

reviews

Wealth of data on pulsars

S. Jocelyn Bell Burnell

Pulsars. By F. G. Smith. Pp. 239. (Cambridge University: Cambridge, London, New York and Melbourne, 1977.) £9.50.

THE tenth anniversary of the discovery of pulsars occurs later this year and at last the spate of papers seems to be slackening. It is a good time to produce a book on pulsars and we must be grateful to Professor Graham Smith for taking the trouble to do so. This book aims to be a summary and a review of the subject and is at a level suitable for research students in the field, or more senior scientists from other branches of astronomy who wish to have a reference book on the subject.

Its emphasis is mainly on the wealth of observational data that now exists on pulsars, with enough of the theoretical work included to give an idea of how well it all fits together. (It doesn't.) It describes phenomena rather than the theories which are current. There are some topics which the stranger to the subject might not expect to find in a book with this title—for example, several chapters on the interstellar medium, and some X-ray astronomy too. But they are rightly included. I have seen the contents page of another book on pulsars to be published later this year in the USA and it is very striking how similar both these books will be in the topics they choose to consider. Not only is it felt elsewhere too that the time is right to write this sort of book, but the scope of a book on pulsars is clearly determined by the state of the subject today.

The state of the subject is a mass, perhaps an embarrassment, of diverse observational results. The phenomena observed in pulsars are now well authenticated, although it is still hard to see whether differences are differences of degree or differences of kind. Our understanding as to why pulsars are as they are is much more restricted, and it could be some years hence before theoreticians solve some of the horrible problems presented by pulsars. Meanwhile, observers are anxious to find the critical experiments that should be made.

Although the pace has slackened, there have been some significant

developments over the past few years which the author deals with in a variety of ways. For example, the recent conclusion that there is an embarrassingly large number of pulsars to have been formed in supernova explosions gets mentioned a few pages from the end, but throughout most of the book the impression is given that this is undoubtedly the way neutron stars are formed. (In fact one general criticism is that sometimes Professor Smith makes what may be tentative conclusions sound too established.)

The sections on X-ray observations of neutron stars have suffered most. The whole subject is changing very rapidly; even while writing the book Professor Smith admits he had trouble keeping up with it! A couple of years later these sections look very sorry. It must be difficult to judge how and where to draw the line when writing a book containing such material, but one option is not to attempt to include it in any detail. A similar restraint has been necessary until recently on the

whole subject of pulsars.

One would like to recommend this book to a new research student but, although I warmly commend the radio astronomy (the greater part of the book), I would feel obliged to warn him that the X-ray and γ -ray sections are not to be relied upon as accurate accounts of the subjects. There are a number of misprints in the book as a whole which would drive a research student to exasperation, but sorting them out could be quite an educational process in itself. The index on occasion drove me to exasperation. (No Poincare sphere, Professor Smith!)

The book is very readable with an informal style; it is a welcome compendium of the work that has been done by radio astronomers on and with pulsars. Many of us will find it a useful book for ourselves or others to refer to. We have had to wait a long time for it. □

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Decade of the mouse

Development in Mammals. Vol. 1. Edited by Martin H. Johnson. Pp.386. (North-Holland: Amsterdam, New York and Oxford, 1977.) \$34.50.

Now that the genetic code has been not only cracked but put to work, the last major uncharted territories of biology are usually reckoned to be the brain and development. The earlier years of the century saw a series of classical experiments on the embryology of invertebrates—for example, sea-urchins and lower vertebrates, in particular amphibians. The past ten years have been the 'Decade of the Mouse'. A wide sweep of technical advances—biochemical, biophysical, microsurgical, and above all advances in the techniques of *in vitro* culture—have rendered the mammalian embryo accessible for the first time to sophisticated analysis. The rapid strides that have been and are being made in our understanding of mammalian development, at the level of mechanisms as well as description, render the field immensely exciting to those of us working in it.

It is therefore timely that a new review series, *Development in Mammals*, has been launched. The editor is Martin Johnson, well known for his personal contribution to our understanding of the immunology of early mammalian embryos; the first two volumes "will concentrate on consideration of peri-implantation embryogenesis and the maternal influences on the embryo".

Volume 1 contains an interesting mix of developmental biology and reproductive physiology, two disciplines that in the past, in spite of their obvious overlap, have had inadequate contact. Reproductive physiologists have concentrated on the female and the male, often forgetting that reproduction implies an embryo too; developmental biologists, because of their traditional pre-occupation with non-mammalian material, sometimes find it hard to come to grips with the endocrinological, physiological and anatomical complexities of the maternal-embryonic relationship in mammals. This volume should go far to bridge the gap.

The biochemical and biophysical as-