

and lenses. He wants his reader to understand what was so novel about Kepler's analysis of the focusing properties of the eye's lens. These are interesting and crucial additions that honor the author's intention to supplement Lindberg's account.

Another marked difference between the two works is their disagreement as to the relationship between Kepler's visual model and the perspectivist theory: while Lindberg stresses continuity, Smith emphasizes discontinuity. I am wondering, however, if the divergence is as strong as Smith wants us to believe. In the end, both scholars seem to be convinced that Kepler constitutes an important transitional figure who was profoundly influenced by the perspectivist tradition yet broke with it at crucial points and thus set the scene for the rise of modern optics. It seems to me a question of emphasis rather than of a fundamental divergence. In any case, it is refreshing and inspiring to meet the same actors, now acting in a different play.

Throughout Smith's study, mathematical analyses of reflection, refraction, and other related issues play a crucial role. For those who are not well versed in mathematics, the endless details of ray geometry might at some point become frustrating, especially in the chapter on Ptolemy. This technical exposition slows the reader's tempo considerably, running the risk of losing sight of the general picture and the flow of the historical narrative. But let me offer some small encouragement: once you have gotten through this chapter, the rest of the book will become much smoother. Alternatively, take the author at his word on the technical details and skip directly to the conclusions. At the end of each chapter and subchapter, Smith clearly summarizes the main points, which is extremely useful and ties the different parts of the story together into a coherent whole.

The book is clearly illustrated with geometrical diagrams, although it is regrettable that diagram and corresponding explanation are not always on the same page. As a result of this, one finds oneself repeatedly turning pages back and forth. Moreover, there is no systematic use of the symbols (letters) in those diagrams. Whereas often *E* stands for the eye and *O* for the object, they are sometimes inverted without any apparent reason.

I believe that some carefully chosen "historical" images would make a welcome addition to the book in order to present a tangible sense of the past. One might also regret the absence of quotations. I would have loved to get a sampling of the actual voices of all those different historical actors, instead of hearing only the unifying voice of the omniscient narrator. But these are minor complaints that vanish rapidly in light of the highly fascinating and captivating story that Smith offers us. Indeed, as many have pointed out, this book has every chance to become a classic in the field.

Katrien Vanagt

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Antiquity

Anne S. Dowd; Susan Milbrath (Editors). *Cosmology, Calendars, and Horizon-Based Astronomy in Ancient Mesoamerica*. Foreword by E. C. Krupp. xxix + 380 pp., illus., figs., tables, index. Boulder: University Press of Colorado, 2015. \$80 (cloth).

Jeffrey L. Cooley. *Poetic Astronomy in the Ancient Near East: The Reflexes of Celestial Science in Ancient Mesopotamian, Ugaritic, and Israelite Narrative*. (History, Archaeology, and Culture of the Levant, 5.) ix + 396 pp., tables, bibl., apps., indexes. Winona Lake, Ind.: Eisenbrauns, 2013. \$54.50 (cloth).

The study of astronomy in culture, of conceptions of the sky and celestial objects in cultures past and present, has undergone profound changes in the last several decades. New data, new theoretical approaches,

and interdisciplinary cross-fertilizations have contributed to this dynamic scholarly landscape. The two works I review here reflect, each in its own way, the evolving interdisciplinary field of cultural astronomy and are indicative of the discipline's crucial role in a scholarly understanding of the past.

In *Poetic Astronomy in the Ancient Near East: The Reflexes of Celestial Science in Ancient Mesopotamian, Ugaritic, and Israelite Narrative*, Jeffrey L. Cooley delivers an overdue modern synthesis of the incorporation of celestial science and speculation into the Near Eastern literature of ancient Iraq and neighboring Ugarit and Israel-Palestine. It is the first such synthesis since the early decades of the twentieth century, elucidating the important role of celestial divination and calendrical concerns in such Mesopotamian works as *Girra and Elamatum*, *Erra and Išum*, and *Enūma Elis*. Cooley also analyzes the devotional manner in which Ugaritic Canaanite narratives such as the *Baal Cycle* and *Shahar and Shalim* portray astral deities, while convincingly arguing that in biblical narratives, despite the explicit prohibition of astral worship in Deuteronomy (4:15–19), astral bodies are depicted as active, conscious agents, belonging to Yahweh's court and linked to calendrical roles in the books of Genesis, Joshua, Kings, Isaiah, and Job.

That such a synthesis has not been undertaken since the early twentieth century is the result of several trends in the intellectual history of Near Eastern studies. The first of these was the pan-Babylonian school of the early twentieth century, which assumed that extremely precise astronomical knowledge, which had developed in the dawn of Mesopotamian civilization, was a foundation stone of Mesopotamian culture, religion, and literature. Cult and myth, in this view, were attempts by the priests to transmit this knowledge to society in a simplified and metaphorical manner. A further assumption of the school was that Babylonian culture and celestial science was then transmitted to surrounding cultures, including ancient Israel. Following the demise and refutation of the overly speculative and ultimately inaccurate interpretations of the pan-Babylonian school, scholars of Mesopotamian literature were extremely reluctant to engage with astronomy and celestial themes at all.

