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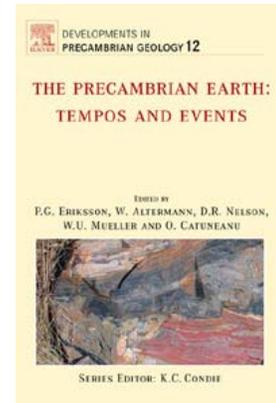
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The Precambrian Earth: Tempos and Events, edited by P.G. Eriksson, W. Altermann, D.R. Nelson, W.U. Mueller & O. Catuneanu, 2004 (hardback), 2005 (paperback). *Developments in Precambrian Geology*. Elsevier B.V., Customer Service Department, Linacre House, Jordan Hill, Oxford OX2 8DP, UK (Europe, Middle East and Africa). Elsevier, Customer Service Department, 11830 Westline Industrial Drive, St. Louis, MO 63146, U.S.A. (U.S.A. and Canada). 941 pages. Price USD 199.00; EUR 175.00; GBP 116.50 (hardback); USD 98.00; EUR 98.00 (paperback). ISBN: 0-444-51509-7 (paperback), 0-444-51506-2 (hardback).



Although the Precambrian era represents almost 85% of the Earth's history, our understanding of Precambrian geological processes is elusive and/or speculative in many cases. Yet, the Precambrian rock record generally has more potential for understanding and explaining early Earth processes than their recent counterparts, because of the inaccessibility of some recent environments (e.g., deep sea) and because present-day conditions differ in many respects fundamentally from those that prevailed during the Precambrian. Studying both Precambrian and younger rocks is therefore essential to understand the consequences of Precambrian evolution on Phanerozoic earth-system processes.

Elsevier's *Developments in Precambrian Geology* book series produces several valuable contributions since its establishment. While some of these books provide in-depth overviews of Precambrian tectonics, geochemistry and lithosphere/biosphere/atmosphere interactions, others describe Precambrian geological evolution of specific regions. The book entitled *The Precambrian Earth: Tempos and Events* in this series is quite different: it provides a comprehensive account of detailed information on the geological processes that shaped our Earth throughout the Precambrian era.

The book starts with a very informative account on the celestial origin of the solar system and the Earth, and the subsequent differentiation of the latter into core, mantle and crust (chapter 1). This is followed by an in-depth review (chapter 2) of detailed chemical and isotopic studies of meteorites (including strategies for detecting imprints of meteorite impact in the Precambrian rock record) and advancements in the study of nucleosynthesis. The granite/greenstone terrains constitute the nuclei of most present-day continents and therefore have significant implications for the continental growth processes. Various controversial and enigmatic aspects regarding the generation of continental crust (including the Isua rocks in southwest Greenland) are presented in chapter 2. Mantle plume and superplume events have significant influence on the crustal

growth, and many researchers believe that a close interrelationship between “plume tectonics” and plate tectonics was instrumental in Precambrian geological evolution.

Chapter 3 discusses the temporal distribution of mantle plumes, superplumes and Large Igneous Province records. Volcanic rocks constitute a significant component of Precambrian successions and deserve special attention. As pointed out on p. 272, the driving mechanism of volcanism throughout the earth history theoretically remained the same, and historical island arc eruptions (and Columbia River basalts) have their Precambrian counterparts. The obvious question that arises is therefore: where is the difference? The principal characteristics of Precambrian volcanism and related issues deserving special attention along with volcanic terminology essential for effective understanding of volcanic processes are described in Chapter 4.

Biogeochemical proxies encoded within the Precambrian sedimentary record enable us to study the origin and evolution of the early atmosphere and hydrosphere. Divergent views and understandings on the Earth’s early atmosphere and ocean chemistry are critically addressed in Chapter 5. Chapter 6, on the evolution of life and Precambrian bio-sedimentology, follows logically. The problematic detection of traces of ancient life in Archaean rocks are critically analysed in this chapter, as are the problems regarding stromatolite definition, classification, morphology and stratigraphy. This is succeeded by two excellent overviews of Precambrian sedimentation and its temporal evolution (Chapter 7) and by the application of sequence stratigraphy to Precambrian successions (Chapter 8), with case studies from Canada and South Africa (chapter 8). It is suggested at the end of the book (Chapter 9) that “major steps in the Earth’s Precambrian development occurred during “event clusters,” such as those at c. 2.7 Ga, c. 2.2-1.8 Ga and c. 0.8-0.6 Ga, separated by long periods of relative quiescence”.

This book is an excellent comprehensive entity of Precambrian earth, and in every sense, indeed! A number of renowned and active researchers have contributed sections/chapters. The organisation of the book is very good and the connecting links between the chapters are well focused. Each chapter begins with an introduction by the editor(s), followed by a series of papers by different authors in a logically ordered sequence. Unlike a summary, each chapter ends with a commentary that incorporates and discusses the views presented by the various authors. Individual chapters therefore have their own charm, and are well readable in isolation. The most positive approach of the editors, which—I believe—readers will equally well appreciate, is their sincere support and encouragement to express the existing diversity of opinions throughout the book! This is very important in the Precambrian context because many aspects of early earth evolution are intriguing and enigmatic, and one unique solution or opinion is— indeed—impossible in most cases! I fully agree with the editorial team that “Controversy often drives research” and am sure that this book will motivate students, researchers and professionals of Precambrian geology alike to start new research.

The book is well-planned with up-to date extensive references (a 150-pages long reference list!) and excellent photos and graphic illustrations. However, I have noted a few shortcomings. For example, in the caption of Figure 7.6-1, the reader is referred to see Figure 7.6-1(a) for the stratigraphic order and location of Chaibasa, Dhalbhum and volcanics (surprisingly enough without any lithostratigraphic unit!) but no stratigraphic order is presented, and the location of the Vindhyan basin and those of the Chaibasa, Dhalbhum and volcanic rocks are shown incorrectly. Although mentioned in the text, the “Jharkhand Formation” (volcanics?) is not shown on the map (p. 644-645). I sincerely hope such shortcomings will be duly taken care of in a possible next edition.

Needless to mention, this book will be an asset for the libraries of academic Institutes, and we must be grateful to the editorial team, the series editor and Elsevier for making available such an excellent piece of work to the geoscience community.

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