

istence even in the early phases of the Earth's history. The article chronicles the sequence of tectonic events comprising the East African Orogen (EAO). Of special interest is the mention of granulites of southernmost India and Sri Lanka, which were earlier thought to be Archean and Paleoproterozoic, but have since been proved to be Neoproterozoic (660–550 Ma). The author suggests that the younger ages indicate a second younger collision event between the west and east Gondwanic continents. He further states that collision along EAO led to the crustal overthickening and development of strike-slip shear zones and faults related to extensional basin. The modern analogue is the 'escape tectonism' observed in parts of the Himalayan orogen.

Reading this type of compendiums gives you an experience akin to a space mountain ride in Disney World. From a breathless ride in the realm of Neoproterozoic world, we are thrown into a mundane world of earthquakes and active tectonics, and again to much rarefied fields of tectonic evolution of Venus, radar investigations of Mars, Mercury and Titan and physics of zodiacal dust and the mind-shattering enigma of origin of life. I like to focus on the chapter on earthquakes and active tectonics first, being the topics that are closer to my heart. H. Kanamori gives a succinct review of the physical processes of earthquake generation in his article on 'Mechanics of earthquake generation' (vol. 22). There have been significant advances made in the study of slip distribution on a fault. Seismic imaging of major earthquake zones shows that slip models can be interpreted in terms of 'barriers' and 'asperities', ideas to which Kanamori himself has made significant contributions. He emphasizes the mechanical models of faulting involving the factors such as macroscopic and microscopic static stress and dynamic stress fields. The article on 'Active tectonics of the Aegean region' by James Jackson (vol. 22) deals not only with earthquakes, but also tectonics. What is most interesting here is the abundance of observational data, precluding any element of speculation. The whole dynamics of the deformation is built upon from the high quality seismicity data

and measurements of velocity field in the fault zones using space-based geodetic techniques.

Christopher F. Chyba and Gene D. McDonald review some current issues related to origin of life and exobiology research (vol. 23). Consensus is that *sine qua non* of life is liquid water. Thus, search for life is essentially a search for liquid water. This view is criticised as being born out of 'parochialism' by a group led by irrepressible Carl Sagan. An alternate view insists that extraterrestrial life may look quite different from what we are accustomed to. The article also brings out some salient issues concerning the origin of life on Earth. The questions on the sources of energy available to force the prebiotic organic synthesis are also addressed. A 'chicken or egg' problem haunts the researchers in this field. Which formed first: RNA or proteins? The majority favours RNA. On the whole, the authors have done a thorough job and leave out nothing on one of the most engaging areas of interdisciplinary research today.

Some reviews deal with emerging fields. What appeared most exciting to me in this category is an article titled 'Geomorphology and *in-situ* cosmogenic isotopes' by T. E. Cerling and H. Craig (vol. 22). This article presents an avantgarde method to date the geomorphologic surfaces using the production rates of different cosmogenic isotopes. This method of dating the erosional surfaces will help to resolve some of the long-standing problems in geomorphology, archaeology and active tectonics. The work of an Indian scientist, D. Lal finds repeated reference in this paper. Fortunately, a solid infrastructure and a strong tradition exist in our country that is helpful to strengthen and diversify this line of research to solve some specific problems.

The annual reviews also contain articles in the domain of planetary sciences, in particular about radar imaging of Mars and Venus. Other chapters in the volumes cover a potpourri of topics. As no book review is considered in order without a few quibbles, I would like to add that a topical arrangement of articles would have made these volumes more reader-friendly. On balance, I must say that these articles open up wide

vistas of future research, and remind us most emphatically that the earth sciences have really come of age into a world of high quality data, high resolution and increased quantification of natural processes. And, they are recommended to both professionals and students for these reasons.

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**Biology of the Fungi** by Dr J. G. Vaidya. Satyajeet Prakashan, I Floor, Sulochan Apartments, Pune 411 038. 1995. I Edition. 670 pp. Price not known.

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Fungi have been getting increased recognition as important components of the microbial world and presently global attention is focused on aspects of biology, biochemistry and biotechnology of fungi for enhancing our knowledge base essential for achieving progress. In this context, a book dealing with Biology of Fungi to provide authentic information on the subject is most welcome.

The book on the *Biology of the Fungi* attempts to give an overview of the salient aspects of fungi under two major sections, viz. Fundamentals (Part I) and Fungi in Action (Part II). Topics dealt with under the Fundamentals section include biological characters, vegetative growth and reproduction, ultrastructure and nutritional aspects. In the second part a wide range of topics including fungal pathogenesis, nutrition and metabolism and role of fungi in biodeterioration and biodegradation are covered. Two chapters are also devoted to fungal metabolites and role of fungi in biotechnology.

The author has stated that he has chosen a 'multidisciplinary approach for making fungi comprehensible to the layman' while the references are included for the sake of 'students and research workers'. Each section comprises of six chapters and the contents of each chapter are presented under many subtitles.

While appreciating that the author has expended considerable effort in compiling information pertaining to fungi and presented them in a manner



that he has felt optimal for meeting the requirements of his target readership, it appears that for the uninitiated reader, the text is somewhat disorganized to get a comprehensive picture of biology and biotechnology potential of the fungi. For example, the Section I in Chapter 2 deals with heterotrophic carbon nutrition before the aspects of vegetative growth, reproduction and ultrastructure are presented. Nutrition and metabolism including metabolic pathways of carbon utilization are described in Section II. Fungal ecology and distribution (Chapter 8, Section II) should have come in the first section since it cannot be adequately justified to find a place under Fungi in Action. In providing the subtitles and making the descriptions brief or replacing the text with several tabular statements, the author seems to have made it somewhat difficult for gaining a full appreciation of the subject, particularly to the inexperienced student of mycology and fungal biotechnology. There is a paucity of vital information in the text on topics such as fungal biodiversity, selective techniques for pure culture isolation, conservation and identification, genetic

variation in *in vitro* cultures, sporulation, dormancy and mechanism of survival in the natural environment. In the area of genetic engineering involving fungi (page 512), for example, no reference is made to the recent spectacular developments of using filamentous fungi as hosts for heterologous expression of eukaryotic and mammalian proteins like chymosin. That fungi are increasingly becoming preferred hosts in molecular biology due to their efficient protein-secreting potential has also not been mentioned.

In the chapter on Biotechnology, it is surprising that gibberellins are treated under non-industrial products and the description of the whole fermentation is mentioned in just a few lines giving only trivial and insignificant details (page 564). Likewise the description of  $\beta$ -carotene fermentation (page 562) by mucoraceous fungi without detailed mention of the involvement of heterothallic strains and formation of zygospores is a serious omission in a treatise dealing with biology of fungi.

Several additional discrepancies can be listed but it is adequate to state that the text while providing information on

several aspects of fungal metabolism, biochemistry and biotechnology lacks the essential emphasis on those critical aspects which will enable the reader to obtain a comprehensive picture of the biology and biotechnology of fungi. Several errors (e.g. 'hemicellulose is half cellulose molecule' (page 22) and reference to Fig. 2.1 (cellulose) under hemicellulose), spelling mistakes and ambiguous construction of sentences/descriptions (e.g. comparison of fungi and ant colony under social organization (page 11)) also deter the value of the book to a considerable extent. References cited to original papers include many which are not readily accessible to the readers. Perhaps references of relevance to some authoritative reviews on special topics in Annual Reviews etc. would have been more helpful and useful to the readers.

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