left for discussion about the motivation behind the theory, or indeed about its application. As a result, students dipping into this book might find it difficult to see individual topics in context. This is a very functional book for those who have a clear idea of what they want to know, or who, while attending a lecture course, have been told what they ought to know. Its scope is limited to those topics that can be explained to students in the course of a lecture, and I was disappointed to see that some interesting subjects have been left out. For example, the section on MHD instabilities gives an excellent description of the tearing mode, but no other resistive instabilities, and there is no discussion of thermal instabilities. Most students, however, will be grateful for the careful pruning of material that has kept this book to a reasonable size and price, and will find it extremely useful. I expect that people in the research community will keep a copy on their shelves too, for all those times when they are forced back to basics.
— Moira Jardine.


This book celebrates the 50th anniversary (in 1993) of the opening of the Kippenheuer-Institut für Sonnenphysik, in Freiburg, and honours the retirement of its director, E. H. Schröter. Schröter held the directorship of this distinguished institute for research into the physics of the Sun from 1977, and is well known for his contributions to our understanding of solar activity. The conference from which the present volume arises brought together many of the world’s experts on solar magnetism, paying tribute jointly to Schröter and to half a century of solar physics in Freiburg.

The principal theme of solar activity is how sunspots are born, grow and interact with their surroundings, and ultimately decay. An understanding of this theme, central not only to the physics of the Sun but also the magnetic activity of sun-like stars, brings into play many diverse magnetohydrodynamical processes. It is necessary to understand fully the basic physics of a magnetic dynamo, whereby the magnetic field is manipulated and stretched in opposition to diffusive effects. Related to this is the evolution of elemental magnetic flux tubes as they rise from the base of the Sun’s convection zone to emerge 200 Mm above and then interact with the overlying magnetic field of the chromosphere and corona, thereby producing the ‘fireworks’ (flares, coronal mass events, X-ray bright points, etc.) that characterize the solar atmosphere. Linked closely with these processes and requiring a detailed, largely computational, examination is the question of the nature of compressible convection both within a magnetic field and in its absence. The study of each of these topics is either in its infancy or has been subjected to considerable re-thinking in recent years, not least because of the wealth of observational data that the Sun provides. Seismological input, though very much at a preliminary stage as far as sunspots are concerned, offers one new and exciting means of understanding the basic nature of sunspots.

Each aspect of this basic problem in plasma astrophysics is explored extensively by invited reviewers and contributed papers. A laudation of E. H. Schröter’s scientific life is presented by H. H. Voigt. The editors are to be congratulated on the surveys they have selected; certainly this volume is a basic addition to the bookshelf of anyone interested in the Sun’s magnetism.
— Bernard Roberts.