scientists, not least because of some rather banal conclusions and because of the missed opportunity to discuss probably the most important two issues in current science — those of funding and quality control. Having said all that, the book is still worth a read; borrow a copy. — PAUL REES.


This book contains the invited review talks given at a NATO Advanced Science Institute held at Cambridge to mark the retirement of Professor Leon Mestel. The breadth of the subject matter included reflects that of Mestel’s contributions. Indeed, it is worth starting with Mestel’s own review, the last in the volume, which covers the following wide range of topics: magnetic fields and stellar structure; stellar magnetospheres, winds, and magnetic braking; magnetic fields and star formation; dynamos; the pulsar magnetosphere; and black-hole electrodynamics.

The invited reviews cover these and other areas where magnetic fields are important. Regarding solar-system objects, Moffatt gives an interesting account of the development of theories of the Earth’s dynamo, including present problems. Recent work on the heating of X-ray bright points in the solar corona by magnetic reconnection and on coronal heating by DC currents is reported by Priest, Parnell & Rickard and by Heyvaerts, respectively. There is increasing interest in heating from the relaxation of twisted and braided fields, particularly in the context of active-region loops.

Magnetic fields in stars are discussed in about half of the reviews. Concerning his attempts to obtain recognition of the important rôle of magnetic fields in star formation, Mestel says “For many years I felt rather like John the Baptist, a voice crying in the wilderness”. The topic is reviewed here by Zweibel. Magnetic fields are also important at the stage where young stars have accretion discs, winds, and jets (Tsinganos & Sauty) and in the evolution of cataclysmic variables (Spruit). Mestel includes dynamo-related fields in his review. However, the very strong fields that occur in neutron stars, magnetic white dwarfs, and Ap stars appear to be formed from ‘fossil’ fields (Landstreet; Meyer; Ruderman; Kahn & da Costa).

The articles in the second half of the volume are concerned mainly with measurements of magnetic fields (Davies; Wielebinski) and dynamo action in our own and other galaxies (Parker; Rees; Krause). The magnetic field in the early Galaxy and its importance in relation to galactic chemical evolution is discussed by Pagel. Finally, we are reminded that jets and magnetospheres are also important topics in the context of active galactic nuclei and black holes (Blandford).

Overall the volume succeeds in giving an authoritative overview of our present understanding of the complex behaviour of magnetic fields in a wide range of astrophysical objects and is recommended as a valuable reference work.

The Institute of Astronomy at Cambridge has published the contributed papers in a separate volume (price £7.50/$12; ISBN 0 952 00061 X), which is available from Mrs. Bridgeman at the IoA. Although some of the papers include reviews of earlier work, most are more detailed considerations of particular aspects of magnetic-field theory which can be only briefly described in the main reviews. It is well worth buying this companion volume. — CAROLE JORDAN.