using various strengths of grey-scale infill, particularly clear or effective. Given these limitations, the drawings are mostly superfluous except as schematic guides to the position of the figures and texts. Thankfully, the excellent photographs contained in Part 3, along with the high-resolution color digital images contained on the DVD-ROM, make it possible for the reader to form an appreciation of the baroque elegance and sophisticated detail that characterize the decoration of this monument.

The only other complaint that this reviewer would like to make concerns the physical quality of the books themselves; the glossy card covers are rather flimsy, while within the volumes the ink from the printing has bled through the paper in several places, obscuring the other side of the page, and the thin cardboard slipcase quickly shows signs of disintegration. Such flaws do not accord with the tradition of excellence maintained heretofore by the press of the IFAO, from whom the high price of this publication might also entitle the reader to expect better.

These considerations notwithstanding, the appearance of *Athribis II* is of immense significance for the community of scholars interested in Ptolemaic and Roman temple texts and the religious developments of the terminal Pharaonic age. Among the major questions still to be answered is whether this monument was in fact a *mammisi*, as is suggested by the tripartite central shrine, the colonnade surrounding the core of the temple, and perhaps even its orientation with respect to the Ptolemy IX gateway. Many of the texts and scenes presented in this volume reinforce this idea, and if Prof. Leitz avoids committing himself absolutely on this point, it is doubtless out of a reasonable prudence, given that the remaining inscriptions have not yet been studied in full.

Leitz and his team are at all events to be commended for undertaking an epigraphic project fraught with an unusual set of physical obstacles, but which nevertheless will continue to enrich the corpus with a wealth of previously unknown inscriptional material. Innovative methods of presentation, especially the inclusion of a full set of digital color photographs, have enhanced the utility of this publication for both philologists and students of art and iconography, and this reviewer will join his colleagues in eagerly anticipating the appearance of future volumes in the series.

Calendars and Years: Astronomy and Time in the Ancient Near East. Edited by John M. Steele. Oxford: Oxbow Books, 2007. Pp. vii + 167 + 23 figs. + 36 tables. $50 (paperback).

Reviewed by Mathieu Ossendrijver, *Humboldt University*

This work contains seven papers devoted to astronomy and calendars in Ancient Egypt, Mesopotamia, and the Greco-Roman world. Except for the paper by Jones, all were presented at the seventh Biennial Workshop for the History of Astronomy held at Notre Dame University on 8 July 2005.

In her contribution "A Star's Year: The Annual Cycle in the Ancient Egyptian Sky," Sarah Symons discusses Egyptian "diagonal star clocks" and their relation to the calendar. This group of now twenty-one sources from the Ninth to the Twelfth Dynasties, usually painted on wooden coffins, continues to pose vexing problems for interpretation. Symons argues that the "standard" interpretation proposed by Neugebauer and Parker[1] does not hold up in light of newly discovered exemplars. It was commonly believed that the star clocks were, ideally, used for telling the time at night. However, due to the wandering nature of the Egyptian 365-day year they become useless after about forty years. Furthermore, the variations among them cannot be explained as revisions designed to keep them up to date.

Leo Depuydt ("Calendars and Years in Ancient Egypt") discusses the Egyptian calendar, which is based on a 365-day year consisting of twelve months of thirty days each, plus five epagomenal days, with a focus on the period 1500–500 B.C. His contribution begins with an extensive review of the history of research on this topic, including a discussion of double dates (Egyptian/West Asian) preserved in Aramaic papyri from the fifth century B.C. (pp. 53–60). The West-Asian dates employ a Babylonian-type lunar calendar (i.e., a true lunar calendar anchored to lunar

[1] O. Neugebauer and R. A. Parker, *Egyptian Astronomical Texts*, Volume 1: *The Early Deacons* (London, 1960).

phases). Indeed, for nearly all of these dates, day 1 of the month occurs one to three days after the New Moon (the conjunction of Sun and Moon), suggesting that day 1 was defined by the first appearance of the crescent, as in Mesopotamia. Depuydt nevertheless challenges this obvious conclusion (p. 56), proposing instead that ancient lunar calendars might be "untidy," that is, they might be linked to the first appearance of the crescent only in some mean sense. He rightly points out that any sequence of month lengths (twenty-nine or thirty days) producing a mean month of 29.53 days would suffice to obtain a functional, "untidy" lunar calendar. However, the existence of "untidy" lunar calendars remains speculative, and can be virtually ruled out for Mesopotamia. Subsequently, Depuydt presents a lucid discussion of the foundations of Egyptian chronology for the period 1500–500 B.C., concluding that there is no viable alternative to the "standard chronology" derived from reported dates of the heliacal risings of Sirius (Sothis).

