reduce the errors to 0.01. The main purpose of the Supplement is to provide an improved ephemeris for Mars, and as a bonus the magnitudes of the five planets have been included. As a further check on Mars the authors compared DE102 with a later theory by Newcomb with corrections derived by Ross. The co-ordinates of Mars were supplied by Brian Emerson of the Royal Greenwich Observatory, and the agreement was close to 0.01 back to 601 BC.

Libraries which have the Tuckerman tables should now obtain a copy of the Supplement and I recommend that users make sure that they read the introduction to the Supplement.—B. D. YALLOP.


No better statement of the topic of this workshop proceedings could be given than its glossy frontispiece. It presents an isometric 3-D representation of a solar continuum radio burst with axes of intensity versus frequency and time over a 4-second interval. The plate looks like an aerial view of the Dolomites, made up of innumerable radio pinnacles and ridges less than 100 milliseconds wide. In the 29 contributions, the authors extol the beauty and meaning of this landscape from the standpoint of most of the techniques currently available to the solar explorer.

After an overview chapter, continuum fine structures are discussed in observational terms and in relation to their coronal environment. There then follows a lengthy chapter of articles on the relative timing of the radio spikes and manifestations at other wavelengths, in the typical fashion of the multi-band approach which has come to characterize solar transient studies since SMM. A single contribution on solar VLBI, though interesting, seems a little lonely in a section devoted to new technologies, but the final section on synchrotron emission covers a fair range of theoretical ideas.

Much of the material is not particularly new, having appeared in other reviews and in a special volume of solar physics. This book is therefore not a high priority for the general astronomical library, but as a permanent record of the highlights of an obviously stimulating workshop, it is certainly a useful addition to the shelves of the student of solar and stellar flares. It also constitutes a clear statement of the state of the art of solar plasma diagnosis at ever-increasing spatial and temporal resolution.—J. C. BROWN.


Interpretation of the wealth of observational data on quasars requires a wide knowledge of astrophysics. The large distances involved carry the requirement that, to examine the luminosity and spatial distribution of quasars, we need an understanding of cosmology. The large frequency range over which their continuous spectra are measurable, extending as it often does from radio to X-ray frequencies is best understood in terms of non-thermal processes involving, for example, the motion of relativistic electrons in magnetic fields. Interpretation of the emission-line spectra from the gas in the quasar environs involves the astrophysics of gaseous nebulae, which itself requires some knowledge of basic atomic physics. The list goes on.

All these topics, and more, are covered in Dan Weedman's comprehensive book. He sets the scene by describing the range of instruments, existing and projected, used to obtain information at all wavelengths on quasars, then discusses their uses in programmes to find quasars and to carry out detailed studies of them. Throughout the book the emphasis is on providing a range of concepts, and basic