying in age from Devonian through to Palaeogene, together with often spectacular structures and a wide range of sedimentary rock types. There is also a good variety of igneous rocks in the area. The Guide covers the coast between Brixham in the west to the county boundary with Dorset, encompassed by the English Riviera Geopark and the western end of the World Heritage coastline. Some inland areas around Dartmoor are also described.

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The Society has 23 Specialist Groups and Joint Associations, catering for most aspects of modern Earth science. Members of the Society are free to join as many such groups as they wish. Some groups, including all the Joint Associations, are not restricted to Society members.

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