

quality from which readers can select the items that take their fancy with no expectation that anyone will attempt to gorge on everything on offer.

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Advancing Cultural Astronomy: Studies in Honour of Clive Ruggles, edited by Efrosyni Boutsikas, Stephen C. McCluskey, and John Steele. (Cham, Springer Nature, 2021). Pp. x + 319. ISBN 978-3030646059 (hardback), 157 × 240 mm. US\$149.99

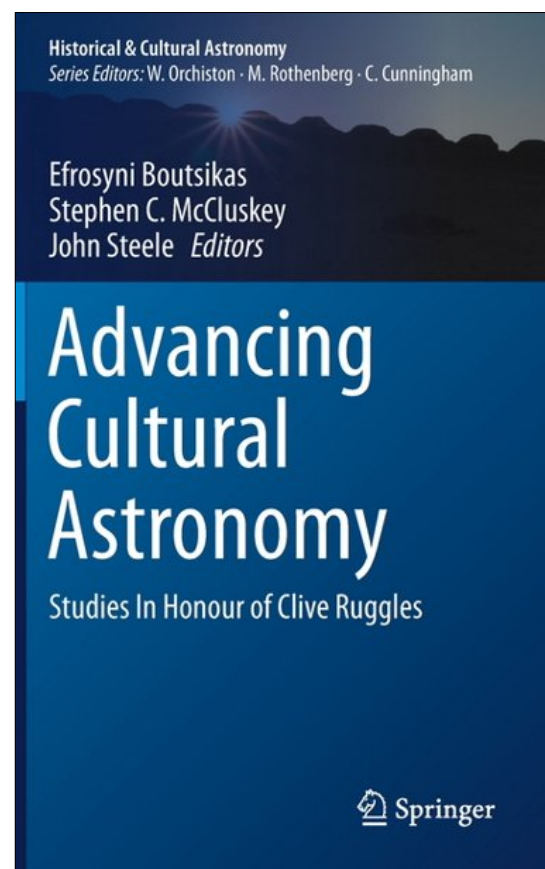
Although the scope of this volume falls mainly under what has traditionally been called archaeoastronomy, the term “cultural astronomy” in the title is meant to convey both a broader area of study and the fact that one of the guiding principles of archaeoastronomy these days is to place its work in cultural context.

As a Festschrift for Clive Ruggles, the Emeritus Professor of Archaeoastronomy at Leicester University, the goal of the volume is not to be comprehensive, a feat that would be impossible in any case with the rapidly expanding literature on the subject. For efforts in that direction readers may wish to see Ruggles’ own *Handbook of Archaeoastronomy and Ethno-astronomy* (Ruggles, 2015), Giulio Magli’s interesting if occasionally provocative and irreverent *Mysteries and Discoveries of Archaeoastronomy* (Magli, 2009), or his more staid and systematic *Archaeoastronomy: Introduction to the Science of Stars and Stones* (Magli, 2020). Older volumes such as Ed Krupp’s *Echoes of the Ancient Skies* (Krupp, 1983) and Anthony Aveni’s *Skywatchers* (Aveni, 2001) also remain useful, and all of these volumes will lead readers to the vast specialized literature.

By contrast, the volume at hand imparts to readers the major themes, issues, and goals of the field through very specific case studies. The result is a worthy addition to the literature, especially in those areas honoring Ruggles’ substantial contributions to the field. Those contributions include not only his own fieldwork at numerous sites, but also his insistence on methodologically rigorous pro-

cedures and placing archaeoastronomy in cultural context.

In the service of these more limited goals, the book is divided into three Parts: methodology, case studies, and heritage. The five chapters under methodology range geographically from North and South America (the Hopi and the Argentine Moqoit) to Greece, the broader Mediterranean, and ancient Iraq. One recurrent theme in several chapters is that the use of concepts such as ‘equinox’ is problematic when applied to other cultures in other times. Ruggles (1997) himself emphasized this in a short but famous paper “Whose Equinox?”, where he suggested the concept for ancient cultures should be abandoned. In his chapter on “What Equinox?” Juan Antonio Belmonte argues, based on eastern-



oriented structures in Mediterranean cultures and beyond, that the concept can still be useful if different levels of meaning are specified and understood. And in his article on “Their Equinox” John Steele demonstrates that Mesopotamians conceived solstices and equinoxes differently from our modern conception, that is to say, not as sunrise due east or sunset due west. The bottom line, made throughout this volume, is that we must be very careful imposing modern concepts on cultures of the past. Another point of this section is that cultural astronomy can be approached from many angles, including archaeological, text-

ual, and ethnographic, even though melding these approaches, when possible, is often fraught.

