

cient and Neolithic representations of the sky in Europe, across Siberia and into central Asia. Rather than make assertions about cultures which are now lost, she uses the material to discuss the options and asks how we can make interpretations. For example, she points out that some sky myths which probably pre-date the Neolithic are interpreted through activities "... that hardly develop before the Neolithic ..." (page 186).

David Pankenier fluently summarises three millennia of Chinese preoccupation with the skyscape, providing a very handy summary of a huge span of history. Pankenier also stresses the role of the sky in Chinese politics, in which the emperors required a mandate from heaven in order to rule. As he writes,

Heaven's Mandate refers to the ancient doctrine that the right to rule is contingent on the virtuous performance of the sovereign function of keeping the temporal order harmonised with the cosmos, ostensibly for the benefit of the people. (page 216).

Sky and Earth, planets and people are therefore part of a single society.

Of the two technological chapters, Georg Zotti, of the Ludwig Boltzmann Institute for Archaeological Precision and Virtual Archaeology, who is well known for his work on the Stellarium software, discusses the content, function and limitations of 3-D modelling of the skyscape. He is optimistic that the challenge can be met by refining the relevant programming. The final chapter by co-editor Daniel Brown of Nottingham Trent University, along with Deborah Harty, Amanda Reyes Asturias, Kieran Simcox and Philip Johnson, explores the science of how we see things with reference both to Plato and Aristotle's theories of time (the authors suggest Plato denied that the 'now' exists, whereas Aristotle allowed for it). In an inspiring and erudite contribution, the authors apply the phenomenological experience of time and space, memory and consciousness, to the construction of photographic images of a site, including abstract representations of the skyscape derived from photography, taking us from the Stone Age into the twenty-first century.

In Chapter 10 Jarita Holbrook of the University of the Western Cape, and the School of Social and Political Science at the University of Edinburgh, discusses the Square Kilometre Array art exhibition in Australia and South Africa, skilfully combining debates about technology and the arts, and modern astrophysics and indigenous world views, encompassing many of the themes found elsewhere in the book.

The volume closes with an Afterword by

Andrew Newsam which stresses the importance of studying the skyscape, as opposed to simply the sky, along with the importance of public engagement, citing as an example the social media campaign around the Rosetta spacecraft.

This book is a major academic contribution to our understanding of human engagement with the sky and is aimed at establishing the importance of the topic within higher education. But it is also concerned with outreach and Newsam's point, that such material can contribute to public engagement with an understanding of the sky, is an important one.

It is a delight to read a book in this field which steps back from making grand claims or definite conclusions and instead acknowledges the provisional nature of all knowledge. In this sense the book pays due respect to the Humanities, but this makes it all the more important reading for those with a science background. The editors are to be highly commended for their work, and the individual authors for the quality of their research.

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***The Values of Nighttime in Classical Antiquity: Between Dusk and Dawn*, by James Ker and Antje Wessels. (Leiden, Brill, 2020). Pp. ix + 359. ISBN 978-90-04-43557-5 (hardback), 160 × 240 mm, US\$136.**

For six decades Brill has been publishing the so-called Mnemosyne Supplements, which cover all aspects of the ancient world: this is Volume 434 in the series! For the past five years a new volume has appeared monthly. The editors of this book are James Ker (Associate Professor of Classical Studies at the University of Pennsylvania) and Antje Wessels (Professor of Latin Language and Literature at Leiden).

Many different aspects of nighttime are covered in the book, with topics by the 15 authors dealing with such things as Hippocratic medicine and nocturnal military activities. I will concentrate in this review of matters touching on astronomy. The most direct engagement is by Kathryn Wilson (Washington University in St. Louis), who writes on "The Astronomer Poet at Night".

Wilson writes,

Night can be illuminating; it can be baffling; it can reflect the entire range of emotions we feel about the wider cosmos we inhabit

and how we put those feelings into poetry. (page 131).

She examines three poems: Aratus' *Phaenomena* (from the 270s BCE), an epigram about Aratus by Callimachus, and *Astronomica* by Manilius.

"The *Phaenomena* is a poem that takes place at night ..." and explores the process of finding both astronomical and meteorological signs. (page 135). While Aratus offers no insight into how he spent his nights, astronomical observations made by others are depicted.

