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ESSAY REVIEWS

ASTRAL SCIENCES IN MESOPOTAMIA

The Heavenly Writing: Divination, Horoscopy, and Astronomy in Mesopotamian Culture. Francesca Rochberg (Cambridge University Press, New York, 2004). Pp. xxviii + 331. $70. ISBN 0-521-83010-9.

The Mesopotamian 'astral sciences' (astronomy, celestial divination, and horoscopy) at present constitute one of the most active fields in the study of early science. Two or three times as many people are currently doing specialized work on Babylonian mathematical astronomy than, for example, on its Greek counterpart. Another manifestation of the heightening of interest in this area is the appearance in the past few years of several books that try to make sense of the astral sciences as a single entity, or at least as an evolving complex of interrelated traditions. Francesca Rochberg's outstanding study centres around divination and horoscopy, or loosely 'astrology', while showing how these practices were inextricably connected with observational and predictive astronomy. In scope but assuredly not in thesis, *The heavenly writing* is nearest to David Brown's *Mesopotamian planetary astronomy-astrology* (2000), which interpreted the evolution of Mesopotamian astronomy during the first half of the first millennium B.C. as a Kuhnian scientific revolution. Whereas Brown's focal point is the Neo-Assyrian court of the seventh century B.C., and particularly the letters and reports of scholars to the kings Esarhaddon and Assurbanipal, Rochberg has much more to say about the subsequent periods (Neo-Babylonian, Persian, Seleucid, Parthian), the time from which we get the personal horoscopes, the texts of mathematical astronomy, and the great part of the surviving observational records.

Rochberg sets out by way of an historiographical investigation, in which the chief question is, "Why were historians of science through the twentieth century resistant to characterizing Mesopotamian astronomy and astrology as 'science'?" The writers in question were for the most part not the primary researchers such as Kugler, Neugebauer, Weidner, and van der Waerden; one would like to know what *they* had to say on the question, or if they kept silence, it would be interesting to ponder why. Rochberg emphasizes the role of changing philosophical presuppositions about what science is in maintaining a barrier that kept Greek astronomy in but Babylonian astronomy out. It is indeed remarkable how talk about the status of Mesopotamian and Egyptian medicine, mathematics, and astronomy has always been framed in relation to Greek science, and above all in relation to the Greek philosophers' interpretation of science as an investigation of causes, which was supposedly missing from Near Eastern thought. Of course the ancient philosophers knew what their modern advocates have sometimes forgotten, that there are many varieties of cause besides the mechanical and material causes that we encounter, say, in Ptolemy's *Planetary hypotheses* but not in a System A lunar tablet from Babylon; and the waters were further muddied when historians such as Dreyer — and even

Neugebauer on occasion — maintained that Ptolemy really regarded his epicycles and eccentres as mere calculating devices. One should not underestimate the part in this story played by less rational motives, the instinct to defend received ideas in the face of new evidence (it is only in recent years that 'groundbreaking' has become the obligatory characteristic expected of all academic research), and, frankly, by the fact that very few people have sufficiently detailed familiarity with Babylonian mathematical astronomy to realize how profoundly analytic it is, and how remote from mere pattern matching applied to crude observations.

Having edited a large body of Babylonian omen texts (the ones concerned with lunar eclipses) and all the known Babylonian horoscopes, Rochberg is able to give us a clear, detailed, and authoritative description of these categories of text and their cultural context, as the background to the two central chapters in which she investigates the sources of the overt and latent astronomical and astrological elements in the horoscopic documents. A horoscope in the Greek tradition is an interpreted 'snapshot' of the location of the sun, moon, planets, and assorted conceptual astrological entities relative to the zodiac and to the local horizon at a significant instant, say the birth of a child. The Babylonian horoscopes are different in that the time reference is blurred, so that statements are included pertaining to astronomical phenomena occurring before and after the date of birth, while little or nothing is specific to the precise moment. Greek horoscopes depended for their astronomical facts on predictive mathematical astronomy embedded in numerical tables and almanacs, the Babylonian analogues of which would have been the mathematical astronomy of Neugebauer's *Astronomical cuneiform texts* (*ACT*). Rochberg demonstrates, however, that only a few elements in a minority of Babylonian horoscopes can plausibly have been obtained from the *ACT* tablets, and even these dependencies are not certain. The chief sources turn out to have been varieties of text connected with the direct observation and prediction of phenomena using methods that are only in the most elementary sense mathematical, namely the so-called Diaries and Almanacs.

This result has the unexpected corollary of making it harder to understand how the various kinds of astronomical text hang together. We tend to think of the observational or non-mathematical texts (neither term is perfectly apt) as representing an earlier stage of Babylonian astronomy than the *ACT* material, and this may be true; but the fact is that with the exception of the Diaries, some of which are as old as the mid-seventh century, all the extant non-mathematical tablets come from the same period as the *ACT* texts, namely the last three centuries B.C. Moreover, where the two classes of text present comparable kinds of predicted data, the *ACT* methods, though undoubtedly displaying greater analytic understanding of the phenomena, are not appreciably more accurate than the non-mathematical methods, and often they are worse. Yet Rochberg proved a few years ago on the basis of Babylonian temple documents from the second century B.C. that the making of Diary, Almanac, and *ACT* tablets was part of the expertise of a single group of scholars. What was the point of *ACT*, then? One attractive hypothesis has been that *ACT* methods were motivated by the rise of horoscopy, which supposedly created a demand for precise

computed longitudes of the heavenly bodies in degrees within zodiacal signs. Now we see that this was wishful thinking, and *ACT* remains an enigma with no known important application. (Perversely, in Roman Egypt during the first centuries of our era, transmitted *ACT* methods *were* commonly employed by astrologers — more so, seemingly, than tables based on geometric modelling — a circumstance that shows the danger of assuming that techniques retain their original functions when they migrate from one milieu to another.)

