



Ancient Astronomy and Celestial Divination

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even though—or perhaps because—Levitt would blanch at the word) of the way in which “nature” is invoked in moral as well as descriptive senses. It is at these moments that Levitt’s goals begin to overlap with those of the science studies scholars whom he derides.

Rather more problematic is the sense one gets from the book of the humanities disciplines as hopelessly naive and self-deceiving. This is apparent, for example, in Levitt’s attack on the familiar bugbear of opponents to science studies, postmodernism. The antifoundationalism of postmodernism may well lead to the naive relativism of some postmodernist thinkers, but it can also lead to an informed skepticism that is not so far removed from the skeptical mode of inquiry he rightly trumpets as a success of scientific enterprises. Furthermore, to be opposed to postmodernism per se is to accept an unnecessarily limited understanding of our culture: if there is a postmodern culture out there, and if one’s subject of study is culture, then postmodernism cannot be ignored.

A similar objection might be made to those parts of the book where Levitt presumes to speak of the roles humanities disciplines should perform (which is not to deny that science studies scholars have at times been equally presumptuous in their statements about science). For instance, he condemns the abolition of “barriers between high culture and low” (p. 43) without taking into account the broader descriptive, rather than simplistically evaluative, roles that the humanities have recently adopted toward culture. These new roles have their roots in debates going back over a number of years, and it is not adequate to write them off without engaging with those debates.

Despite these objections—and one might also question the presentation of the various manifestations of multiculturalism as monolithically unselfcritical entities—*Prometheus Bedeviled* is an important contribution to debates about science within our culture, perhaps precisely because of its provocative qualities. Levitt forces us to consider the ways in which science is expressive of the world and the inevitable boundaries beyond which those of us who lack scientific talent or training cannot go. To acknowledge these objections is not necessarily to deny that scientific knowledge takes on ideological significance as soon as it is expressed (or remade and translated for a lay audience) and that this ideological significance might not be analyzed as part of a broader understanding of the culture by those of us for whom this is an imperative issue. Alongside its presentation of

an essentially “true” science, *Prometheus Bedeviled* shows, despite itself, just how beset by ideology the term “science” is.

DANIEL CORDLE

■ Antiquity

N. M. Swerdlow (Editor). *Ancient Astronomy and Celestial Divination*. x + 378 pp., figs., tables, bibls., index. Cambridge, Mass.: MIT Press, 1999. \$50.

This excellent collection of essays arose from a conference on ancient astronomy and celestial divination organized by Noel Swerdlow at the Dibner Institute for the History of Science and Technology in May 1994. Together they span several millennia, from Babylonia (southern Iraq) in the early second millennium B.C.E. to fifth-century Christian Egypt. Naturally, though, the focus is on the sources, periods, and places for which there is most evidence, namely the cuneiform tablets of Babylon and Uruk in the Hellenistic and Parthian periods (ca. 350 B.C.E. – 50 C.E.) and the Greek and Demotic papyri from Lower Egypt in the second to fourth centuries C.E. Noel Swerdlow’s introduction is a useful and wide-ranging historiography of the subject, from classical and biblical accounts of “Chaldaean” astronomy and medieval translations of Ptolemy to the rededication of cuneiform and an assessment of the current state of the field.

In the first essay Erica Reiner traces the origins of Babylonian celestial divination to unsystematic and oblique allusions to lunar eclipses and other phenomena in the sky, from the early second millennium B.C.E. onward, which portended the fates of kings and kingdoms. Francesca Rochberg, on the other hand, surveys personal horoscopes from late first-millennium B.C.E. Babylon: celestial omens taken at the birth of individuals to determine their personal destinies. Both authors raise interesting questions about the relationship between divination and mathematical astronomy in Mesopotamia.

The next three essays all concern cuneiform records of astronomical observations in first-millennium B.C.E. Babylonia. Christopher Walker publishes a collection of observations of Saturn made in 647–633 B.C.E., contemporary with the earliest surviving *Astronomical Diaries*. Hermann Hunger shows that the predictions in the *Almanacs* and *Normal Star Almanacs* cannot have been copied from observations in *Goal Year* texts and gives specimen translations of texts from each genre. Gerd Graßhoff’s com-

puter-based analysis of some aspects of the Astronomical Diaries is particularly exciting methodologically.

