

Dynamic panorama of astronomy

Our Changing Universe: The New Astronomy. By John Gribbin. Pp. 160. (Macmillan: London, 1976.) £4.95.

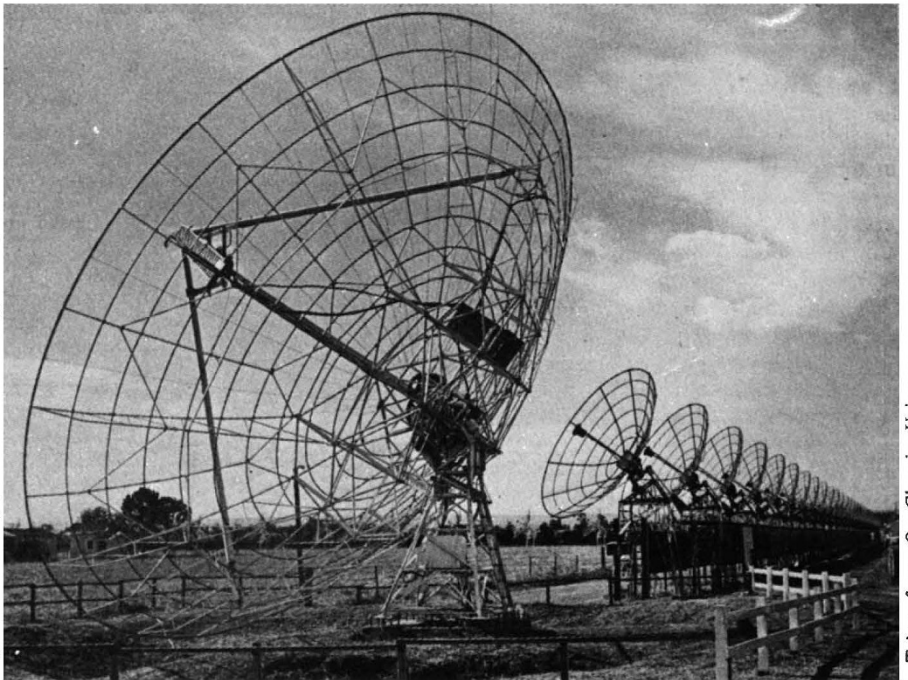
ASTRONOMY, in the doldrums thirty years ago, is now a thriving science, with a continuing march of discoveries that have transformed the static picture of past decades into an explosive and dynamic panorama. The immense changes in the science have been wrought by the development of the invisible astronomies that utilise observations in the non-visual ranges of the spectrum. Radio telescopes were the first to ruffle the calm waters of the optical astronomer, and these have been followed by X-ray satellites and a host of observation techniques based on the particle philosophy of modern physics. We now view a new universe, and one which Dr Gribbin sketches succinctly in his admirable book.

Beginning with radio astronomy, pulsars and quasars, we move on in a series of short chapters to cover the whole gamut of the modern scene—X-ray and neutrino astronomy, the significance of cosmic ray observations, the existence or otherwise of gravitational waves, the cosmic background radiation, and the question of whether the Universe is of the big bang, oscillating, or some altogether different type. In fourteen brief chapters covering some 66 pages of text, we have a brief but concise survey of the stellar and galactic universes.

There is also a chapter on the planets in the light of recent space probe observations, and another where Dr Gribbin gives his own views on what astronomy may be doing in the near future—a section where optical astronomy comes in for some comment. Finally there is an appendix, "Ice Ages, Man and Solar Neutrinos", in which there are some controversial ideas on a subject that is one of the author's consuming interests.

To concentrate most of the text on new observation techniques and their results was wise since they provide an ideal subject for a brief survey designed to be both relevant and exciting. The book is helped by a great number of well-chosen illustrations, some in colour, and all relevant to the text. There is an adequate index and a useful if restricted bibliography.

Of course, every reviewer is bound to have reservations on how an author apportions his space in a book of this kind—possibly more could have been said about BL Lacertae objects, on the electronic observing techniques now



Synthesis telescope, Fleurs Observatory, NSW, Australia.

Taken from *Our Changing Universe*.

used on optical telescopes, and at least a passing reference to that ingenious invention, the intensity interferometer—but there are bound to be personal preferences.

One wonders here and there about the level of previous knowledge expected of the reader: N-galaxies are mentioned but not specifically defined, spectroscopic principles are taken for granted, yet elsewhere the text could be understood even by a raw

beginner. Yet the general approach is such that no-one will get lost even though an equation appears as an integral part of one piece of descriptive writing. Every reader is bound to be swept along by Dr Gribbin's style, which is as dynamic as the universe he describes.

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Basic guide to the galaxies

Exploring the Galaxies. S. Mitton. Pp. 206. (Faber and Faber: London, 1976.) £4.75.

THERE are three main readerships for astronomy books: the professional astronomers, the amateur with a serious interest who makes his living elsewhere, and the more casual reader who has a passing (if sometimes quite deep) interest and wants to know the story of what is going on without being swamped by technicalities. Since it is rare that a book can cater satisfactorily for any two of these markets, let alone all three at once, it is well for an author to have his intended readership clearly in mind, and Mitton's *Exploring the Galaxies* is described on the cover as intended for the non-specialist, a "guided tour . . . which brings the reader to the threshold of contemporary research". So this is definitely not a book for the professional astronomer, who has already progressed beyond those fringes, and given its sober design

and the inclusion of diagrams of the kind familiar to readers of *Nature* (indeed, some culled from these pages) seemed therefore aimed at the 'serious' amateur, rather than the casual reader best hooked by pretty pictures. Unfortunately, the author has failed to distinguish clearly between these two markets, with the result that his text steers a sometimes uneasy course between superficiality and technicality, dropping anchor in neither port.

The book certainly starts simply, with a potted account of the history of astronomy—but it's not another account of this history that a prospective reader looks for in any new book on galaxies. Finding his feet with a chapter on instrumentation (but sadly dismissing X-ray telescopes in one paragraph) Mitton gets to grips with the basics of galaxies, their structure and the distances to them at a level which assumes some knowledge of physics, if only at the school rather than university level. At his best in describing recent work on giant radio sources, 'tadpole' radio galaxies and radio studies of QSOs Mitton falls down somewhat on the grounds of readability, producing such tortuous con-