Lis Brack-Bernsen ("The 360-Day Year in Mesopotamia") examines Mesopotamian usage of an administrative calendar containing twelve months of thirty days each. The available evidence suggests that, from the Early Dynastic III period (ca. 2600 B.C.) until the end of cuneiform, this calendar was used for administrative and divinatory purposes, alongside the civil luni-solar calendar with its variable month lengths (of twenty-nine or thirty days) and occasional intercalary months. It appears that the schematic calendar was no longer used for administrative purposes after the Old Babylonian period, but it does show up in later omen astrology (e.g., the series *Enūma Anu Enlil*), where deviations from the ideal calendar were considered auspicious. In the Seleucid Era, so-called Calendar Texts, which feature a division of the month into thirty "days," testify to an application of the schematic calendar to zodiacal astrology. In some of these texts, the days of the schematic calendar are correlated either with cultic activities or their prohibition. This raises the question of how precisely these texts were used, since the cultic (civil) calendar governing religious festivals and temple rituals was, as always, based on months of variable duration.

Wayne Horowitz ("The Astrolabes: Astronomy, Theology, and Chronology") discusses Mesopotamian "Astrolabes," the conventional name for a group of star lists comprising thiry-six stars, arranged in twelve groups of three, corresponding to the three "paths of the sky." Each month of an ideal year the three stars listed for that month are supposed to rise heliacally, while three others set heliacally. Horowitz elaborates on the accepted theory that the main specimen, "Astrolabe B," was composed in the same political context as *Enūma eliš* (commonly known as the Epic of Creation), namely as a reflection of the victory of Nebuchadnezzar I over Elam around 1100 B.C. Hitherto unexplained, seemingly anomalous features of Astrolabe B, such as the appearance of a star called *Nēberu* ("Crossing") in month XII, can be explained with reference to *Enūma eliš*. Horowitz stresses the multifunctional nature of the text, which serves as an astronomical treatise as well as a theological work. Given the highly schematized nature of the astronomical content, it may be even more strongly the latter than suggested by the author.

In his contribution "Calendars, Intercalations and Year-Lengths in Mesopotamian Astronomy," the late John Britton reviews intercalation practices and year lengths in Mesopotamia. After dividing Mesopotamian calendars into civil, administrative, and schematic calendars, he turns to intercalation, that is, the occasional insertion of an extra month in order to reconcile the lunar and solar cycles. Without intercalation, phenomena anchored to the year (equinoxes, solstices, heliacal risings etc.) shift backwards by about $365.25 - 12 \cdot 29.53 \approx 11$ days per year, 29.53 days being the mean synodic month. Figure 8 (p. 123) shows the Sun's tropical longitude on day 1 of month I (Nisannu) between 750 B.C., in the Neo-Assyrian Era, and 300 B.C., in the Seleucid Era. Britton makes a number of interesting observations concerning the spring equinox, when the Sun's tropical longitude is 0°. The dates, not shown by Britton, can be estimated from the longitudes in figure 8 by assuming a daily solar motion of 1°. If, for instance, the Sun's longitude on 1/I is −15° then the spring equinox falls on 16/I. Figure 8 reveals that, as early as the eighth century B.C., the spring equinox varied within a narrow thirty-day band of calendar dates, suggesting that intercalation was already a highly controlled phenomenon. Secondly, the midpoint of the thirty-day band slowly drifts from roughly 15/I in 750 B.C. to 15/XII in year 2 of Xerxes (484 B.C.). In that year the accurate nineteen-year intercalation cycle was adopted, causing the drift to come to a halt. Britton suggests that the drift reflects 1) a rejection of the Assyrian calendar preserved in, for example, MUL.APIN, in which the spring equinox occurs ideally on 15/I, and 2) a gradual return to the Old Babylonian convention preserved in, for example, *Enūma Anu Enlil* Tablet 14, according to which it occurs ideally on 15/XII. The question remains why the Babylonians, having decided to abolish the Assyrian equinox convention, would implement this over several centuries while they could have done so within a year by inserting one extra intercalary month. Furthermore, in the sixth century B.C., the short-term behavior of the equinox shows curious anomalies partly in a direction away from the assumed goal. It therefore remains to be seen to what extent the evolution of the Babylonian calendar was a deliberate process.

