

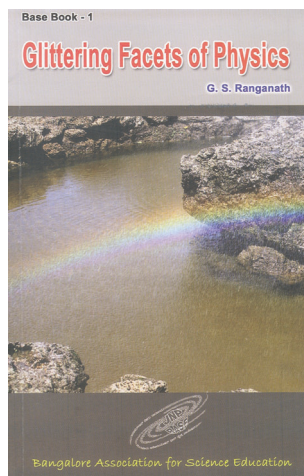
TIFR – the ‘cradle of the atomic energy programme’ – as a centre dedicated to pure research, and the Atomic Energy Establishment (AEE) as a mission-oriented organization. In Mark Oliphant’s words, he built one around individuals and the other around tasks. Even so, there were ambiguities in the relationship, leading to difficult situations and decisions involving the two. Even within TIFR, we read, there were changes of policy and directions which seemed unavoidable, but led to some bitterness. It is a tragedy that Bhabha died in an air crash in 1966, when he was not yet 57; one feels somehow sure that he would have handled these ‘problems’, and continued to provide leadership, imaginatively.

To sum up, Phalkey has written a very well-researched book on the emergence of nuclear physics as a research field in India during a crucial phase of our history. There are numerous footnotes and references in each chapter rounding out an absorbing account. It seems that no other area in science – neither chemistry nor biology – lends itself to such a study and all the lessons it teaches us. In a way this book reminds us of Constance Reid’s acclaimed biography of David Hilbert, in that Reid was not a professional mathematician and yet wrote so well.

This account may well lead us to revise our views of several leading figures in our science in the past. Many decades have passed since those times, so we should view individuals and events dispassionately. It will be of enormous interest to all those associated with or working in IISc, SINP, TIFR, DAE and CSIR today, not to speak of the wider scientific community of the country. We should not ignore history, but we should not feel trapped by it. We need to learn from it and move on.

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**Glittering Facets of Physics.** G. S. Ranganath. Bangalore Association for Science Education, Jawaharlal Nehru Planetarium, T. Chowdaiah Road, High Grounds, Bangalore 560 001. 2014. 152 pp. Price: Rs 100.

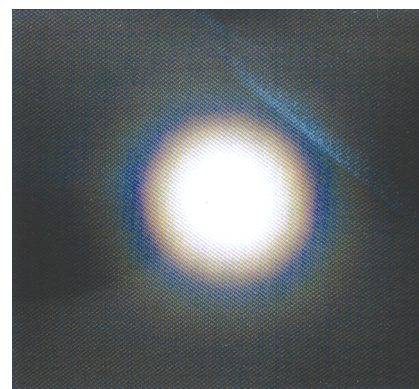
This book is the first of a promised series to be brought out by BASE – the Bangalore Association for Science Education. Typing these four letters into a *Google* window will bring up a well-known chain of coaching classes for competitive exams leading to professional education. This lesser known BASE has, in a sense, been doing the opposite for more than two decades – exposing school students to science in a manner based on discussion and activity, at the Jawaharlal Nehru Planetarium, which it oversees. G. S. Ranganath has given many lectures on classical topics in physics in this forum, which have been greatly appreciated by his students over the years. It is not surprising that there was a strong feeling that they should reach a wider audience in book form.

I do not know of another physics book quite like this one, perhaps best described as a roller coaster ride through a wide range of classical topics – the solar system, laws of motion, electromagnetism, light and the Earth. The chapters do not teach in a conventional sense – they expose, excite, enthuse, encourage. The comments and explanations are terse and the transitions can sometimes be abrupt – but in what other book would one move from sharks to alligators to head injuries to glass chimneys around kerosene lamps, in the span of four pages? The choice of material and sequence is uniquely the author’s own. And the glittering facets go beyond what is conventionally

regarded as physics – there is a soft corner for the living world which shows through. For example, the reader can contemplate the ratio of bone to total mass of multiple species, and learn what it tells us.

This is not one of those books which talk down to children. In fact, my guess is that it may be a challenging starting point for the average student, but will certainly cater to the strongly motivated ones, and should be a valuable resource for their teachers. Given that most of the topics covered are part of the standard XII syllabus, this kind of material will be a breath of fresh air in classrooms made dreary by routine drill, oriented towards competitive exams. Even hardened physicists like this reviewer will find gems to take away – I did not know that Cavendish performed his experiment on an apparatus inherited from John Michell (who has priority over Laplace regarding the black hole idea), or that many people had dropped weights from towers before Galileo allegedly did so. The electric bell and electric motor are common places of high-school education, but the purely electric (i.e. no magnetic fields) bell and motors were a revelation to me.

History is given its due. It covers not just the standard heroes – Newton, Galileo – but even school children who came up with brilliant ideas – have you heard of Laura Drew or Vincent Converse? The rapid guided tour of concepts, applications and connections remains the major feature of this book. One concern is that it does not seem to have the backing of a publisher. Organizations like BASE are usually not geared to the strategies of the book trade. One hopes that word of mouth and reviews will help the book find the audience that it richly deserves. A second printing can address some



Corona due to pollen grains

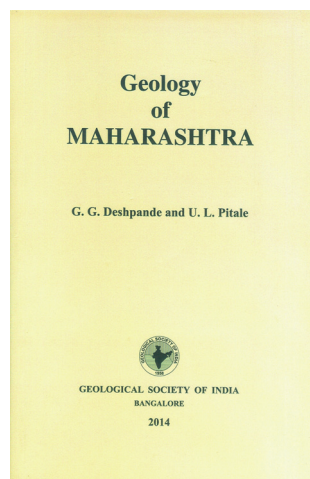
## BOOK REVIEWS

printer's devilry – made more devilish by the autocorrect feature of modern word processors. Kepler the amateur became an armature, and Tesla the Serbian, a Siberian!