While the nighttime is widely regarded in modern Western culture as a time of danger, "Aratus sees Night as a beneficent force in our lives, repeatedly stressing her good will in the signs she provides." Aratus believed "Night is your first guide to finding the signs that Zeus has created for us." (page 137)

For Aratus, the most notable aspect of the Night was what we call the Milky Way, but how he views it gives us an astonishing insight into ancient Greek cosmological thought:

Aratus connects the whiteness of the band of stars specifically to the act of seeing. They are eyes looking down, just as we look up at them ... Night both illuminates the stars and draws us out to look at them. She is the binding force in this symbiotic relationship between the cosmos, which provides signs, and humans, who need to look for those signs. (page 138).

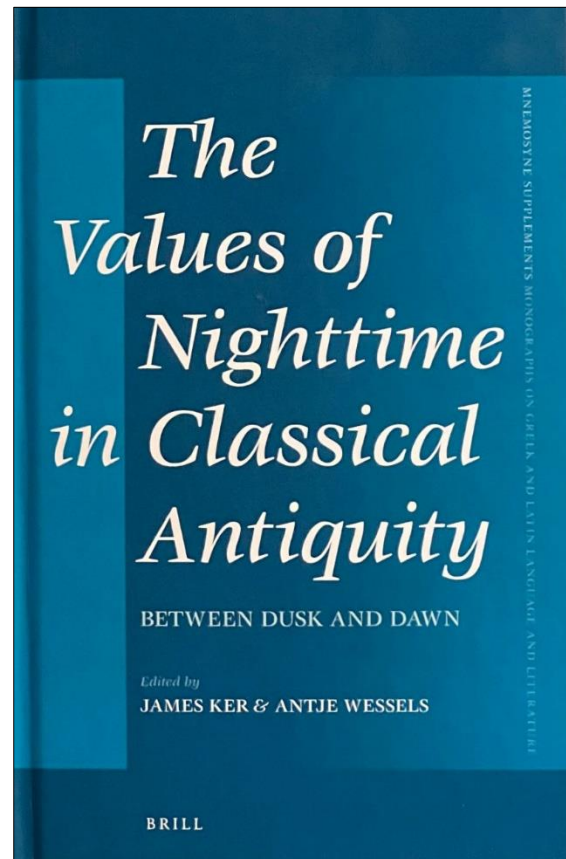
The epigram of Callimachus, who died in the same year of 240 BCE as Aratus, holds hidden depths. Crucially, her interpretation of the poem upends existing scholarship and provides a platform for a study of "... the use of nocturnal time in astronomical poetry." (page 131). The epigram became a central part of Roman poets' engagement with Aratus, writes Wilson, is such a way that the primary nocturnal activity of poets for the first time came to be associated not with sleep, but with the creation of poetry: "It is Callimachus' way of making Aratus' astronomy an aesthetic enterprise." (page 133).

Some 280 years after Aratus, Manilius uses the Milky Way as a metaphor for the *Phaenomena*. Manilius likens the Milky Way to a path through the field, which has become a track worn away by constant dragging. This is a sly poetic way of admitting that numerous translations of the *Phaenomena* had already been published, but yet his own *Astronomica* exhibited originality. Manilius "... notably changes one major thing: the agency that draws our gaze. No longer does Night herself display the stars for us, but instead, the Milky Way now compels us to look." (page 145). A

fascinating analysis by Wilson, and one that repays close study.

The concept of night in early Greek thought can be found in *Works and Days* by Herodotus, around 700 BCE. He includes innumerable references to the stars as temporal markers. Adrienne Atkins (University of Pennsylvania), describes it beautifully. The stars, she writes, provide

... a heavenly point of reference, a means by which human life can be anchored to the divine framework of the cosmos. Despite its literal obscurity, the night provides a cosmic clarity. (page 25)



Radcliffe Edmonds III (Bryn Mawr College) tackles the complex nature of Orphic cosmologies, and provides an important reset to the entire study. "There was no Orph-ism," he declares (page 47). He counters modern scholars who

... have reconstructed the fragments of cosmogonies attributed to Orpheus, but their attempts to unify the fragments have led to distortions that suppress the variety of deviating models that appear in the evidence. (page 47).

Establishing a new paradigm, he regards "... each of these cosmogonies as the product of bricolage, that is, creative reworking of the tale using different pieces of the mythic tradition." (page 47).