The six chapters of case studies in Part II range geographically from Ireland, northern Spain, and Greece to Mesoamerica and the Australian Aborigines. The first two chapters examine prehistoric stone monuments, arguing in the first case that certain ancient Irish tombs represented to their builders the direction of the abode of their ancestors, and in the second that the broader ritual landscape of the Chabola de la Hechicera megalithic site in northern Spain helps us understand the significance of a passage grave that is unconnected to sunrise or sunset. Another chapter examines the orientation of Greek temples, a subject where textual sources can now come to bear. The fascinating chapter on Mesoamerica analyzes the relation between Maya lunar concepts in eclipse tables of the Dresden codex with lunar observations encoded on monumental stelae, again highlighting the challenges of reconciling two very different sources of data. Tellingly, two of the case studies have nothing to do with monuments or alignments, showing the broad reach of the new 'cultural astronomy'. In a perceptive article on stars in ancient Greece Robert Hannah emphasizes something we often forget in the modern world, that

... the night sky was for the ancients an inseparable part of their perceived environment, a part that was not only embedded in daily activities but also in their belief systems, cosmologies, religious practices and civic activities. (page 220).

And in an essay on the 'Seven Sisters' constellation known as the Pleiades (first recorded by the Chinese in 2357 BC), Australian astronomers Ray and Barnaby Norris demonstrate the remarkable similarity of Pleiades mythology between the Greeks and the Australian Aborigines, arguing this may suggest a common origin before both groups left Africa 100,000 years ago, a conclusion they label the 'out of Africa' hypothesis.

Readers may be surprised that there is no mention of Stonehenge or Egyptian pyramids in these case studies, and indeed very little mention of them throughout the book. This is both a measure of the limited scope of the volume and of how the field of cultural astronomy has broadened beyond these iconic sites, even as they continue to reveal fascinating new information.

Readers of this journal may be particularly interested in the third section of the book on astronomical heritage, which also relates to Ruggles' significant work in this area dating

from 2009. When in that year he took over as President of the International Astronomical Union's Commission 41 (History of Astronomy) he created a Working Group on "Astronomy and World Heritage," which he chaired through 2015. This morphed into the current IAU Commission C4, which Ruggles also chaired through 2018, working closely with UNESCO and the International Council on Monuments and Sites (ICOMOS), as described in Michel Cotte's chapter. The work of these groups (Ruggles and Cotte, 2011; 2017) has resulted in many astronomical sites being added to UNESCO's list of World Heritage Sites. Among those just added in 2021 is the Chankillo pre-Classic (250–200 BC) archaeological astronomical complex in Peru. That solar observatory complex, on the north-central coast of Peru, receives a chapter of its own in this section detailing Ivan Ghezzi's work since 2001 on the layout and function of the building on the 48 hectares (119 acre) site. Although the site apparently was active for only 50 years, its analysis is a prime example of how the field has advanced, tying astronomical work to the culture that produced it.

The final paper in the Heritage section, by Gudrun Wolfschmidt, is an excellent overview of the architectural heritage of observatories, and strategies for adding them to the World Heritage List in the future. I should say from personal experience such designations are never easy. The current U.S. Naval Observatory site in Washington, DC, which for the last half-century has included the official residence of the Vice President of the United States in one of its buildings, was one day away from being designated a National Historic Landmark in 1989 when a single phone call from 'someone' on the Vice President's staff objected on the basis of not wishing to follow National Historic Landmark architectural rules. To this day, the current U.S. Naval Observatory site dating to 1893 is not designated a National Historic Landmark, although its first site a few miles away (c. 1844) is. Several other American sites have been so designated, and although Wolfschmidt does not discuss astronomy-related U.S. National Historic Landmark designations with respect to potential future World Heritage designation, the study undertaken for these historic sites would be a good place to start (Butowsky, 1989).