I would have liked to see the law of refraction credited to Ibn Sahl who lived in Baghdad some 700 years before Snell. Given how short the book is, each reader will no doubt have a list of omissions of pet topics. But that cannot take away the author's achievement – this is the kind of book which can get a student hooked onto physics, if it falls into her hands at the right time. There is a need for such books, catering to each new generation, the way George Gamow's writings catered to the author's – (and reviewer's!) – generation. This is true even in the age of the internet – the ocean which contains everything one could hope to find. What is crucial is the personal perspective which a mere aggregate cannot convey. BASE has made a good beginning with *Glittering Facets of Physics*, and set a high standard for its successors.

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**Geology of Maharashtra.** G. G. Deshpande and U. L. Pitale. Geological Society of India, PB 1922, Gaviipuram P.O., Bangalore 560 019. 2014. viii + 266 pp. Price: Rs 500.

The state of Maharashtra is bestowed by diverse lithology ranging in age from

Archaean to Recent, some of which are associated with rich mineral deposits. Maharashtra hosts important and unique rocks from Indian geology, mostly belonging to the Dharwar craton, Central Indian Supracrustal Belt and Bastar craton. Besides this, it occupies a unique place in the physiography of Peninsular India with the lofty Sahyadri Ranges and the Konkan plains towards the west, the Satpuras hills to the north and the Deccan plateau proper. The grandeur of some landforms like basaltic hill ranges along the escarpments, mesas, buttes and coastal landforms like the basaltic wave-cut platforms, sea cliffs and sea caves are unparalleled in Indian geomorphology. Numerous rivers like the Krishna, Pranhita-Godavari and Tapi dissect, drain and nourish the fertile soils that support agriculture and horticulture.

The book under review is among a series of textbooks published by the Geological Society of India, Bangalore, that intends to appraise the students and professionals with the geology, stratigraphy and mineral resources of the state. The book is divided into nine chapters, mostly dealing with rocks that were formed at a specific time interval in Earth's history. In the introductory chapter, the authors provide informative and educative insights into the administrative divisions of Maharashtra, which generally tend to match with the agroclimatic and physiographic regions of the state. The chapter also provides glimpses on climate, soil, drainage, vegetation and landforms that would interest the students as well as those preparing for competitive examinations. The second chapter 'Historical review' deals with interesting snippets such as naming of Gondwanaland and Gondite rock after the Gond tribe from Nagpur region. It also gives a narrative on how the geology of Maharashtra has engaged the attention of geologists right from the advent of geological studies in India. The authors have done a great job by including the coloured geological map of Maharashtra and a simplified stratigraphic table that have great practical utility.

The authors need to be congratulated for their excellent summary on the Central Indian Supracrustal Belt. Their authoritative account of this important but complicated part of Indian geology reflects their in-depth knowledge and understanding of the terrain. Despite scanty radiometric ages, the authors have

provided a vivid and elaborate description of lithology, stratigraphy and the associated Amgaon, Sakoli and Satpura orogenies that makes pleasurable reading even to the layman. The content is precise, to the point and illustrated with field photographs and lithostratigraphic tables. An informative summary on the pre-existing geochronological data versus field disposition of the supracrustals is presented on Archaean rocks. The authors introduce the chapter on Purana Basins with an account of the Great Eparchaean Unconformity – an approximately 400 million year event of erosion and non-deposition in Peninsular India. After briefly introducing the Purana Basins of India, the authors deal with the spatial distribution, stratigraphy and sedimentation of the Kladgi Supergroup in the Kolhapur-Sindhudurg area of southern Maharashtra and the Pakhal Supergroup in the Pranhita-Godavari basin of northeast Maharashtra.

The coal-bearing Gondwana Supergroup has received special attention in the book with elaborate tables, illustrations and photographs. The authors describe the overall intracratonic distribution, structure, tectonics and fossil assemblage of the sediments. A great deal of effort has gone into explaining the classification of Gondwana strata; evolving a consensus on stratigraphy and attempting inter-basin correlations. The authors deserve appreciation for their attempt at simplifying some of these aspects for the readers. The topics on change in climate and environment of deposition make interesting reading. The Gondwanas have also been discussed at length at a formation level from important coal fields of Maharashtra. They have also included a small but informative chapter on the Infratrappeans. It deals with important stratigraphic units like the Bagh Beds, Lametas and other unclassified infratrappean sediments from Maharashtra. While the Lameta sediments have received greater attention in terms of rock types, stratigraphy and palaeontology, the content on the Bagh Beds is of a preliminary nature and needs to be updated in terms of developments in stratigraphy and environment of deposition described in recent publications.

Geologically, Maharashtra is synonymous with the Deccan Traps – the second most extensive geological formation in Peninsular India. The authors have done a commendable job in describing