

first three are accepted cases throughout Semitic. The presumed dative and locative, however, are not. The form that the author claims to be the dative already in Proto Semitic, *-is* (later Akkadian *-iš*), is an adverbial ending, not a case. The adverbial ending *-is* can accumulate morphemes and occur with the locative adverbial ending *-um*, as in *kirīsum* “into the garden” (Hasselbach 2005: 181). Cases cannot accumulate morphemes in this way in Semitic. Furthermore, the author claims that in Old Akkadian, *-is* functions as a postposition. That this is a grammatical impossibility in Akkadian has been convincingly shown by Orin D. Gensler, “Mari Akkadian IŠ ‘to, for’ and preposition-hopping in the light of comparative Semitic syntax”, *Orientalia* 66, 1997, 129–56. These are just a few examples of problems faced in the grammatical sketch.

The text samples are useful and nicely presented. It would have been helpful to indicate which royal inscriptions are original and which are Old Babylonian copies. Many of the inscriptions provided are Old Babylonian copies, a fact of which the reader should be aware. The philological commentary is mostly very basic and the normalizations exhibit numerous typos; especially sibilants are confused (such as *ištum* for *istum* and *šunūti* for *sunūti*, p.102; and others).

To summarize, the book under review is a useful tool for introducing students to Sargonic Akkadian and the Old Akkadian period. The reader, however, should be aware that some of the claims made about Sargonic Akkadian grammar are problematic.

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THE NEAR AND MIDDLE EAST

SACHA STERN and CHARLES BURNETT (eds):

Time, Astronomy, and Calendars in the Jewish Tradition.

(Time, Astronomy, and Calendars: Texts and Studies.) xxi, 365 pp.

Leiden: Brill, 2013. €167. ISBN 978 90 04 25965 2.

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The dozen papers collected in this volume represent an important overview of current work on calendrics in the later ancient and medieval world, ranging from the reinterpretation of Qumran materials such as 1 Enoch 82 in Hellenistic-Roman Egypt (c. first and second centuries CE) to late medieval (fourteenth and fifteenth centuries CE) Ashkenazic works from northern Europe, although most of the contributions focus on the Arabic precursors to and the earliest phases of the so-called “*ibbur*” literature of the ninth to eleventh centuries CE. At the same time, the volume also represents the end of one phase of the overall work of Sacha Stern’s research group on calendrics at University College London as of 2013, when the AHRC-funded research project “Medieval Monographs on the Jewish Calendar” came to an end. Many of the papers are interim reports on larger editorial projects, while others are quite technical discussions of the mechanics of calendrical tables, so the volume as a whole is not for the faint of heart. Readers interested in making sense of some of the contributions, such as François de Blois’ “Some early Islamic and Christian sources regarding the Jewish calendar” or especially Raymond Mercier’s discussion of the “Astronomical tables of Abraham bar Hiyya” may want to revisit the introductory chapters of Olaf Pedersen’s *A Survey of the*

Almagest (the revised edition with annotations from Alexander Jones, New York, 2011) or one of the recent books on the history of spherical trigonometry from Glen van Brummelen (*The Mathematics of the Heavens and the Earth* (Princeton, 2009) or *Heavenly Mathematics: The Forgotten Art of Spherical Trigonometry* (Princeton, 2013)). For the much more tractable, later history of these materials in early modern Europe, in particular the fascinating role of calendars in religious polemics, see Elisheva Carlebach's beautifully illustrated *Palaces of Time: Jewish Calendar and Culture in Early Modern Europe* (Cambridge, MA: Belknap Press, 2011). Given the breadth of the materials contained in the volume, I will comment on just a couple of the issues raised.

