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Geology, Resources and Tectonic Evolution

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**Sumatra:
Geology, Resources and Tectonic Evolution**

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Preface

The initiative for this Memoir arose from a series of field-based geological studies in Sumatra by the Institute of Geological Sciences (later the British Geological Survey) and the University of London Group for Geological Research in Southeast Asia in collaboration with the Indonesian Ministry of Mines, through the Geological Research and Development Centre and the Directorate of Mineral Resources in Bandung, and the Research and Development Centre for Oil and Gas Technology (LEMIGAS) in Jakarta between 1975 and 1995. The Indonesian side selected Sumatra as a suitable area for this programme of scientific and technical assistance in geological, geochemical and geophysical surveys, inventories of mineral potential and the training of geoscientists in pursuance of successive five-year development plans (Pelita). The work culminated in the publication by the Geological Research and Development Centre of a series of 42 1:250 000 Geological Map Sheets with Explanatory Notes covering the whole of Sumatra. In compiling these geological maps the work of the Dutch geologists of the Netherlands Indies Geological Survey, who commenced a systematic programme of mapping in Sumatra before the Second World War, and the work of geologists working for oil companies with concessions in Sumatra, supported by the Indonesian National Oil Company (Pertamina), and published since 1971 in the Proceedings of the Indonesian Petroleum Association, were also incorporated.

Map compilation, follow-up geological studies and the continuing activity of oil company and academic geologists resulted in the accumulation of a vast amount of geological information which is scattered in diverse sources and has never been properly synthesized. A group of geologists from the BGS and the University of London, together with other collaborating scientists, agreed to synthesise and review our current knowledge of all aspects of the geology of Sumatra in the present Memoir to form the foundation on which future geological work in Sumatra may be soundly based.

Credit is due to the foresight of Directors of the Indonesian Ministry of Mines (Dr John A. Katili, Director General of Geology and Mining), the Indonesian Geological Survey (Ir Johannes, Ir Salman Padmanagara), Geological Research and Development Centre (Dr H.M.S Hartono, Dr Rab Sukanto, Dr Mohamed Untung and Dr Irwan Bahar) the Directorate of Mineral Resources (Ir Salman Padmanagara, Ir Kingking A. Margawidjaja), and the Director (Dr Rachman Subroto) and Chief Geologist (Dr Bona Situmorang) of LEMIGAS, who initiated and provided administrative and logistic support for these various geological programmes and saw them through to successful conclusions. Credit is also due to the many Indonesian geologists from these various organizations who worked on the geological mapping, geophysical and mineral exploration programmes in Sumatra and acting as counterparts to BGS and University of London geologists in gathering the basic data and ensuring, frequently in challenging conditions, that expeditions in Sumatra were brought to successful and safe conclusions.

On the British side, the contribution of geologists of the Institute of Geological Sciences/British Geological Survey and the provision of equipment and of scholarships was supported by the Overseas Development Administration (ODA), and later the Department of International Development, as part of a technical aid programme to Indonesia by the British Government. The technical programme was initiated by Assistant Director (IGS) Dr David Bleackley CMG, and supervised successively by Regional Geologists Dr John V. Hepworth, Dr Clive Jones OBE, Dr John Bennett and Robert Evans. The North Sumatra Project (1975–1980) was managed in Bandung by Dr Barry Page, the North Sumatra Support Project by Dr Martin Clarke, the North Sumatra Mineral Exploration Project (1984–1988) by Frank Coulson, and the Southern Sumatra Geological and Mineral Exploration Project (1988–1994), by Dr Michael Crow. Sandy Macfarlane OBE managed the North Sumatra Basin Project (1985–1990) and follow-up projects (1990–1995) at LEMIGAS in Jakarta.

The University of London Group, directed by Dr A. J. Barber, became involved in Sumatra at the invitation of Dr John Hepworth (BGS) to provide training and qualifications to GRDC geologists and geophysicists who were taking part in the field mapping programmes, in return for administrative and logistical support for PhD research students and post-doctoral research assistants from the University of London. A similar arrangement was subsequently made with LEMIGAS. Financial support for British research students was provided by the Natural Environment Research Council and by a Consortium of oil companies who supported the work of the University of London Group throughout SE Asia. Indonesian geologists from GRDC, DMR and LEMIGAS studying in Britain were supported by the Overseas Development Administration, through the British Council, and by the University of London Consortium. The contributions of the many geologists both Indonesian and British who worked on projects in Sumatra under these collaborative arrangements is acknowledged in the list of references which accompanies this Memoir.

The editors are indebted to Mike Atherton, Paul Burton, Nick Cameron, Chuck Caughey, Martin Clarke, John Clure, Valerie Clure, John Cobbing, Chris Elders, Derek Fairhead, Massimo Gasparon, Robert Hall, Clive Jones, David Land, Bill McCourt, Greg Moore, Tim Moore, Andrew Samuel and Steve Sparks for their reviews of chapters, or parts of chapters, in this Memoir. Some generously reviewed more than one chapter. Their expertise has resulted in the correction of errors and misunderstandings and the overall improvement of the presentation of the contributions included in the Memoir.

The authors of the chapter on mineral resources are grateful for the provision of unpublished data by Terry Middleton, Rod Jones, Brian Levet and Greg Hartshorn. Discussions over many years with Andi Mangga, Mike Andrews, Nick Cameron, John Cobbing, Thamrin Cobrie, Suudi Gafoer, Agus Ganowan, Hariwidjaja, Linda Heesterman, Umi Kuntjara, Chris Johnson, Machali, Bill McCourt, Sumartono and Bob Young concerning the geology and mineral deposits of Sumatra have been invaluable in the preparation of this chapter.

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Simon Suggate of the South East Asia Research Group compiled the DEM image of Sumatra used on the cover of the volume.

A. J. Barber
M. J. Crow
J. S. Milsom
November 2004

Dedication

This Memoir is dedicated to all Earth Scientists who have contributed to our knowledge and understanding of the geology of Sumatra

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