The Analysis of Starlight

Reviewed by David Allen

I rate this book nine out of ten. Students of my usually critical book reviews will recognise this as high praise, and indeed I read the book avidly, despite its length, and enjoyed it. It is a book I shall dip into for many years to come.

John Hearnshaw subtitled his monograph *one hundred and fifty years of astronomical spectroscopy*, which is much more informative than the principal title. The 150 years in question is deemed to begin with Fraunhofer's analysis of sunlight, though the author admits that it might just as well be a 300-year history beginning in 1666 with Newton's dispersion of sunlight through a prism. The period is defined more precisely by the closing date of 1965, chosen somewhat arbitrarily to mark the culmination of the era of classical stellar spectroscopy, and before the introduction of digital detectors opened up new fields of optical astronomy.

In 1967 I began as a research student at the Cambridge Observatories. I found myself in one of the bastions of stellar spectroscopy, surrounded by pundits who spoke of fine analyses, curves of growth, microturbulence, Voigt profiles, and spectral synthesis. Backed by a century of intensive work on the physics and chemistry of stars, still proud in the memory of that giant of the scene, Arthur Eddington, Cambridge was a frightening place to enter. The walls of its splendid library were lined with books, journals and theses, sufficient to bring the tyro right to the forefront of this demanding science. But to me they were daunting. How many years, I wondered, would it take to absorb all this material, to understand it in sufficient depth that I could make the slightest impression at all on the science? I took the coward's way out and turned to infrared astronomy. A great many of my generation forged their paths through radio, infrared, ultraviolet or X-ray astronomy, or turned their attentions to interacting binaries, solar system studies or extragalactic astronomy. For those people, just as for me, Hearnshaw has written this book.

I rather think, too, that even the diehard stellar spectroscopists will enjoy reading the volume. It is a nicely written history, which encompasses more information than most experts will readily recall, and which has the added bonus of a wealth of references. Each chapter ends with a reference list, and if I ignore the fact that a few publications will appear more than once, I count over 1600 of them! Add to this a pretty good (though not perfect) general index, plus separate indexes to people, stars by name, and major spectral lines, and you have a valuable resource indeed. In the introduction Hearnshaw wrote 'I have aimed at writing for the practising astronomer what is essentially an interpreted guide to the literature covering the development of observational stellar spectroscopy.' In this he succeeded admirably. The book is nicely produced, well illustrated, competently proof-read, and fascinating.

The trouble with the book is its length. There is one devil of a lot of reading in it, sufficient to deter the majority of practising astronomers who believe they know all they need to about the subject. There is a danger, sadly, of the book being read only by those chosen few who are asked to review it, if indeed by them! I encourage a wider reading. 'I know of several [review papers] by distinguished authors with erroneous facts in the historical introductions; I trust that the readers of this book will not perpetuate such mistakes,' writes Hearnshaw. Certainly the book corrected a few misconceptions I have carried awhile, and I doubt that I would be unique in that regard.

It is, of course, the length that is responsible for the volume's most essential flaw. It is too large a work to be robust in paperback. Yes, I know that book prices are rising, but surely any potential purchasers will be put off by the first digit after the $ sign.

Get you library to buy a copy, and make sure you read it.

Astrophysics of Brown Dwarfs

Reviewed by M. S. Bessell

The discovery of the first 'brown dwarf' VB8B by McCarthy using IR speckle techniques at KPNO in 1985 was followed by press conferences, and private and semi-public acrimony over whether this or photographic astrometry from Flagstaff over the preceding years had precedence for the 'discovery'. Great interest in brown dwarfs was rekindled throughout the world and this conference organised at which the pundits could display their wares. The fact that the 'discovery' has since been withdrawn, and VB8B no longer exists does not detract from this book, and I recommend it as an excellent review of observational and theoretical knowledge of 'brown dwarfs', those tantalizing objects which bridge the range of masses between conventional planets and normal stars. Three excellent indexes are provided for subjects, star-names and cross references, and astronomers names.