Because of the way in which Rochberg frames the question, asking from what texts do the data in the horoscopes come, rather than why were those source texts produced, she puts less stress upon the serious problems inherent in relating the non-mathematical astronomy to astrology. While the horoscopes drew heavily on the non-mathematical texts, they certainly cannot stand as an adequate explanation of the existence of the non-mathematical texts. The oldest known horoscopes, after all, date from the late fifth century B.C., more than two hundred years later than the earliest known Diary; and even when one makes allowances for the capriciousness with which documents have or have not come down to us, a corpus of some thirty extant horoscopes scarcely implies a level of activity that would justify the vast project of generating thousands of Diaries and Almanacs that we know was carried out in Babylon. The relation of the non-mathematical astronomy to the older tradition of astral omens likewise remains obscure. Some relation there definitely was, as can be seen for example from the correspondence between the way that lunar eclipses are described in omen texts and in the Diaries and other observational texts, but a large part of what the Diaries regularly recorded, including the very frequent reports of the moon and planets passing by stars, has only the remotest connection with the omen literature. This was part of what Brown has tried to account for through a 'revolution' by which celestial regularity (predictable phenomena) supplanted irregularity (ominous events) as the primary subject matter of astral science. One does not have to follow Brown in the full rigidity of his historiographical model to see that he has a point, and I think it is not entirely fair when (on p. 12) Rochberg characterizes the supposition that new ways of thinking emerged out of the omen literature in the first half of the first millennium B.C. as a recasting of an "outmoded historiography".

The textual sources of the astrological interpretations sporadically inserted in Babylonian horoscopes were varieties of astral omen text in which the predictions concern, not whole nations and their kings as in the older astral omen literature, but ordinary individuals. Thus the ideological foundations of horoscopy and divination by omens were the same; and Rochberg's analysis of what these foundations were is the profoundest section of her book. While it is evident that the occurrences interpreted as omens were attributed to divine agency, and the heavenly bodies were associated in the language of the omen texts with divinities, it proves less easy to distinguish whether the sun, moon, and planets were themselves identified as gods. Rochberg provides good arguments for interpreting the anthropomorphic expressions applied to the heavenly bodies in some omen texts as metaphorical, which implies a separation in thought between the gods of the Mesopotamian pantheon and the

visible objects in the sky. (It deserves remembering that Ptolemy too describes the heavenly bodies of his cosmology, both visible and invisible, as 'divine' though he never calls them gods.) The omen texts, which gave men the knowledge of what the divine signs meant, were themselves seen as having divine authority handed down from ages past, but a key point of Rochberg's analysis is that, far from prohibiting empirical research and innovation, the supposed transmission of the omen texts as a revelation from the gods was a stimulus to investigation of the phenomena as a route to better comprehension of the texts. As Rochberg takes care to state, however, Babylonian astronomy went beyond that function, and the questions it addressed were independent of the conceptual foundations of astral divination and horoscopy, for all that its practitioners were also diviners and horoscopists.

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EGYPTIAN ASTRONOMY

La Astronomía del Antiguo Egipto. José Lull (PUV, Valencia, 2004). Pp. 372. €20 (paperback). ISBN 84-370-6049-4.

> Finally, and in spite of the irreparable loss of possible treatises on astronomy, stellar tables of position, etc., which have not come down to us, Egyptian astronomy, or the interest of the Egyptians in the heavenly vault, has been fossilized at the archaeological level through the architecture and orientation of the temples. This aspect of Egyptian culture cannot be denied, for there are many proofs in support of it, and this despite the absurd and audacious hypotheses that have been advanced in this connection and which are in fact a setback to archaeoastronomy (p. 346).

Of the social sciences, Egyptology is perhaps the most rapidly changing. The scientific community is continuously bombarded with new discoveries, or new approaches to ancient topics. This knowledge furthermore can easily and quickly be transmitted to an enthusiastic society infected by 'Egyptomania' by means of popular accounts, not to mention the huge number of related pages on the Internet.

Curiously enough, this has not been the case for one topic which, however, has a very important role because of its important connection to chronology. I refer to ancient Egyptian astronomy. For many decades, the last word on the subject was R. A. Parker's *Calendars of ancient Egypt* or Neugebauer and Parker's *Ancient Egyptian astronomical texts.* Only a decade ago, Marshall Clagett shed new light on the subject when he questioned "established" paradigms and opened new insights and discussions. In my opinion, this was a critical moment to advance in the study of various topics in ancient Egyptian astronomy such as the calendar, the celestial diagram or