ronmental conditions that might affect a gecko's ability to adhere to a surface. However, a rather curious omission is the defense mechanism of the beetle *Hemisphaerota cyanea*, discovered by Thomas Eisner and Daniel Aneshansley in 2000: To achieve a secure footing and make it nearly impossible for its predators to dislodge it, the beetle makes use of capillary forces, generated by an oil dispatched through a large number of adhesive bristles. The book's final chapters deal with structural coloration. Chapter 14 focuses on nacre, or mother-of-pearl. Chapter 15, which deals with the ways structure affects surface coloration, uses the wing scales of butterflies and the exoskeletons of beetles as its key examples.

In general, the book is a nice introduction to biomimetics. Its many references will aid researchers who want to learn more about the field, though it is a bit disappointing to see that some key original references are not cited. But regardless of its minor limitations, *Biomimetics* is a well-written compendium that will serve a need in the ever-growing field of biomimicry.

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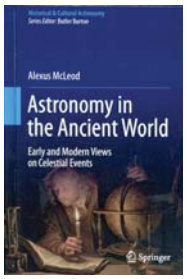
Astronomy in the Ancient World

Early and Modern Views on Celestial Events

Alexus McLeod

Springer, 2016. $129.00 (234 pp.). ISBN 978-3-319-23599-8



Alexus McLeod's new book, *Astronomy in the Ancient World: Early and Modern Views on Celestial Events*, without a doubt represents a noble intent. Astronomy is often considered the "first exact science" in Western scientific thought. McLeod informs readers up front that he is seeking a much more inclusive history of astronomy. Accordingly, the 234-page book, broken up into an introduction and four parts with two chapters each, aims to cover non-Western astronomies around the globe. McLeod includes celestial traditions of Mesoamerica, Native North America, China, and India alongside an abridged treatment of early European astronomy.

The strength of the book is part 2, which deals with China. The material is well organized, and McLeod successfully places Chinese astronomical activity in its cultural context. The opening material analyzes the development of the armillary sphere and its utility for Chinese sky watching. That serves as a solid introduction, and McLeod follows it by using historical records to demonstrate connections between celestial events and the political and cosmological contexts that rendered them meaningful to historical observers. For example, McLeod reviews the three major Han-era cosmological theories—*gai tian*, *hun tian*, and *xuan ye*—as cosmological concepts and as inspirations for political organization. His descriptions are insightful and well developed.

The rest of the book, unfortunately, is of distinctly lower quality. The part on India has a promising concept: It seeks to place the monumental astronomical instruments patronized by 18th-century Indian ruler Jai Singh II in a broader cultural and political context. Some of the material is interesting—for example, McLeod effectively relates Singh's astronomical pursuits to his interest in traditional religious rituals—but the overall treatment wanders tremendously. A rushed section on "Islamic Thought and Astronomy, and Its Influence on India," for instance, contains several redundant paragraphs, which suggests a lack of authorial attention.

Furthermore, the book's intended audience is unclear. I often found myself wondering whether it was written as a textbook for a high school class. At one point, McLeod writes, "One easy way to think of this is to think of it in terms of a Cartesian coordinate system, on a flat surface—one of the kind you've likely seen in school. In such a coordinate system any point is located by an x and y position. To determine the location of any given point, we have to determine where it is along each axis." The assumption that readers will need a Cartesian plane explained feels out of step with much of the rest of the book.

The ambiguity of the intended audience, though, is not the only trouble. It is clear that neither the reviewers nor the editors paid sufficient attention to the production of the book. Numerous typographical errors appear throughout the text; a mistake like "Pleades star cluster" should not have made it into print once, much less twice. Even the material on China does not escape editorial problems. There are consistent typographical errors and one footnote (on page 87) that reads simply as "^{6}Dubs . . ." with no corresponding reference in the bibliography.

Had I not agreed to review the entire book, I never would have made it past the first part, which covers Mesoamerican astronomy, my own area of research. No Mesoamerican record exists of the supernova of AD 1054, but McLeod devotes an entire passage to "1054 for the Maya: Some Speculations." If his intent is to raise greater awareness of non-Western astronomies, his efforts would have been better served by getting right what is known, rather than offering unsupported hypotheses that he himself refers to as "wildly speculative." Overall,

the section on Mesoamerica lies somewhere between a strong undergraduate paper and a well-researched Wikipedia page.

The scholarship that *Astronomy in the Ancient World* relies on is primarily from the late 1990s. In many fields, that might not raise red flags; in Mayanist scholarship, however, the 1990s were the period in which our understanding of the hieroglyphic writing system had just begun to mature. Therefore, many of the interpretations generated during that decade relied on tentative readings that did not stand the test of time. McLeod makes extensive use of debunked interpretations, even recalling them for comparative material in his sections on Chinese and Indian astronomies. Perhaps least convincing is the forced attempt to relate the supernova of 1054 to a "Toltec conquest of Chichén Itzá." The idea that the Toltecs conquered Chichén Itzá has not been considered a legitimate interpretation of the historical record since the 1960s.

Unquestionably, raising the visibility of non-Western sciences has value, but the author has not convinced me that this book has done it. Moreover, the fault is not McLeod's alone. The lack of careful editorial attention is even revealed on the cover. McLeod describes the book as "an attempt to encourage deeper study and greater understanding of ancient and Non-Western astronomical traditions." The cover image, however, is the painting *Astronomer by Candlelight* by Dutch Renaissance artist Gerrit Dou.

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