

ture of the *exp.*—not an unreasonable course, given the diffusion of Stoic terminology and doctrinal elements that had reached Middle Platonic authors by the early centuries CE—S. acknowledges that further research may strengthen the assumption of a Stoic influence on the *exp.*

In sum, S.'s volume is a significant contribution to our knowledge of Roman philosophy in the early centuries CE, and the intriguing parallels he identifies between the *exp.* and Apuleius' *DPD* will energize the debate surrounding the author's *philosophica*. While I do believe that S. has a good case in hypothesizing an Apuleian authorship for the *exp.*, given the extent of variation in both works' treatment of certain dogmata and, on occasion, in both works' use of terminology, it appears unlikely to me that this would have occurred at the time Apuleius composed the *DPD*, or with a view to integrating the *exp.* into this work.

The book closes with an appendix on Al-Fārābī's *Philosophy of Plato*, written by Coleman Connelly, which makes for an interesting excursus that invites further research concerning the peculiar genre of the *exp.* Connelly argues that the discovery of this work sheds new light on an earlier conjecture, first advanced by Franz Rosenthal and Richard Walzer in their edition of Al-Fārābī's *Philosophy of Plato*, that a Middle Platonic compendium, similar in genre to the *exp.*, may have been the author's source. Connelly defends this conjecture against more recent views that assume a close connection between Al-Fārābī's work and Galen's Platonic compendia. Advancing the *exp.* as a representative of the genre of Middle Platonic exposition, according to Connelly, strengthens the assumption that Al-Fārābī's *Philosophy of Plato* originated from the same tradition.

*Christina Hoenig*  
*University of Pittsburgh*

*Roman Portable Sundials: The Empire in Your Hand.* By RICHARD J. A. TALBERT. Oxford and New York: Oxford University Press, 2017. Pp. [vii] + 236.

Roughly five hundred Graeco-Roman sundials of the kind intended to stand in a fixed position are known to survive, and they also figure in literary references, inscriptions, and visual representations. Graeco-Roman portable sundials are rarer and far less familiar objects; a recent inventory lists just twenty-five, dating from the first century CE through late antiquity.<sup>1</sup> Like conventional sundials, they existed in diverse types that were nevertheless unified by the fact that their designs embodied a scientific definition of seasonal hours—equal twelfths of the time from sunrise to sunset—in terms of mathematical astronomy. During the course of any day, the sun's position in the sky changes continuously in both altitude (the vertical angle above the horizon) and azimuth (the horizontal angle from a reference direction, say due south). A conventional sundial has to be accurately aligned with due south, uses a shadow point or a narrow beam of sunlight to track both dimensions of the sun's apparent motion, and yields two chronological "outputs": the seasonal hour of the day, and the date within the year in relation to the solstices and equinoxes. A portable sundial, since it was intended for use

1. Karlheinz Schaldach, "Measuring the Hours: Sundials, Water Clocks, and Portable Sundials," in *Time and Cosmos in Greco-Roman Antiquity*, ed. Alexander Jones (Princeton, NJ, 2016), 63–93, esp. 91.

in situations where one would not accurately know the cardinal directions, can only track the sun's altitude; hence to use it one had to know the date already, and the seasonal hour was the only output.

Conventional sundials were always designed for a particular terrestrial latitude, and the same is true of some portables, including what are probably the two oldest extant ones, the well-known bronze "prosciutto" from the Villa dei Papiri at Herculaneum, and a pillar sundial made of deer bone, found in a late-first-century CE tomb of a physician at Este. Some, however, extended the principle of portability by allowing for use at several latitudes through a set of interchangeable display disks inscribed with customized hour grids, in a manner similar to medieval astrolabes. But the largest group, comprising thirteen known examples, were truly "universal," since they had movable elements that could be set to any latitude. Most commonly they consisted of a rotatable bronze disk inserted in a rimmed casing to allow for the latitude setting, and a cursor that could pivot to allow for the date setting while serving as both gnomon and hour scale. Once it had been appropriately set, one would dangle the sundial vertically by a wire or chain in the sunlight, in such an orientation that the gnomon's shadow fell upon the hour scale to indicate the time.