Second, Cooley convincingly argues that much of twentieth-century science history largely decontextualized Mesopotamian astronomy from its cultural setting and dismissed celestial divination and the methodical recording of omens as irrelevant to science studies. On the other hand, the work of these twentieth-century science historians produced major developments in the publication of primary texts in the Mesopotamian tradition of celestial science that Cooley credits with making his new synthesis possible.

Cooley argues that the refutation of the pan-Babylonianist school was due in large degree to its piecemeal speculation, made in the absence of explicit criteria for defining celestial science references and simple methodological safeguards. Thus, mere epithets referring to a deity in an astral or celestial manifestation are insufficient to identify the text with celestial science, since many deities have some fundamental celestial identity; the text must also feature terminology or concepts found in contemporary texts of celestial science.

In Mesopotamia, Cooley finds that while the celestial sciences were not as well developed as pan-Babylonianists assumed, the mantic, or divinatory, tradition was very sophisticated. Moreover, the “mantic power of the night sky was the core concern of those who observed it” (p. 110). These scribal observers were undertaking this effort in the service of royal policy making; thus it should not surprise us, Cooley concludes, that since these same scribal observers were also the authors of narrative literature, celestial science and royalty (celestial and terrestrial) permeate much of the literary corpus he analyzes. Cooley reflects that while this validates some of the assumptions of the pan-Babylonian school, the reasons behind the literary references, as well as the nature of the celestial science itself, were very different from what was imagined by the pan-Babylonianists. He also concludes that while some Mesopotamian influence is present in Ugarit and Israel, it was not a mother culture from which the distinctive celestial traditions of these cultures descended, as the pan-Babylonianists believed.

Cooley convincingly elucidates links between celestial science and the literature of ancient Mesopotamia, as well the somewhat different place of celestial bodies and asterisms in Canaanite and Israelite narratives, providing a synthetic and technical analysis whose conclusions will nevertheless be of great interest not only to specialists of the ancient Near East but to a broad range of scholars and teachers.

Cosmology, Calendars, and Horizon-Based Astronomy in Ancient Mesoamerica, edited by Anne S. Dowd and Susan Milbrath, provides a snapshot overview of scholarship concerning astronomy in Mesoamerican civilizations. The book will be of great interest to scholars in fields such as cultural astronomy, world history, and anthropology and also to the educated lay reader.

The book is divided into three thematic sections. In Part 2, "Horizon-Based Astronomy," Ivan Šprajc's "Pyramids Marking Time: Anthony F. Aveni's Contribution to the Study of Astronomical Alignments in Mesoamerican Architecture" summarizes Aveni's great contribution to alignment studies, which Šprajc's own systematic data collection has built on and continued, and highlights questions that remain for future research.

Anne S. Dowd discusses the wide range of seasonal light and shadow displays incorporated into Mayan architecture and urban planning, their possible symbolism, and their relation to social power and state formation, further suggesting that naturally occurring phenomena in the landscape may have inspired later astronomical-architectural hierophanies. In "Mountain of Sustenance: Site Organization at Dainzú-Macuixóchitl and Mesoamerican Concepts of Space and Time," Ronald K. Faulseit argues that the site is organized on a central *axis mundi* defined by the rising and setting of the winter and summer solstice sun and further organized into earth and sky elements.

Part 3, "Cosmological Principles," explores cosmological conceptions, including the creation and destruction of the world and the role astronomy played in seasonal ritual activities and religious iconography. Clemency Coggins explores the evolving personification and calendrical role of the Celestial Pole in Middle and Late Preclassic Mesoamerica, engaging with controversies about the Mayan symbolic conceptions of north and allegories in the *Popol Vuh*. Susan Milbrath's "A Seasonal Calendar in the Codex Borgia" argues that the eighteen-page sequence seasonally contextualizes "real time" celestial events—including the solstices and the phases of Venus and the moon. These are linked with the annual cycle of festivals and events such as drought, flooding, and crop infestations. Thus the codex also includes what Milbrath argues amounts to a climate record linked to celestial observations. In "Iconography and Metaphorical Expressions Pertaining to Eclipses," Gabrielle Vail explores the mythic associations of eclipses that are contained in almanacs and astronomical tables—suggesting that in addition to being seen as harbingers of dangerous times, they were also seen to coincide with transitional periods between specific intervals of time.

In "The Maya Deluge Myth and Dresden Codex Page 74" John B. Carlson argues that imagery previously interpreted as representing a catastrophic flood is instead a representation of seasonal rains. Thus, rather than a torrential apocalypse, the imagery is one of eternal regeneration linked to the role of the divinatory almanacs in the Dresden Codex, which served to guide the Maya daykeeper's ritual activities linked to maintaining the cyclical renewal of the world.