Lis Brack-Bernsen, John Britton, and Swerdlow all write about technical aspects of Babylonian calculational theory, namely, the observation and prediction of lunar events other than eclipses, the theory of lunar anomaly in System A, and the derivation of parameters for the ephemerides from observations of heliacal events recorded in the Astronomical Diaries. Asger Aaboe adds significantly to the known corpus of late Babylonian mathematics with a tablet containing an unusual collection of multiplication tables.

The last three essays of the book tackle Graeco-Egyptian astronomy. Alexander Jones systematically classifies the astronomical tables found on papyri from Oxyrhynchus and elsewhere. Notes on many individual texts highlight the continued use of Babylonian astronomical methods into the second century C.E., contemporary with Ptolemy. Bernard Goldstein and Alan Bowen argue controversially that Ptolemy relied primarily on his own observations as the basis of his lunar theories and used the ancient Babylonian observations, as recorded by Hipparchus, only to confirm his ideas. I have yet to see any attempt to elucidate the mechanism by which celestial observations, calculational schemes, and the sexagesimal place-value system were transmitted from Babylon to Egypt, a thorny issue that, sadly, even this stellar conjunction of experts has avoided. Finally, Anne Tihon presents a reassessment of Theon of Alexandria's fourth-century commentaries on Ptolemy's *Handy Tables*, absolving him from longstanding accusations of poor editorial standards. No such criticisms could be leveled at this beautifully produced book either. Swerdlow and his colleagues have produced a fascinating and indispensable volume that belongs on the bookshelves of all those interested in early intellectual history. I recommend it unreservedly.

ELEANOR ROBSON

Ptolemy. *Ptolemy's Almagest*. Translated and annotated by **G. J. Toomer**. Foreword by **Owen Gingerich**. xvii + 693 pp., figs., tables, apps., bibl., index. Princeton, N.J.: Princeton University Press, 1998. \$39.50 (paper).

David Pingree. *Preceptum Canonis Ptolomei*. (Corpus des Astronomes Byzantines, 8.) 172 pp., indexes. Louvain-la-Neuve, France: Academia Bruylant, 1997. 140 Fr (paper).

G. J. Toomer's definitive modern-language edition of Ptolemy's *Almagest*, his main astronomical treatise, first appeared in 1984. This new paperback edition, published by Princeton University Press, makes accessible to everyone the book that determined the accepted view of the universe for one and a half thousand years. For this new printing Toomer has added some references to recent literature and supplied a (short) list of corrections.

The *Almagest* is not a book for the casual reader. After a dozen or so pages of generalities, it takes off with a description of the computational methods used in the later chapters of the book. Of general interest is Ptolemy's method of constructing a geometrical model, repeated chapter after chapter for the sun, the moon, and the planets. (Copernicus follows the same pattern.) The reader who has the strength to delve into the details of the *Almagest* will benefit from the excellent commentaries by Olaf Pedersen (*A Survey of the Almagest* [Odense, 1974]) and Otto Neugebauer (*A History of Ancient Mathematical Astronomy* [Springer, 1975]).

The other books by Ptolemy that are generally available are the *Tetrabiblos* (Loeb Classical Library), a treatise on astrology whose style presents a stark contrast to that of the *Almagest*, and the *Geography* (Dover). But there remain major gaps in the general understanding of Ptolemy's scientific work. The debate about the nature of astronomical models, for example, is still unresolved. This debate dates back to antiquity: are these models computational devices for "saving the appearances" or are they meant to be realistic? A passage in Ptolemy's *Planetary Hypotheses* pertaining to this question was for some reason missing in the scholarly nineteenth-century edition of Ptolemy's works produced by Heiberg. Recovered by B. R. Goldstein in 1967, it showed that Ptolemy intended his models to be understood in the latter way. This finding had a substantial effect on the interpretation of the *Almagest* itself. In Ptolemy's *Optics*, the doctrine of saving the appearances is brought down from the heavenly spheres and acquires quite a concrete sense in the explanation of optical illusions. These and other similar works are accessible only to scholarly readers. In antiquity science had a philosophical emphasis, no doubt partly because of the general availability of philosophical works. Given this situation, it seems paradoxical that Ptolemy's own philosophical work, *On Judgment and Guiding Reason*, is unavailable to readers who know only modern languages.

The *Preceptum Canonis Ptolomei*, or "The