Taken together, the volume demonstrates the tremendous amount of meticulous work that has gone into the analysis of many megalithic sites, the systematic nature of the investigations by comparison with earlier work, and the extent to which megalithic archaeology and refined 'alignment hunting' is now only one part of cultural astronomy. In the past

claims about methods, alignments and overly-broad conclusions out of cultural context could be justifiably criticized. As cultural astronomy has advanced, it is still open to scholarly criticism and vigorous discussion, but at a much higher level. Overall the volume is a significant contribution to the field, a monument to Ruggles and his work, and a reminder of how much the heavens have influenced virtually all cultures on Earth over millennia.

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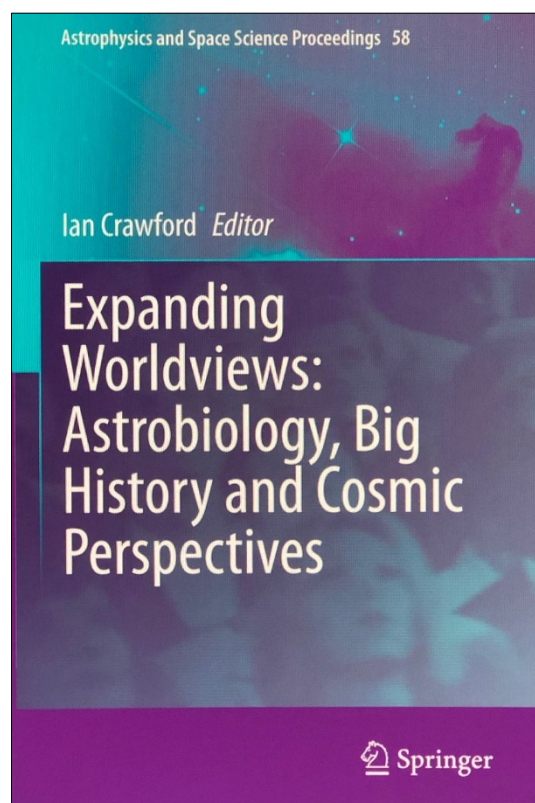
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***Expanding Worldviews: Astrobiology, Big History and Cosmic Perspectives*, edited by Ian Crawford (Cham (Switzerland), Springer, 2021). Pp. vi + 377. ISBN 978-3-030-70481-0 (hardback) 160 × 240 mm, US\$209.**

We historians of astronomy tend to revel, and sometimes get lost, in details. All to the good. But on occasion we should address the big picture, the worldviews that astronomy generates more than most other sciences such as biology, chemistry, or geology. Yes, physics gives rise to worldviews in the form of non-intuitive general theories of relativity and quantum mechanics, which few in the general

public understand or internalize in their daily lives. By contrast astronomy and the starry skies above give rise to cosmological worldviews, which throughout history have provided the mental framework within which ancient and modern societies have operated, even if in background, from geocentrism to heliocentrism to the Hubble Deep Field and a biological universe full of life (Dick, 1996), not to mention numerous other cosmologies such as native American.

This volume addresses astronomy's big picture and its effect on society through the four concepts in its title: worldviews, astrobiology, Big History, and cosmic perspectives. Tellingly, not a single historian of astronomy is among the 20 authors, which include scholars in astronomy, history, law, ethics, politics, science fiction, and futurism. This perhaps



says something about the field of history of astronomy and its penchant for smaller history. The volume is the result of papers given at two conferences held at the Australian National University in 2018 and Birkbeck College London in 2019, the latter the editor's home institution. Five of the papers appeared in earlier form in a special issue of the *Journal of Big History* (Volume 3, Issue 3, 2019). Their appearance here allows these big ideas to reach a wider audience, a laudable and practical goal for this subject, even if mitigated by the barrier of price.

After a brief introduction setting the stage by Ian Crawford (the astronomer at Birkbeck