to the discovery of pulsars by Jocelyn Bell). The binary pulsar is mentioned as a test of General Relativity, and X-ray bursters also get a mention. The third chapter discusses stellar-mass black holes and gravitational radiation. Van Horn was present at the historic event where the positive *LIGO* results were announced and gives a graphic account of the excitement. The final three chapters cover stars with special characteristics — pulsating stars, cataclysmic variables, and the first stars.

There are six appendices expanding on some topics, such as electron degeneracy and *LIGO,* plus an extensive bibliography as well as relevant references at the end of each chapter. I had a few gripes. Firstly, I dislike page numbering by chapter (1-1, 1-2 *etc.*), so that it is laborious to find out how many pages the book contains (I have not checked the number claimed by the *Magazine*'s Editor [who crudely adds the numbers given in the list of chapters — Ed.]). More seriously, there is no general index, so one has to rely on the List of Contents to see whether any particular topic is covered. If you wanted to find out whether a particular astronomer gets a mention, you would have to guess which chapter he or she might be in. A list of illustrations would help with that, but there isn't one. I hope that if there is a second edition the publisher might deal with those points.

In summary, then, a very comprehensive and attractively written account of stellar structure and evolution, let down slightly by editorial deficiencies. I would still recommend it warmly for those wanting to know the details of what goes on inside stars. It covers advanced material at a level that would be useful for final-year physics undergraduates and beginning graduate students in astronomy, but it is written in a style suitable for less-advanced students. Members of many astronomical societies would appreciate it. But beware: it weighs 872 g! — Robert Connon Smith.

Physics of Binary Star Evolution. From Stars to X-ray Binaries and Gravitational Wave Sources, by Thomas M. Tauris & Edward P. J. van den Heuvel (Princeton University Press), 2023. Pp. 852, 23·5 × 15·5 cm. Price £80/$95 (paperback; ISBN 978 0 691 17908 7).

The evolution of binary-star systems sounds like one of those dull but worthy fields worked arduously by the older and more-bearded members of a typical university astrophysics department. This is wrong to the point of mendacity. The evolution of binary systems depends on juicy physics and leads to some of the weirdest and most wonderful objects within astrophysics, including cataclysmic variables, X-ray binaries, multiple types of supernova, millisecond pulsars, gamma-ray bursts, and the progenitors of gravitational-wave events.

Due to the variety and complex interrelations between many of these objects, the research in this area can be a bit compartmentalized and difficult to develop an intuitive feel for. This is perfect territory for a hefty textbook where the many threads can be pulled together into a coherent overview of the subject. Such a textbook requires extensive knowledge and understanding from the authors, the space to cover all relevant points, clear writing that engages the reader, and careful organization to aid their understanding. Tauris & van den Heuvel have produced exactly this textbook; it is a masterpiece.

The book begins with a brief but informative review of history of the many types of binary star (astrometric, spectroscopic, eclipsing, cataclysmic variables, X-ray binaries, supernovae, and others). Celestial mechanics gets the same treatment, followed by the Roche model, mass transfer, tides, accretion discs, common envelopes, white-dwarf binaries (both wide and close), and more. The bulk of the book is dedicated to the ménage of X-ray binaries, as might

be predicted by those familiar with the research interests of the authors. Topics covered include LMXBs, IMXBs, HMXBs, and ULXs, and the discussion begins with the observational viewpoint before moving on to the theoretical framework. A clear description of the evolution of single stars follows, and then is extended to cover the evolution of stars in binary systems. The final chapters concern interacting binaries in globular clusters, supernovae, binary and millisecond pulsars, gravitational-wave events, and binary-population synthesis. More detailed treatments of some of these concepts are available elsewhere, but Tauris & van den Heuvel cover a huge amount in one place. It goes well beyond what a typical 'binary stars' module would cover at the undergraduate level, and will be useful for anyone undertaking research in this area from PhD students onwards.

The writing style throughout is clear and easy to read, which is impressive given the material covered. There are many diagrams, illustrating both physical concepts and observational data, and a good number of pretty pictures. Colour is present in those pictures and in the majority of the diagrams. Careful attention is paid to tracing the evolutionary pathways of binary systems, which can otherwise be hard to tease from other sources. A fair number of exercises are given at the end of many of the chapters, with (extremely brief) answers in an appendix. The book is also produced to a high standard, and I did not find any grammatical or typographical errors. Tauris & van den Heuvel's book has immediately become the standard text in this science area and I recommend it unreservedly. — John Southworth.

Astronomy of Ancient Egypt: A Cultural Perspective, by Juan Antonio Belmonte & José Lull (Springer), 2023. Pp. 588, 21·5 × 15 cm. Price £129·99 (hardbound; ISBN 978 3 031 11828 9).

In 1969, the great historian of science, Otto Neugebauer, wrote: "Astronomy played a uniformly insignificant role in all periods of Egyptian history." And the present authors tell us: "However, there is not a single explicit or obvious reference to any lunar or solar eclipse in the entire history of Pharonic Egypt" (with the possible exception of a 610 BC* event). That remark occurs on page 516, leaving one to wonder what the previous 515 pages have been about.

The last, seventh, chapter deals with astronomy and chronology. It is followed by a generous glossary, a long list of works consulted, and a moderate index. But the chronological issues are real. When, for instance, did Khufu (Cheops) of the Fourth Dynasty build his pyramid (the biggest one)? Table 7.1 presents three chronologies from earlier authors in which Cheops' dates are 2554–2531 BC, 2589–2566 BC, and 2509–2482 BC, not even overlapping, and Belmonte and Lull tell us that all three are wrong.

By the time of the much-romanticized 18th Dynasty, the various numbers are at least overlapping, and the authors defend a chronology that puts Tutankamun's nine-year reign in 1322–1314 BC†. But numbers from all the authorities do not entirely converge until we reach the reign of 25th dynasty Pharaoh Taharqa, 690–664 BC, when Egyptian and chronologies from other civilizations can be synchronized.

*The Managing Editor and I have previously disagreed about the proper abbreviation for years long ago. I have a strong preference for CE (Common Era) and BCE (Before Common Era). The present authors, however, use AD and BC and are entitled to their insensitive choice.

†Zahi Hawass, in *Tutankhamen: Treasures of the Golden Pharaoh* (IMG Melchior, New York), 2018, chooses 1336–1327 BC in a volume that came with the higher-priced tickets to a presentation in San Diego in spring 2013, part of his national fund-raising tour. He also declared during the book-signing event that "Badawy was a genius", a point to which I shall return.