These days, proceedings of symposia seem to be taking over from scholarly monographs as source texts for specialized subjects. This must be due in part to the increasing bureaucratic demands on time, and in part to the inflationary expansion of information beyond the event horizon of any single mortal. Unfortunately, such collections are frequently of limited use, lacking both coherence and lucidity, and consisting essentially of conference papers with an added token element of review material, or rehashes of other lectures. Advances in Solar System MHD is, on the whole, a refreshing exception to this pattern. While there are elements of rehashing, and while the chapters vary in originality and insight, the style is in the main lucid, didactic, and interesting. This success is attributable to the impressive list of lecturers assembled at the symposium on ‘Geophysical and Astrophysical MHD’, held in St. Andrews in April of 1990, on which the book is based. The titles of both book and symposium are slight misnomers, since the material covers planetary, magnetospheric, solar, and astrophysical applications. In addition, the material shows, in places, a welcome recognition of processes beyond the strictly MHD regime and contains some reference to observational material, though most chapters mirror their origins in the annual UK Applied Mathematicians conference. The following outline does not follow the chapter sequence, which is a shade arbitrary.

Priest opens with a standard introduction to the parameters, equations, regimes of validity, and areas of application of MHD, some of it duplicated in other chapters. The contexts there are sufficiently different for this repetition to be complementary rather than redundant, but use of a consistent system of units would have been welcome! Three chapters (Jones, Busse, and Fearn) address different aspects of dynamo theory and problems of planetary magnetism, that by Jones being the most accessible to the non-expert; while Saunders gives a largely non-mathematical, but perceptive, overview of the current state of knowledge of the Earth’s magnetosphere. Saunders’ chapter is the longest and the one which most warrants the inclusion of ‘Advances’ in the title of the book, giving numerous references to recent work besides that of the author himself. Problems of magnetic buoyancy, and their implications for the specific application of solar fluxtube emergence, are described by Hughes, while Démulin discusses the observed morphology, plasma parameters, and physical conditions in the solar prominences which are one manifestation of such emerged fluxtubes.

Mathematical fundamentals of magnetostatics and hydromagnetic equilibrium are covered by Amari and by Tsinganos, the latter with illustrations for hydromagnetic winds. Complementary chapters by Goossens and by Roberts address MHD wave theory in uniform and nonuniform media, their plasma heating effects, and solar applications.

Further down the path of complexity in wave phenomena lies the subject of MHD turbulence which is presented, in the context of the solar wind and wind heating, in an all-too-short but fascinating piece by Mangeney et al. General aspects of solar-flare MHD are treated by Hood, while magnetic reconnection in flares is dealt with by Jardine, with a rather trite treatment of the controversy over implications of numerical simulations for the reality of the Petschek mode. A short contribution by Hesse on recent developments in 3D reconnection, mainly in the magnetospheric context, complements these chapters. Finally,