The Rise and Fall of the Ediacaran Biota

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The Rise and Fall of the Ediacaran Biota

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Preface

The Proterozoic and early Phanerozoic, especially the time from Neoproterozoic to Early Palaeozoic, was punctuated by a series of significant events in Earth history. Glaciations of global scale wracked the Earth and interfingered with dramatic changes in the chemistry of oceans and atmosphere, marked shifts in continental configuration. It was during these dynamic and 'weedy' times that metazoans first appeared and increased in diversity, culminating in the appearance of a variety of hard tissue skeletons and deep 'farming' of the marine substrate, which marked the end of the Proterozoic and the first few millions of years of the Phanerozoic.

UNESCO International Geological Correlation Project 493 has been concerned with the precise timing of such Neoproterozoic events, teasing out the effects which these changing environments, climates, global chemistry and palaeogeography had on the development and diversification of animals, culminating in the spectacular Ediacaran/Vendian faunas of the late Precambrian, best represented along the Winter Coast of the White Sea in Russia, the Flinders Ranges of South Australia, the deserts of southern Namibia and the coastal outcrops of Newfoundland.

This project has aimed, from the beginning, to locate and document additional material from areas with a sparse Ediacaran biotic record (South America in particular), which though rare, have marked palaeobiogeographic and evolutionary interest. IGCP493 has also hosted studies that closely compared settings of these Ediacaran metazoans (using sedimentology, carbon and oxygen isotope signatures, palaeogeographic positioning). And, as part of this, IGCP493 has attempted to bring together in field and laboratory, as well as in targeted symposia, researchers with diverse backgrounds to work together in attempting to understand the physical settings in which biological events took place.

Two symposia are of importance for IGCP493, one in Prato, Italy in 2004 held in concert with the International Geological Congress in Florence and a second in Kyoto, Japan in early 2006. Papers that resulted from each of these symposia constitute this volume. The collection of papers comprising this Special Publication of the Geological Society of London is the result of these two interdisciplinary symposia.

This Special Publication of the Geological Society of London is divided into several sections: general geology, stratigraphy, magnetostratigraphy, and the stable isotope record; correlation and basis of the name Ediacaran; micropalaeontology; characterization of the Ediacaran biota; the nature of body plans; functional morphology; and the nature of the Neoproterozoic-Cambrian transition. Abstracts of some papers presented at each of these meetings that were not developed further are available on line at: http://www.geolsoc.org.uk/SUP18273. A hardcopy can be obtained from the Society Library.

We are indebted to many people for help in producing this volume. We have asked much from the authors and reviewers, and have been blessed with endless patience on their part. Thanks are due to the authors for the papers they contributed, and the reviewers for their assessment of the papers. Among the reviewers, Sören Jensen deserves special mention for his generous, and rapid, response to multiple requests. We also thank F. & G. Aceñolaza, P. Betts, A. Braun, D. Collins, D. Condon, M. Fedonkin, L. Frakes, J. Gehling, D. Gray, K. Grey, K. H. Hoffmann, R. Jenkins, B. MacGabhann, M. Laflamme, C. Li, A. Martin, M. Moczydlowska, G. Narbonne, T. Ohno, P. Parkhaev, W. Preiss, E. Savazzi, G. Schneider, A. Seilacher, E. Serezhnikova, R. Squire, J. Stilwell, W. Sun, C. Tassell, S. Turner and S. Xiao.

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We are tremendously indebted to the Geological Society of London, with special thanks to Angharad Hills, for the offer to publish this collection of papers dedicated to the understanding of Neoproterozoic Earth and the origin and early evolution of the Metazoa.

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