One of the most interesting papers is Israel Sandman's "Scribal prerogative in modifying calendrical tables", since it raises the fundamental question of how knowledge embedded in diagrammatic forms such as "tables, diagrams, and similar elements that lie outside the main body of a work's text" (p. 113) can be either maintained or altered in the process of transmission. Sandman dutifully invokes Genette's term "paratext", but the phenomenon on which he focuses – the correlation between descriptive text and diagrammatic forms – has been the central pre-occupation of a number of researchers in the early history of mathematics and scientific thought, in particular in the English-speaking world: see for example the well-known book by Reviel Netz, *The Shaping of Deduction in Greek Mathematics* (Cambridge, 1999); also Bruno Latour's review "The Netz-works of Greek deductions" (*Social Studies of Science* 38/3 (2008)), 441–59, in comparison to that of Nathan Sidoli in *Educational Studies in Mathematics* 58, 2005, 277–82). But thanks to ongoing work in Europe, such as the numerous publications of Eleanor Robson on Mesopotamian tables and mathematics, the SAW Project in Paris, and in particular the discussions of Diagrammatik in Berlin (see S. Krämer, E. Cancik-Kirschbaum and R. Totzke (eds), *Schriftbildlichkeit: Wahrnehmbarkeit, Materialität und Operativität von Notationen* (Berlin, 2012)), the specific examples dealt with by Netz can now be situated in a broader history of diagrammatic reasoning that is substantially less Graeco-centric. These seemingly divergent resources now represent the basic toolbox for any discussion of diagrammatic reasoning in the ancient world. Unfortunately none of these theoretical materials are brought into Sandman's contribution, nor into the other contributions to the volume, and it must be said that the volume is poorer for their absence. Nonetheless, Sandman's own discussion is still interesting because it is formulated in specifically text-critical terms and raises the possibility of a new type of textual criticism for technical tables and other diagrammatic forms. In Sandman's description of Bar Ḥiyya's diagram of quadrants and inhabited climes, for example, the diagram is oriented in all four possible directions in different manuscripts, but crucially "in each instance of an [independently, JCJ] identifiable manuscript family, the family members share the same orientation" (p. 116). Sandman goes on to describe distortions in the tabular form of New Year and Passover dates in the 19-year Metonic cycle and here we see two competing forces in the context of transmission, viz. technical compliance to numerical parameters as opposed to the formal symmetry of their representation for a non-technical body of users.

This may seem like a fairly obvious result, but it actually points to a major issue in editions of technical compendia and handbooks, namely the role of implicit numerical parameters (and corresponding sets of more or less implicit rules) in the extremely small circles or chains of technical specialists who wrote these texts. The ability to construct or modify algorithms and to judge their differing results must be distinguished from the capability of a less accomplished scholar to apply an established algorithm in the correct way. Sidoli's recent suggestion

that this contrast is visible in the different role of mathematical tables in the *Almagest* and the *Handy Tables* (“Mathematical tables in Ptolemy’s *Almagest*”, *Historia Mathematica* 41, 2014, 13–37, esp. p. 28) offers us a model for how different levels of technical expertise are registered in textual forms, and several papers, especially Raymond Mercier’s discussion of Bar Ḥiyya’s tables, speak to the question of levels of expertise. The most accessible of these discussions, however, is probably Ilana Wartenberg’s description of the contrast between Bar Ḥiyya and his late eleventh–early twelfth-century CE contemporary Jacob bar Samson. As Wartenberg emphasizes these two authors differ in their ability to access the Arabic scientific tradition (Bar Ḥiyya yes, Bar Samson no) and also in the way that they approach technical issues: “Bar Ḥiyya . . . provides numerous algorithms to verify the result of the *molad* calculation and he explains the logic behind it. Bar Samson does not go much beyond providing dry, technical rules” (p. 108). Here we have a solid example of the same contrast in levels of expertise that Sidoli postulates for users of the *Almagest* and the *Handy Tables*, and the crucial factor for Bar Ḥiyya (like Ibn Ezra) seems to have been his ability to interact with Arabic materials. We can only hope that the new editions of works by Bar Ḥiyya and Bar Samson, currently being prepared by Sandman and Wartenberg, will continue this important line of work on the textual criticism of technical literatures and diagrammatical forms. The volume as a whole represents an important contribution to ongoing work on ancient calendrics and no doubt Sacha Stern’s research group at UCL as well as Charles Burnett’s extensive work on Arabic traditions in medieval Europe will continue to foster efforts such as this in the coming years.

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MAURO ZONTA:

Saggio di lessicografia filosofica araba.

(Philosophica. Testi e studi.) 330 pp. Brescia: Paideia Editrice, 2014.

€34. ISBN 978 88 394 0865 5.

doi:10.1017/S0041977X1500018X

This work brings to completion Zonta’s studies on Arabic philosophical terminology started over twenty years ago with the publication of *Un dizionario filosofico ebraico del XIII secolo. L’introduzione al «Sefer De’ot ha-Filosofim» di Shem Tob ibn Falaquera* (Quaderni di Henoch. Turin: Zamorani, 1992). The two aims of the book are stated in the preface (pp. 9–10). First, it documents in detail, especially on comparative grounds, the well-known and thoroughly researched thesis according to which the relationship between Arabic and Greek philosophy depended upon the mediation of the Syriac philosophical and religious literature and translations from Greek into Syriac carried out by Christians. Second, it introduces an intriguing and hitherto rather neglected thesis: that of the possible influence on philosophical Arabic terminology of the languages which convey the culture not only of the Near East, a heavily Hellenized area, but also of the Middle East and Asia. The Islamic world had cultural relationships with these eastern regions beginning in the eighth century. An essay on the *status quaestionis* of these two issues opens the volume.

Zonta refers in his analysis of the philosophical Arabic terminology to: Greek, Syriac, Classical and Medieval Latin, Classical Armenian, Classical Georgian,

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