

In short, this is a highly recommended book for the student of particle physics who has studied the basics of quantum field theory and the phenomenology of the known elementary particles. In addition, it is a handy source of information (and more valuably, explanations) for senior students and practising physicists in other areas, who will increasingly feel the need to know about the area of fundamental science most finely poised today for a dramatic experimental breakthrough.

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**Annual Review of Earth and Planetary Science 2005.** Raymond Jeanloz, Ardan L. Albee and Kevin C. Burke (eds). Annual Reviews Inc., 4139 El Camino Way, Palo Alto, CA 94306, USA. 710 pp. Vol. 33. Price not mentioned.

The editors of this volume under review open their preface with statements that '*Earth and planetary sciences have experienced a remarkable blossoming over the past decades. The research disciplines have a broader range of social and political impact than ever before, from addressing resource and security needs to mitigating natural hazards, remediating environmental impact, and documenting global climate change*'. The pace of growth of new knowledge in the area of earth and planetary sciences has increased enormously; as a consequence, the *Annual Review of Earth and Planetary Sciences* continues to serve as a useful resource for capturing the breadth of new developments in this area of knowledge.

The volume deals with several interesting aspects of the subject. These include the early history of atmospheric oxygen, the famous 1200-km-long dextral strike-slip fault zone of northern Turkey (the North Anatolian Fault); processes of orogenic collapse with reference to the Alps; early crustal evolution of Mars; representation of model uncertainty in weather and climate prediction; real-time seismology and earthquake damage mitigation; lakes beneath the Antarctic ice-sheet; subglacial processes that include aspects of subglacial hydrology,

subglacial mechanics, sliding, sediment deformation and glacial landforms; feathered dinosaurs, molecular approaches to marine microbial ecology and the marine nitrogen cycle; earthquake triggering; evolution of the continental lithosphere; ichthyosaurian evolution; Ediacaran biotas; mathematical modelling of whole landscape evolution; volcanic seismology; models and outstanding questions of the interiors of giant planets; the Hf-W isotopic system and the origin of the Earth and Moon; planetary seismology; atmospheric moist convection; and orographic precipitation. A survey of some of these topics clearly points towards a continuing interest amongst earth and planetary scientists on questions related to the origin of the planets, the earth and the Moon; issues related to planetary seismology and real-time seismology for earthquake damage mitigation; questions related to climatic and tectonic aspects of orogens; issues related to continental ice-sheets; and evolutionary aspects of fish-shaped reptiles, feathered dinosaurs, and Ediacaran biotas. Such is the spread of earth and planetary sciences, knitted together with the threads of geologic time.

Much of the material is of considerable interest to earth scientists in India. Given the active tectonic environments of India, the reviews related to (a) the seismically hazardous Anatolian fault, (b) methods for predictions of subsequent ground motions from initial earthquake displacements, (c) processes of orogenic collapse that involve transfer of gravitational potential energy by extension in the core of the orogen and synchronous shortening in the foreland regions, are of strong relevance to Indian earth scientists.

India is bestowed with extensive Archaean and Proterozoic geological records; it is in this context that the review on the early history of atmospheric oxygen is of special significance. The evolution of oxygen concentrations in the Precambrian is incompletely understood. More needs to be known on the timing of cyanobacterial evolution, evolution of ocean chemistry, nature of carbon cycling and the influence of nutrient limitation on primary production to be able to understand the early history of atmospheric oxygen.

Another aspect of significance in the Indian context is the subject of orographic precipitation. It will always remain our aim to predict orographic precipitation in future climates. We live in the shadow of the Himalaya, and an 'understanding of the probability distribution of orographic pre-

cipitation events in the current climate, as well as the mechanisms responsible, will be useful in evaluating how changes in that probability distribution would lead to different precipitation rates'. The volume also contains an article on Antarctic subglacial lakes – lakes several kilometers beneath the ice sheet. This subject should be of interest to our Antarctic research programmes.

This review has attempted to provide a flavour of the rich content of the volume – this is a volume which is worth exploring both by the specialists and the generalists as it provides a broad view of the advances being made globally in earth and planetary sciences, both in the context of basic and applied aspects. Many of the subjects covered in the volume have a strong societal relevance and should therefore be of interest to a broad spectrum of science managers who deal with earth resources, disaster management and mitigation, and climate change issues.

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**Last Frontiers of the Mind – Challenges of the Digital Age.** A. Mohandas Moses, Prentice-Hall, New Delhi. 2005. 440 pp. Price: Rs 395.

The book 'Last Frontiers of the Mind' deals with two distinct, though related issues: (i) the relation between body–mind and consciousness (ii) the prospects of the computer-based Artificial Intelligence dominating over human intelligence and eventually assuming the role of the master that will dictate the future of humanity.

On the first topic, Mohandas Moses starts appropriately with a reference to Hippocrates of 5th Century BC; Hippocrates is regarded as the father of scientific medicine (most of us are familiar with the Hippocrates Oath which is a guide to medical ethics and practice). He was the first to recognize that the seat of consciousness is not in the diaphragm of the heart but in the brain. Hippocrates asserted: 'Some people say that the heart is the organ with which we think and that it feels anxiety. But it is not so. Men ought to know that from the brain and from the brain only arise our pleasures, joys, laughter and tears. Through it in particular we