Part 4, "Calendar Records," begins with a chapter by Flora Simmons Clancy, "The Ancient Maya Moon: Calendar and Character," that examines the role of the moon and its association with Venus in calendar inscriptions found on monuments, especially freestanding *stelae*. David A. Freidel and Michelle Rich speculate that the grave goods, including carved bone stick bundles, spindle whorl tokens, and spangles, found in elite graves at El Perú-Waka' were used in divinatory practices linked to calendar reckoning. In "'The Las Bocas Mosaic' and Mesoamerican Astro-Calendrics: 'Calculator' or Hoax?" Prudence M. Rice analyzes an artifact whose provenance is uncertain. While Rice maintains a suitable skepticism, many scholars may be unconvinced by her conclusion that it is either a remarkable hoax or a unique calculator; they will nevertheless find the discussion of mirrors, scrying, and divination of considerable interest. Victoria R. Bricker and Harvey M. Bricker discuss Mayan astronomical records of eclipses and conclude that, in contrast to modern astronomy, which views eclipses in relation to the synodic month, Mayan specialists were interested in an "eclipse season" of about a month in length during which a solar and a lunar eclipse might be visible. In "Modeling Indigenous Mesoamerican Eclipse Theory," John Justeson develops a conjectural model and method by which Mesoamerican daykeepers might plausibly have predicted the likelihood of an eclipse and produced the colonial Zapotec almanacs.

The concluding chapter is—naturally, perhaps—written by Anthony Aveni, whose influence resonates throughout the work. Aveni suggests that the volume's interdisciplinary contributions testify to the fact that cultural astronomy has at last found its true home in anthropology. Certainly the interdisciplinarity of the work—with contributions from anthropologists, art historians, and astronomers—is testimony to the anthropological, interpretive turn that cultural astronomy has taken in the last decades. Taken as a whole, the volume provides an authoritative collection of scholarship concerning the importance of the sky and celestial objects in ancient Mesoamerican cultures.

The two works here reviewed, despite their entirely different cultural focus, highlight major advances in cultural astronomy and the history of science. In addition to shedding new light on the place of astronomy and celestial science in ancient civilizations, these works demonstrate the crucial role of interdisciplinary research in elucidating the role the sky and celestial bodies have played in human societies.

Morgan Saletta

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Ido Israelowich. *Patients and Healers in the High Roman Empire.* ix + 191 pp., figs., bibl., index. Baltimore, Md.: Johns Hopkins University Press, 2015. \$59.95 (cloth).

During the first three centuries of the Common Era (the High Roman Empire), the Roman Empire enjoyed a period of great stability and prosperity. A powerful Roman army maintained this Pax Romana, and a highly developed network of roads facilitated movement within the empire. These conditions made it possible for one particular type of medicine, the medicine practiced by Greek physicians following the principles of Hippocrates and other earlier doctors, to spread throughout the empire. This is the period that Ido Israelowich examines in this entertaining and well-informed study. This is not an understudied era—quite the contrary, as it gave birth to some of the most noted medical writers of antiquity: Rufus of Ephesus, Soranus of Ephesus, Celsus, the encyclopedist Pliny the Elder, and, above all, Galen of Pergamum. Galen's prolific output is at the same time a gift and a curse for the medical historian, as it both shapes our understanding of ancient medicine and at times, no doubt, clouds it. Israelowich manages to give due credit to this great author without centering his study on him, which is admirable. In addition to the writings of medical authors, Israelowich takes into account other types of sources, such as legal texts, papyri, and inscriptions.

Israelowich's aim is to study the medicine of this period from the viewpoints of both the medical practitioners and the patients who employed their services. The book therefore opens with two general chapters, one on each of these groups. Israelowich, like other medical historians, talks of a "medical marketplace." The absence of any medical licensing system in antiquity meant that "anyone" could set up as a healer, but such practitioners had to prove their ability to cure in order to be successful. Within that competitive environment, authority resided in the medical practitioner, but power was in the hands of the patients. They had the means to make or break the careers of aspiring healers: "society filled the role of a modern licensing body by recognizing its best physicians" (p. 44). This distinction between authority and power is a useful one, although perhaps not one that works in all contexts. Certainly, in the great metropolises of the ancient world patients would have had much power, but that would not always have been the case in the more remote parts of the empire—a point that Israelowich perhaps does not stress enough. In addition, as he readily admits, recovering the point of view of the patient in the ancient world is an arduous task, since we have no patients' testimonies for this period, with the notable exception of Aelius Aristides' *Sacred Tales*. Therein, Aelius recounted his experiences of seeking healing both from "scientific" doctors and from the priests of Asclepius, the god of medicine. Israelowich shows that Aelius and his