

# reviews

## Basic modern astrophysics

Paul Davies

*The Structure of the Universe.* By Jayant Narlikar. Pp. 264. (Oxford University: London, Oxford and New York, 1977.) £4.25.

THE name of Jayant Narlikar has long been associated with the steady-state theory of the Universe, the absorber theory of radiation and other controversial aspects of modern cosmology. Now he has used his fertile imagination to produce a readable and useful introductory book to astronomy and cosmology. Although the first half of the book deals in a conventional manner with standard topics such as stellar evolution, galactic structure and Friedmann cosmological models, some of the legacies of the author's more speculative past research emerge in later sections. The chapter entitled *The Universe and the Arrow of Time* will be familiar to those who have read Professor Narlikar's earlier (much more specialist) book written with Sir Fred Hoyle, although the uninitiated will probably be unable to follow the subtleties of the arguments about past and future absorbers, and initiates may well disagree with the conclusions.

The text has obviously been prepared with a view to commanding a wide readership which can range from the scientifically-inclined layman seeking an easy-going summary of this popular subject, up to astronomy and physics undergraduates requiring background or introductory reading. To this end the mathematics has been kept to a minimum, and where possible is separated from the main part of the text in special boxes. There is a liberal distribution of graphs and line drawings, some of which seem to have been prepared hurriedly, and one of which (concerning the Friedmann cosmological models) is badly wrong and could be seriously misleading for a student. In spite of these slips, the open style and lucid presentation generally make information retrieval easy and straightforward.

Superficially, *The Structure of the Universe* seems like a popular book. Its jacket begins with the pregnant query "Do black holes really exist?", and follows up with such imponderables as "what is a quasar really like?" In spite of this, black holes only occupy

two or three pages buried in the chapter on gravitation, and most of the discussion about this and other much-exposed topics in modern astronomy is explanatory rather than descriptive.

There is an unmistakable philosophical flavour running through the discussion, with the theme that local physics and global structure are somehow interwoven and that recent developments in both observational and theoretical astronomy are beginning to provide a tantalising glimpse of this link. This is an idea certain to appeal to non-specialist readers who are frequently intrigued by the concept of a grand design, but students would do well to temper enthusiasm for this speculation

with healthy scepticism, for much of the physics of the 'micro-macro' link such as the absorber theory of radiation and Mach's principle, is not universally accepted. I was a little disappointed that Professor Narlikar, for so long a spirited advocate of the steady-state theory, has not taken the opportunity to present an extended counterattack in its favour.

In summary, this is a nicely written, attractive book, including many useful, if somewhat superficial, discussions of basic modern astrophysics, from an author of international repute. □

*Paul Davies is Lecturer in Mathematics at King's College, University of London, UK.*

## Receptor research

*Methods in Receptor Research, Parts 1 and 2.* By M. Blecher. Pp. xiv+383 and 385-763. (Marcel Dekker: New York, 1976.) SFRs. 120 per part.

THESE two volumes have been designed to form a laboratory manual giving a more detailed description of methods used in receptor research than is commonly found in papers published in journals. In this aim, the editor and the 41 authors have succeeded. It was decided to omit the receptors for steroid and thyroid hormones because they have little in common with the polypeptide hormones, which take up most of the space. There are three chapters on gonadotropin receptors, three chapters dealing with glucagon receptors, three chapters covering insulin receptors, two chapters on prostaglandin receptors and one chapter each on  $\beta$ -adrenoceptor and on the receptors for acetylcholine, adrenocorticotropin, oxytocin, vasopressin, thyrotropin, parathormone, prolactin, cholera toxin, lectin and opiates. Each chapter is written by an expert in the field, describing the laboratory techniques in considerable detail. As with other treatises covering rapidly expanding areas of research, it could not be avoided that there are some notable absentees, as for instance the dopamine receptor and  $\alpha$ -adrenoceptor.

The editor stresses in his preface that the overlap between several chapters

is more apparent than real. The reviewer finds himself in agreement with this view because only too often seemingly contradictory results obtained by different laboratories are due to minor but important differences in the experimental techniques used.

It is not possible to deal with the various chapters, which are all well and clearly presented. The newcomer to the field of receptor research will find the detailed description of many well tried methods useful. In addition, there are two carefully considered discussions of a more general nature: Catt *et al.* deal with problems encountered in the determination of binding constants and of concentration of receptor, whereas De Meyts presents sections dealing with the physico-chemical parameters determining optimal steady-state binding and its quantitative analysis, the factors of importance for the study of the kinetics of hormone-receptor binding, and the cooperative interactions among receptor sites.

These well produced volumes will be essential for laboratories engaged in receptor research. Unfortunately, the high price will prevent their acquisition by many individual workers.

**H. W. Kosterlitz**

*H. W. Kosterlitz is Professor Emeritus of Pharmacology and now Director of the Unit for Research on Addictive Drugs, University of Aberdeen, UK.*