Next, Britton turns to Babylonian year lengths (pp. 125–31), their possible derivation from empirical data, and transmission to Greek astronomy. Year lengths are rarely mentioned explicitly in texts and must usually be derived from period relations or other astronomical parameters. A minor point concerns the three-year (thirty-seven month) intercalation cycle known from the astronomical text MUL.APIN, which is said to imply a 364-day year since $37 \cdot 29.53/3 \approx 364$ whole days. One might also argue that three years amount to $37 \cdot 29.53 \approx 1093$ whole days, which, divided by 3, yield 364 1/3 days as the implied year length. Britton dates the year length 365 1/6 days—mentioned in the astronomical procedure text BM 36712—to the early fifth century B.C. However, this tablet from Babylon can hardly be dated more accurately than 500–350 B.C., so that the mentioned year length may well be later than assumed by Britton.[2] The survey ends with a discussion of all year lengths, including those implied by the nineteen-year cycle and by lunar systems A and B (Fig. 10). Britton concludes that year lengths exhibit a systematic trend to higher accuracy. Since some of the assumed dates of the year lengths are open to debate, this trend may be less systematic than claimed.

John Steele ("The Length of the Month in Mesopotamian Calendars of the First Millennium BC") explores how the beginning of the month was determined in Mesopotamia. Steele begins by quoting evidence from a wide range of textual sources proving that the start of each month was defined by the first appearance of the lunar crescent shortly after sunset at the end of day 29 or 30. Before the first millennium B.C., this was established through observation. If the new crescent was not seen at the end of day 30 (e.g., because of bad weather), the first day of the new month was nevertheless declared that evening. The earliest evidence pointing to the prediction of the first crescent is found in Neo-Assyrian astrological reports, but the method of prediction, which is probably based on the circumstances of the immediately preceding Full Moon, is not really understood. No later than the early sixth century B.C., the so-called Goal-Year method was developed in Babylonia. This method, reconstructed by L. Brack-Bernsenn,[3] exploits the eighteen-year ("Saros") periodicity of the so-called Lunar-Six intervals for long-term prediction of the first crescent. Steele compares the month lengths reported in the Astronomical Diaries and other Babylonian observational texts from the Seleucid and Parthian Eras with those mentioned in contemporaneous Almanacs and Normal-Star Almanacs, which were predicted with the Goal-Year method (Table 3). Interestingly, they agree essentially 100%, much better than what would be expected if the data in the former group of texts would result from pure observation. Steele therefore concludes that the month lengths in the Astronomical Diaries were, in fact, also predicted by the Goal-Year method. Since the algorithms of mathematical astronomy (e.g., lunar systems A and B) would yield slightly different results, they were not used for these predictions. There are interesting implications, not only for our understanding of the Babylonian calendar, but also the purpose of Babylonian predictive astronomy. Since mathematical astronomy had no calendaric application, at least in the Seleucid and Parthian Eras, its purpose becomes even more elusive than previously thought.

Alexander Jones ("On Greek Stellar and Zodiacal Date-Reckoning") explores the usage of purely solar calendars by Greek astronomers. Jones traces these calendars back to lay traditions in which astronomical and weather phenomena are linked to the annual course of the Sun, as can be found, for instance, in Hesiod's *Works and Days*, several works from the Hippocratic corpus, and so-called parapegmata. This culminated in the "Dionysian Calendar"—named after an astronomer Dionysius, probably from Alexandria—in which the months are defined by the entry of the Sun into a zodiacal sign.

[2] For a new edition, cf. M. Ossendrijver, *Babylonian Mathematical Astronomy. Procedure Texts* (New York, 2012).