Edmonds particularly examines the role of Time. Different cosmologies had their own ideas of the *arché*: what came first? The last head of the Platonic Academy, Damascius, is our source for many of the Orphic myths. In the standard account of the Orphic Rhapsodies (dating from second or third centuries CE) that he relates, Time is the *arché*. “Night becomes an agent of Time, alternating with Day to mark the temporal motion of the cosmos.” (page 61). However, the earliest texts relating Orphic cosmology attributes Night as the *arché*, while others give Chaos as the *arché*. The study of this is not just confined to those interested in ancient cosmology. The great play by Aristophanes, the *Birds*, assumes the audience is well familiar with the forces of Chaos and Night, which brings forth the cosmic egg that produces the race of birds. Thus, even literary scholars must become cosmologists to properly analyse the ancient Greek theatre.

Albert Joosse writes on philosophical qualities of night according to Plato, who notes the succession of day is necessary for human understanding and appreciation of cosmic order:

This is because night and day are at the origin of our notion of number. And the notion of number allows us to acquire knowledge of mathematics and ultimately even of philosophy. (page 95).

Joosse looks at both *Timaeus* and the *Laws* as sources to discern Plato's attitude towards the night. He concludes that while “Things can become clearer at night than they would ever be in daylight ...” Plato also warns that one must be philosophically advanced “... to be immune to the night's dangers.” (page 110). Kim Beerden (Leiden University) briefly looks at these dangers as she quotes Cicero on nocturnal divinatory signs: “Then indeed during the night various terrible forms were seen and warned of war and sedition.” (page 260). It forms part of a passage Beerden considers, where Cicero describes a lunar eclipse and what may be a description of the aurora borealis.

The book contains 2 typos: Enlightenment is spelled wrong on page 8; “in connected” should be “is connected” on page 146. Each chapter concludes with its own bibliography. In addition to an index of names and subjects, there is a very welcome ‘index locorum’ that allows one to find the pages on which passages are quoted from the ancient sources.

As the first book to apply modern scholarship to bear on the subject of the Night in Classical antiquity, this is an invaluable re-

source and a fine corrective to previously misguided research.

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“Pour la gloire de M.de la Lande”. Une Histoire Matérielle, Scientifique, Institutionnelle et Humaine de la Connaissance des Temps, de 1679 à 1920, by Guy Boistel. (Paris, Institut de Mécanique Céleste et de Calcul des Éphémérides (IMCCE), Paris Observatory, 2022). Pp. 692 pages. ISBN 978-2-910015-87-9. E-book, free PDF version: https://www.imcce.fr/content/medias/publications/ouvrages-pour-tous/Boistel_LaLande_eBook.pdf. The printed version, with coloured figures, costs 72 €, and can be ordered here: <https://www.bod.fr/librairie/pour-la-gloire-de-m-de-la-lande-guy-boistel-9782910015879>

Connaissance des Temps (hereafter *CdT*) is the oldest astronomical/nautical ephemeris published without interruption up to the present day. It preceded by a century the English *Nautical Almanac* (from 1766) and the Spanish *Almanaque Nautico* (from 1791). It descended directly from Kepler's astronomical ephemerides assembled from 1629, based on his *Tabulae Rudolphinae* of 1627, and the intermediary tables by Kepler's pupil, Johann Hecker (1625–1675), published in Gdansk. These tables, in Uraniborg mean time, were translated into French from 1666. After an aborted project by Huygens in 1666, the *CdT* was created in 1679 by Joachim Dalencé (ca. 1630–1707) with the help of Jean Picard (1620–1682). Jean Le Fèvre (ca. 1650–1706) succeeded Dalencé, and in 1701 the journal became an official publication of the *Académie Royale des Sciences*. Aside from ephemerides, it contained more and more material as *Additions*, which became official after 1703. These *Additions* are very interesting as they give an overview of the state of astronomy in France and in Europe.

In 1759, the young Lalande (1732–1807) took over the editing of the *CdT*, which he renovated deeply, introducing tables for the sailors, in particular those to calculate lunar distances produced after the issue for 1761, using the theory of Tobias Mayer rather than that of Clairaut. He was helped by various calculators under the supervision of Nicole-Reine Lepaute (1723–1788). Thanks to his good relations with the editor of *Nautical Almanac*, the Astronomer Royal Nevil Maskelyne (1732–1811) who could benefit from seven or eight calculators,