# Brief reviews

**The Physics of Monsoons.** R. N. Keshavamurthy and M. Sankar Rao. Allied Publishers Ltd., 13/14, Asaf Ali Road, New Delhi 110 002. pp. viii + 199. Price Rs 150.

The Asiatic summer monsoon is a large-scale seasonal atmospheric phenomenon of great economic and societal importance. It is produced by ocean, land and atmosphere interactions occurring over several parts of the Globe—some antecedent to and others concurrent with the monsoon.

Through the applications of the laws of physics and the employment of mathematical methods, scientists have learned a good deal about these interactions. The book under review gives a brief account of what has been learned, with special reference to the summer monsoon over India and neighbour hood. Most of the material presented in the book deals with the research work done by Indian meteorologists, to which the contributions by Keshavamurthy and Sankar Rao have been significant. Accurate prediction of the behaviour of the monsoon over time-scales of a week, a month, a season or a decade needs, however, a much greater understanding of the interactions of the atmosphere with the oceans and the land masses on a rotating earth, under a seasonably changing solar heating.

The book is divided into seven chapters which deal with observational data, theoretical discussions and the results of a few numerical experiments. The first chapter deals with the morphological features of global and regional monsoon circulations. General circulation models are also briefly presented. The second chapter deals with the structure of monsoon disturbances and the various instability theories about their formation. Numerical studies of monsoon depressions are touched upon. The third chapter describes the variability of the monsoon on different time-scales. The 30–50-day oscillations are dealt with observationally and theoretically. On the intra-annual scale, possible teleconnections with the 'sea-saw' pressure oscillations between the eastern and western parts of the South Pacific Ocean (the so-called Southern Oscillation) are outlined. On the longer time-scales observational and 'model' studies are described. In the fourth chapter we have a discussion of the interaction between the monsoon and the middle-latitude circulations of both the hemispheres. Both the observational and theoretical aspects are discussed. The fifth chapter deals with air–sea interaction in the monsoon region. This reviewer feels that the physics of evaporation over the oceans ought to have been dealt with in some detail.

The sixth chapter—just seven pages, of which a greater part is occupied by satellite cloud pictures–deals with satellite studies of the different phases of the monsoon and monsoon disturbances. The seventh chapter—just 4½ pages—deals with monsoon prediction very inadequately.

There are eight pages of references and one page of bibliography. There is also a very useful and brief appendix on the elements of dynamic meteorology and the basic equations of atmospheric dynamics.

The book is heavily illustrated with maps, charts and diagrams. This is a good feature of the book.

There are no scientific errors. Apart from meteorologists, mathematicians and others interested in meteorology would benefit by a study of this good, clearly written book.

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**Applied Elasticity.** Zhilun Xu. Wiley Eastern Ltd., 4835/24, Ansari Road, Daryaganj, New Delhi 110 002, India, 1992. 190 pp.

A new book on an old subject is like old wine in a new bottle. *Applied Elasticity* by Zhilun Xu is an English version of a book originally brought out in Chinese by the same author. Semantics and conventions used in the book are different; for example, in this book spatial means three dimensional; physical equations imply Hooke's law and strain displacement relations are called geometrical relations. Index at the end is compiled using section numbers instead of page numbers.

The book has 126 sections in 16 chapters and the introduction includes some basic concepts and assumptions. Six chapters deal with plane problems in cartesian and polar coordinates Complex variable, thermal stresses and finite difference methods are also included. Four chapters are devoted to 3D problems including torsion. Variational methods are outlined in chapter 11. Last four chapters deal with plates and shells. Cylindrical shells and shells of revolution are discussed in separate chapters. Index lists about 300 entries, including 28 famous elasticians from Hooke to Mindlin.

Chapter 1 introduces homogeneity, isotropy and small strain assumptions of applied elasticity. Chapters 2 through 6, deal with plane problems, complex variables approach and thermal stress problems. Chapter 7 presents the finite difference methods for plane problems.

Chapter 8 through 10, deal with 3D problems. Solutions to various classical problems are described following a functional approach. Torsion of solids and hollow section forms chapter 10. Chapter 11 introduces variational methods along with some application of theorems of uniqueness and reciprocity. Chapters 12 through 16 deal with plates and shells—cylindrical shells and shells of revolution are discussed in separate chapters.

The selection of articles seems to be largely influenced by two books of Timoshenko and his associates listed in the references. The first book alone (by Timoshenko and Goodier) contains 500 pages with 250 illustrations. If we add an equal amount to account for plates and shells (by Timoshenko and Woinowski-Kreiger), and compare this with a 370-page book with 150 figures, it becomes clear why the present book reads more like a handbook than a text as the author intends. The book is useful as a reference, but not as a text.

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