[3] L. Brack-Bernsen, *Zur Entstehung der babylonischen Mondtheorie* (Stuttgart, 1997); L. Brack-Bernsen and H. Hunger, "TU 11: A collection of rules for the prediction of lunar phases and of month lengths," *SCIAMVS* 3 (2002): 3–90.

Altogether this volume offers valuable accounts of current research on calendars in Ancient Egypt, Mesopotamia, and the Greco-Roman World. It can be recommended to anyone with an interest in chronology or the history of astronomy.

American Egyptologist: The Life of James Henry Breasted and the Creation of his Oriental Institute. By Jeffrey Abt. Chicago: University of Chicago Press, 2011. Pp. xix + 510 + 125 figs. + 4 maps. $45 (cloth).
Reviewed by Emily Teeter, *The Oriental Institute of the University of Chicago*

James Henry Breasted (1865–1935) was one of the towering figures in Egyptology and ancient Near Eastern Studies. He conducted epigraphic expeditions in Sudan and Egypt, he developed a method for making accurate copies of texts and inscriptions, he introduced the public to the concept that the roots of Western civilization lie not in the Classical world, but in the ancient Near East, and he wrote wildly popular books to support and disseminate his ideas. With the massive financial support of John D. Rockefeller, Jr., he outlined ambitious research plans for his Oriental Institute that included the monumental undertaking of the Chicago Assyrian Dictionary and a program of excavations throughout the Middle East. His legacy lives on through the University of Chicago's Chicago House in Luxor, an ambitious publication program, the Rockefeller Museum in Jerusalem, and the Oriental Institute in Chicago.

Jeffery Abt's meticulously researched and fascinating biography traces Breasted's life from his humble youth in Rockford and Chicago to his rise as the premier Orientalist of his time. The volume is a welcome supplement to the only other full biography of Breasted, *Pioneer to the Past* (1943), a near-hagiography written by Breasted's son Charles who spent his adulthood as his father's assistant. Abt has diligently scoured archives throughout the world to recount the arc of Breasted's career. Even those who are very familiar with the story will find surprises and new insights. What makes this volume especially interesting and valuable is Abt's recounting the influence that individual scholars had upon Breasted's career and the influence of Breasted on others, including Freud.

Considering Breasted's success, it is fascinating to note the uncertainty of his early career path as he shifted from pharmacy to the ministry and then finally to Oriental studies, along with a series of setbacks, dithering, and financial reliance upon his family, which was hard pressed to finance his career changes and advanced studies. Breasted always seemed to find a helping hand when it was needed most. Samuel Ives Curtiss of the Chicago Theological Seminary gave Breasted a firm grounding in Hebrew and redirected his student from the ministry to Oriental studies. As Breasted became aware of the mistranslations in the King James Bible and turned away from the ministry, Curtiss cautioned "You are torn . . . because the pulpit appeals emotionally to your imaginative and somewhat dramatic temperament. But intellectually, it confounds you with doubts which will only grow . . . You have the passion for truth which belongs to the scholar" (p. 9). Once on the path of Egyptology, Curtiss steered his student to William Rainey Harper, who became the first president of the University of Chicago. Curtiss, like Harper, had studied in Germany, setting an example for Breasted to follow. The rigors of the German academy appealed to Breasted and there his facility for languages proved itself, adding ancient Egyptian and Arabic (in later years Breasted taught Classical Arabic texts) to his German, Hebrew, Greek, and Latin. In 1894, he returned to the United States to assume the prestigious first lectureship in Egyptology at the new University of Chicago but with few students and a low salary.

In 1905, he initiated the first of two seasons of an epigraphic expedition to Sudan and Egypt funded by the General Education Board of the Rockefeller Foundation. This undertaking was a harbinger of his organizational ability and vision, considering that he had been to Egypt only once before, on his honeymoon in 1893–94. The expedition posed incredible logistical challenges in transporting huge amounts of supplies, including a cumbersome wooden box camera with its glass-plate negatives and chemicals. It was on that expedition that he recognized that combining photography with the trained eye of an epigrapher was the key to ensuring accuracy of the texts he was copying and that the addition of the camera provided