

## BOOK REVIEWS

a lot and keep abstract of new developments. There is also considerable interest and activity in computational neuroscience, so I feel much at home. I am an adjunct at the Salk Institute, and I currently work in . . . Sejnowski's laboratory. The lab has tea every afternoon, and various people drop by – often Francis Crick, and some of the visual psychologists, such as Ramachandran – and we discuss everything from consciousness and free will to apparent motion to NMDA receptor.'

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1 Gardner, H., *The Mind's New Science: A History of the Cognitive Revolution*, Basic Books, New York, 1985.

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**Development of Ideas in Physics.** Nils Ryde. Almqvist & Wiksell International, P. O. Box 4627, Alsnogatan 7, S-116, 91, Stockholm, Sweden. 196 pp. Price: Not known.

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The rapid strides made during the first half of this century and a little earlier, have been the subject of numerous books in physics. Indeed, for several decades now, an introductory description of this area commonly known as 'Modern Physics' is an integral part of undergraduate physics curriculum in every university. It includes topics such as the discovery of electron and atomic nucleus, optical and X-ray spectroscopy, discovery of electron spin, neutron, nuclear fission and fusion and introductory quantum mechanics. The well-known textbook by Richtmyer, Kennard (and Cooper in later editions) gives an excellent exposition of these topics. Recent textbooks on modern physics like the one by Kenneth Krane also include more contemporary topics such as nucleosynthesis in stars, quark model of elementary particles and so on.

This book is a collection of a dozen partly didactic and partly historical essays on topics in modern physics. The author has been a participant in the events that unfolded in the 'golden age of physics', and his familiarity with them comes through clearly in his writing. His

prose is direct and unostentatious. Most of the essays are well written, especially the ones on 'optical spectroscopy' and 'origin of the elements'. Some, however, are sketchy and need additional material for completeness (for example, the essay on matter and antimatter). The narration could have been made much more interesting with some illustrations and biographical sidelights on the main characters of the story. The quality of production is good, though a few errors remain. (For example, eq. (12) on p. 37 and eq. (21) on p. 44 contain printing errors.)

The main limitation of the book is that the essays are too 'dense' in the subject matter to be comprehensible to a beginning student. For example, in the space of some 15 pages, the author describes the rise of quantum mechanics from Heisenberg's 'arrays', deBroglie's matter waves to the successful QED explanation of the Lamb Shift in hydrogen. Such a compact description is obviously suitable only for those who are already broadly familiar with the theme. Despite this, the book does fill a certain need, since the more authoritative and complete historical accounts of modern physics (such as *The Conceptual Development of Quantum Mechanics* by Max Jammer and *Inward Bound* by Abraham Pais) are too expansive to be read with ease. The book provides short and useful historical summaries of several interesting topics, which teachers and physicists can profitably use for enrichment and recapitulation of what they already know.

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**A Modern Introduction to Ancient Indian Mathematics.** T. S. Bhanu Murthy. Wiley Eastern Ltd, New Delhi, 1992, 214 pp. Price: Not mentioned.

**Indian Mathematics and Astronomy.** S. Balachandra Rao, Jnana Deep Publications, 2388, 13th Main, A-Block, Rajajinagar, II Stage, Bangalore 560 012, India. 1994. 234 pp. Price: Rs 75, \$17.00.

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A man is known by the company he keeps. I suppose a similar statement holds for books as well. One of the

books under review (*A Modern Introduction to Ancient Indian Mathematics*) suffers because of its unqualified association with Swami Bharati Krishna Tirtha's *Vedic Mathematics*. The author mentions in the preface that the initial purpose of the book was to present proofs of certain propositions stated in *Vedic Mathematics*, thus subtly authenticating it. (It is more an error of omission than of commission as he fails to warn the readers about the doubts expressed by scholars in respect of many of Swamiji's claims.) First, a few words about *Vedic Mathematics*. It is more or less established that its contents are not of vedic origin (the Swamiji has failed to produce a reliable reference) and its mathematical contents do not, by a long chalk, justify the tall claims made in the book. Take the example of the algorithm to write down the decimal expansion of reciprocals of certain integers. As has been pointed out by S. G. Dani in his excellent two-part article ('Myths and Reality – On Vedic Mathematics', *Frontline*, 22 October 1993 and 5 November 1993), there is no evidence in the available vedic works or even in the works of other Indian mathematicians for over 2000 years later, of any knowledge of writing a fraction in decimal form. Unfortunately, this is one of the propositions Bhanu Murthy chooses to prove in his book.

Apart from these proofs (of Swamiji's propositions), Bhanu Murthy's book contains a well-written account of the Pell's equation (which he prefers to refer to as Brahmagupta-Bhaskara equation). There is also a chapter entitled 'Selected Topics in Geometry' and the reviewer fails to understand why some of the topics which are featured are there at all; for instance, Morley's theorem [which would have had some meaning at least if he had given the elegant proof due to M. T. Naraniengar in 1909 (see *Geometry Revisited*, Coxeter and Greitzer)].

On the other hand S. Balachandra Rao's book, *Indian Mathematics and Astronomy*, provides a good introduction to the development of mathematics and astronomy in India since vedic times. Each mathematician's contribution is preceded by a discussion on his place and times according to available records. In fact, one of the praiseworthy features is that statements made are justified with references and different viewpoints are sincerely reproduced. There is an excellent bibliography at the end.