



**The Little Book of Planet Earth.** Rolf Meissner. Copernicus Books, 37 East 7th Street, New York, NY10003, USA. 2002. 202 pp. (English translation of the original German edition) Price not stated.

Exhaustive tomes, written more for specialists, are available about the earth but since the 1970s, application of advanced instrumental techniques aided by computer technology to problems in geoscience has resulted in fresh thinking and revision of many of the existing views. A simple book incorporating them for non-specialist readers is what Rolf Meissner, a former Professor of Geophysics at Kiel, Germany offers in this publication. After dwelling on the ideas of the ancients about the earth's place in the solar system, Meissner narrates how growth of scientific inquiry led to better understanding of the planetary system and how, for example, the discovery of radioactivity heralded innovative approaches to solve baffling features of the earth. The role of seismology in deciphering the structure of the earth's interior, tracing subducted crustal slabs, locating thermal anomalies, exploring mineral deposits and the study of the earth's free oscillations are emphasized. A full chapter on the earth's magnetic field discusses how this has helped in reconstructing the earth's palaeogeography through palaeomagnetism, which in turn contributed to the subject of magnetic stratigraphy, magnetic reversals, sea-floor spreading and plate tectonics.

No book about the earth will be complete without discussion on the physics and chemistry of the minerals in the crust and mantle of the earth and the author has not ignored them. Highlights of compositional shifts of minerals and rocks with increasing depths, metamorphism of rocks or their breakdown to sediments and sedimentary rocks are well documented. The author aptly points out how these rocks formed at various times of the earth's history serve as useful records to interpret the likely

geological scenario of those times. For example, it is only through such records that we infer that the earth's interior was much hotter during the turbulent pre-Archaeon times and that the thin crust that formed and survived was subjected to intense volcanism producing early crustal segments of greenstone-granulite belts, magnesium-rich komatiites and diamondiferous kimberlites. Such rock records have also helped to infer about development of oxygen in the atmosphere. The author traces how the oceans were oxygenated first with the emergence of photosynthesizing forms of marine life. The banded iron formations of ferric oxide are products resulting from such oxygenation when the dissolved ferrous iron became oxidized to these ferric forms; and likewise, the continental red beds of the Proterozoic indicate rise of oxygen in the atmosphere. The book rightly covers recent ideas about the fluctuating nature of early atmosphere and climate caused by a surfeit of volcanic gas emissions, reduced solar luminosity, a highly tilted earth-axis (obliquity-obliteness view) all of which led to global snow cover during Neoproterozoic.

Rolf Meissner has justifiably devoted considerable space to the revolutionary plate tectonic theory, tracing its roots from Alfred Wegner's concept of continental fits to the shaping of the full-fledged theory during the 1960s. The important aspects of this theory and related orogenic processes like mountain-building and basin formations are explained with good illustrations. Towards the end, a chapter brings out new concepts and discoveries coming out through seismological studies like seismic tomography, seismic anisotropy, seismic boundary evaluation, terrane concepts, delamination processes and plume theory. The last few pages deal with fundamental aspects of the origins of life, both exogenic and endogenic, the molecular chemistry involved and evolution of life to higher forms with passage of geological ages. An epilogue discusses the available non-renewable resources of the earth and emphasizes the need to tap alternate sources of energy like the nuclear, solar, wind and geothermal forms.

The book is mainly a description of the earth through the eyes of a geophysicist, particularly that of a seismologist. However, those readers who may be looking for some of the important contri-

butions and breakthroughs achieved through geochemical, petrological and palaeontological research, which have also considerably enhanced our understanding of the planet earth, during the last couple of decades, will miss them.

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**Flora of Udupi.** K. Gopalakrishna Bhat. Indian Naturalist, Udupi. 2003. 913 pp. Price: Rs 1200/US \$ 50.

The area covered is the Udupi taluk (Udupi district, Karnataka), a representative sector of the west coast of the Indian peninsula and notably species-rich, including coastal and mangrove elements. About 1242 species of flowering plants belonging to 694 genera from 171 families are treated with 288 text figures and 160 colour photographs. A short introduction on location, physiography and vegetation (pp. 1-6) is followed by key to the families (pp. 7-20), the floristic treatment (pp. 21-870) and indices both to the scientific names (pp. 871-903) and to vernacular names (pp. 904-913). The text is clearly set forth with adequate use of bold face and italics, and is free of error.

Each family is treated in the following sequence: family characters, key to genera, generic characters, key to species and treatment of species. Each species, in turn, has the correct name [often with one or more of the common synonym(s)], a short description, occurrence in the field with duration of flowering and rounded off with the vernacular name(s).