

ample, on p. 471 it is stated that in the U Geminorum-type stars it is the primary, red, component whose spasmodic eruptions give rise to variability, even though Smak's classic 1971 analysis of U Gem itself proved that the secondary, blue, component was the seat of its outbursts). Ultimately, it is the superficial treatment given to the physics of stellar structure and evolution, mass loss, and mass accretion—issues central to the evolutionary problem—that most seriously hampers the discussion. Mechanical considerations alone impose only very broad constraints.

Notwithstanding these misgivings about the final chapter, the worth of Kopal's book lies in its account of the dynamical problems. The very severity of its classical approach to them will insure that it occupies an important place in the literature for years to come. There is a liberal sprinkling of typographical errors throughout the book, and it does perpetuate the so-called Roche coordinate system, which does not exist for the general Roche problem according to Papaloizou and Pringle. But the treatment of dynamics is basically sound, and it is useful to have Kopal's broad contributions to the subject assembled in a coherent account.

Heintz's *Double Stars* is billed as a revised translation of its earlier German edition, *Doppelsterne* (Goldmann, Munich, 1971), incorporating literature up to late 1976. However, large portions of the text have been not only rewritten but rethought.

This slender, unpretentious volume fills a crying need for a contemporary account of the binary star phenomenon. The only comparable account of the subject is the very valuable one by Batten, *Binary and Multiple Systems of Stars* (Pergamon, 1973), now somewhat outdated as a result of the enormous progress that has been made both theoretically and observationally since its publication, and particularly the growth of interest in late stages of binary evolution. Given the delays inherent in any book's finding its way into print, Heintz has done a superlative job of reflecting the state of the art, ranging far more broadly than any of his predecessors and conveying both a sense of the important problems yet unsolved and the flavor of current research.

Double Stars is roughly evenly divided between discussion of visual binaries and of close (spectroscopic and eclipsing) binaries. Broadly speaking, the author's outlook is an observational one, which is to say that theoretical conjectures are fitted to an observational

context, rather than vice versa. The progression throughout the book is generally toward more and more exotic phenomena, the treatment culminating in a thumbnail sketch of our knowledge of x-ray binaries (such as it was two years ago). The size of the book does not permit any subject to be discussed in much depth, so individuals may quibble whether one or another subject should have received more attention. But the virtue of the book is that the discussion is balanced in depth and quality, an impressive achievement considering the enormous variety of subjects covered, from historical observations of visual binaries and the determination of their orbits to mass transfer, novae, and x-ray binaries. Heintz shows a sure sense of what contributions have been pivotal and presents an enormous amount of information in a very accessible, concise form.

Double Stars is a very welcome addition to the literature of the subject and an outstanding vehicle for introducing it to advanced undergraduates or graduate students. It deserves a place on the shelf of every serious student of binary systems.

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