

BOWEN (A.C.) and ROCHBERG (F.) (eds) **Hellenistic Astronomy: The Science in Its Contexts** (Brill's Companions in Classical Studies). Leiden: Brill, 2020. Pp. xxii + 751. \$236. 9789004243361.

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This is a work which very much lives up to its subheading, *The Science in Its Contexts*. We have here 40 essays from leading scholars in their fields and an introduction from the editors, Alan Bowen and Francesca Rochberg. The book is divided into three main parts, (A) Technical Requirements, (B) Observations, Instruments and Issues, and (C) Contexts. The theme of the context of Hellenistic astronomy runs throughout. Hellenistic astronomy has often been considered to be one of the major achievements of ancient science, applying sophisticated mathematics to a wealth of observations to generate a precise science of the heavens. There have been many technical studies, but much less work has been done on the context of this astronomy, so this book fills a significant lacuna.

The book begins with a 'Prolegomena to the Study of Hellenistic Astronomy' (Bowen and Rochberg). This is excellent in introducing the structure of the book to the readers and orientating them in the key issues relating to the study of Hellenistic astronomy.

While focussing on the context of Hellenistic astronomy, this book does not neglect the technical and philosophical issues, which are dealt with very well in the first section. This begins with pieces on the celestial sphere and methods of reckoning time (Montelle, Hannah). This section also deals with quantitative tools, techniques for measurement and computation, and the geometrical background of planar and spherical trigonometry (Ossendrijver, Van Brummelen). The theories of the sun, moon, planets and eclipses are also ably addressed (Montelle). It is good to see here pieces on Babylonian planetary theory (Sidoli), how the Babylonians contributed to Graeco-Roman Hellenistic theory and contemporary Egyptian theories (Ossendrijver, Rochberg, Ross), as well as on hypotheses in Graeco-Roman astronomy (Bowen) and the Ptolemaic planetary hypotheses (Evans).

The second section of the book deals with observation and instruments. It starts with the observational foundations of Babylonian astronomy (Brack-Bernsen) and moves on to the Hellenistic period (Kremer) and Ptolemy (Duke), with pieces on surveying instruments (Rihll), maps (Geus) and star lists (Grasshof). The pieces on instruments are of particular interest as it is important to know what instruments were available, how they were used and what their context was. This section also deals with some thematic questions, addressing issues in Hellenistic Egyptian and Graeco-Roman texts (Spalinger, Bowen), as well as the aims and texts of Babylonian astronomy (Hunger). The latter piece is of special interest as there have been many technical discussions of the Babylonians, but fewer studies on the nature of the Babylonian astronomical texts or what the aims of Babylonian astronomy were.

The third section deals specifically with the contexts of Hellenistic astronomy and here we have a very interesting and diverse selection of pieces. The stand-alone piece on the work of the professional *astrologos* is of particular interest and importance (Hubner). There is a subsection on Hellenistic astronomy in public service, where the Antikythera mechanism is treated in a balanced and factual manner, in contrast to some studies which have overestimated its importance and accuracy (Hannah, Evans, Greenbaum). There is also an interesting subsection on Hellenistic astronomy in literature (Mastorakou, Schmid, von Lieven, Ossendrijver). The substantial section on divination and natal astrology is very welcome. Whatever the relation between astrology and astronomy now, it was clearly very different and very much more interesting in the Hellenistic period. This needs to be recognized in order to understand Hellenistic astronomy properly and here we have four excellent pieces on divination and horoscopes (Greenbaum, Rochberg, Heilen, Ross). The book closes with a section on the theological contexts. Here it is good to see a wide variety of

astronomy-related topics being discussed in relation to a broad span of theological views (VanderKam, Jacobus, Lewis, Bhayro, Wildberg, Cambiano, Wilberding).

However, it would also have been good to see something on the theologies of Plato and Aristotle as an important context for Hellenistic astronomy. It is also noticeable that there is little on cosmology in this book, where earlier Greek cosmology, again notably that of Plato and Aristotle, forms an important context. It is good to look at other contexts of divination, astrology, medicine and public service but the book would be a more comprehensive companion with a little more on the Greek philosophical underpinnings.

There is a very useful glossary of terms for Hellenistic astronomy, an extensive bibliography and comprehensive indices of passages, names and subjects. There are some useful illustrations. All this contributes to making this book both informative and user-friendly.

Overall, this book is a major and welcome contribution to the literature on Hellenistic astronomy. It provides an authoritative set of chapters by leading scholars ranging over a very wide set of contexts and cultures. It is up-to-date in its historiography, it does not shy away from difficult or controversial topics and provides well-balanced, informative discussions. While its size and price will deter its purchase by any other than specialists, it will be an important reference work for scholars and postgraduate researchers for many years to come.

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DE ROMANIS (F.) **The Indo-Roman Pepper Trade and the Muziris Papyrus** (Oxford Studies on the Roman Economy). Oxford: Oxford University Press, 2020. Pp. xxiv + 381, illustrations, facsimiles, maps. £85. 9780198842347  
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Interest in the ancient Indian Ocean trade has grown over the last few decades. A significant driver behind this has been the greater availability of evidence resulting from recent archaeological work at a range of international sites, coupled with a raft of new epigraphic, papyrological and numismatic material. In this work, Federico De Romanis fruitfully draws upon this floruit of scholarship and newly available evidence to offer a valuable contribution to the study of Roman–South Asian trade links (these links forming part of a wider nexus connecting the western Indian Ocean region).

Unsurprisingly, this book devotes considerable space to analysing the so-called Muziris Papyrus, a document acquired by the Austrian National Library in 1980. The papyrus contains texts on its recto and verso, although unfortunately it is lacunose. These texts were written in different hands, but likely connect to a single trade venture sometime in the mid-second century AD. The recto contains details about a loan relating to goods acquired from Muziris (a port on the Malabar Coast) and stipulates arrangements concerning their transport from one of the Red Sea ports to Koptos, then Alexandria. The verso details the assessment of customs dues (notably a quarter tax or *tetartē*) on this Indian cargo, which had been transported by a ship called the Hermapollon. Some of the information, particularly on the verso, is quite technical, a point that De Romanis lays out clearly in the introductory synopsis. As such, there have been varied interpretations of both sides of the document since it came to light, including whether the recto represents a loan taken out in Alexandria to fund a trading venture to Muziris, or a supplementary (or superseding) contract on return to one of the Red Sea ports (see, among others, H. Harrauer and P. Sijpesteijn, 'Ein neues Dokument zu Roms Indienhandel. *P. Vindob. G 40822*', *AnzWien* 122 (1985), 124–55; L. Casson, 'New Light on