Richard Talbert's *Roman Portable Sundials*, the first monograph devoted to these remarkable objects, is chiefly concerned with those that were adaptable to multiple or arbitrary latitudes, and the focus of his interest in them is not their time-keeping function but rather the geographical data with which they are inscribed in Latin or Greek, which in the case of the universal sundials take the form of lists of place names with associated latitudes in degrees. The lists range from twelve up to thirty-six places: cities, but also entire provinces and regions, for which a single latitude is always given regardless of their north-south extent. No two lists are identical in their choice of places, and the latitudes assigned to the same place in different lists often vary. For T., the lists are precious witnesses to the geographical awareness of their makers and owners.

The heart of the book is its second chapter, in which the sixteen known portable sundials with geographical inscriptions are described and illustrated. (It is a pity that T. did not take the opportunity to do the same for the remaining few portables, though three are discussed on pp. 10–14, and the "prosciutto" is glancingly mentioned in a footnote on p. 120.) Four are lost, so that we depend on drawings or old photographs.<sup>2</sup> Nine have at least a reported (sometimes imprecise) findspot: among those with Latin inscriptions Rome, Aquileia, Crêt-Châtelard (Loire), Bratislava, Amiens, and Mérida, and among those with Greek inscriptions Memphis, Aphrodisias, and Philippi—in other words, they existed throughout the Roman Empire. (Interestingly, only the dial from Memphis includes its own findspot in its geographical list.) The ex-Time Museum dial (T.'s no. 10), though unprovenanced, surfaced in the 1970s in the scientific instruments trade as part of an ensemble of late Roman surveying instruments, a probable indication of the professional status of its ancient possessor. None can be dated with any precision, though the lists of places provide some clues; in particular, six of the eight dials inscribed in Greek—but, curiously, none of the eight in Latin—have Constantinople.

2. T.'s no. 4 ("Aquileia"), said to be lost, is extant in the Civico Museo di Storia ed Arte, Trieste, inv. 5423 (low-resolution photographs are on the museum's website). On the other hand, T. provides up-to-date information on the present location—in the Palazzo Massimo—of his no. 2 ("Kircher Museum, Rome"), which has been indicated as lost in some previous lists of portables.

The readings of the geographical inscriptions, crucial for T.'s investigations, have surprisingly few gaps or uncertainties, though a few details will doubtless be clarified in the future where T. has had to work from less-than-ideal photographs.<sup>3</sup> Certain dials (the ones with interchangeable disks as well as no. 16, "Balkans") do not associate numerical latitudes with the listed places, but the assumed latitudes can be deduced at least approximately from the inscribed lines; T. does not provide these latitudes, though some of them can be found in publications that T. cites.<sup>4</sup>

T. makes a persuasive case that the practice of specifying latitudes in degrees on portable sundials was ultimately inspired by Ptolemy's *Geography*. Not that Ptolemy was the first to express terrestrial longitudes and latitudes in degrees; his principal source, Marinus of Tyre, did so too, as is clear from a passage quoted in *Geography* Book 1 chapter 7. But Ptolemy used such coordinates on an unprecedented scale, and his *Handy Tables*, which incorporates a "Table of Noteworthy Cities" extracted from the *Geography*, achieved a wide distribution within a century of his own time. The actual latitudes on the sundials sometimes match Ptolemy's, though some of these were already well-established parameters long before Ptolemy, for example, 36° for Rhodes and 31° for Alexandria. Frequently the sundials give latitudes diverging from Ptolemy's, in some instances perhaps because of errors of transmission but sometimes clearly betraying other sources.

Constantinople is an interesting case. Ptolemy retained from Hipparchus the assumption that Massalia and Byzantion both lay on the parallel on which the longest day of the year lasts 15 1/4 hours, which is (by Ptolemy's calculation) 43° 5'—reasonably accurate in the former case, but spectacularly off in the latter, since the correct figure is almost exactly 41°. Long after Constantinople had become the intellectual center of the eastern Empire, Ptolemy's false latitude was accepted, and astronomical tables computed for the "*klima* of Byzantion" at 43° 5' were added to the *Handy Tables*, probably by Stephanos of Alexandria in the early seventh century. The accurate latitude 41° for Byzantion/Constantinople appearing on the eleventh-century Brescia astrolabe (the only extant Byzantine astrolabe) and in Greek astronomical texts from about the same date has been plausibly explained as a transmission from Arabic sources. But while three or four of the portable sundials put Constantinople at 43°, two others have 41°, and this surely preserves a competent measurement that perhaps also had a circuitous survival in the Arabic geographical tradition.<sup>5</sup>

T.'s discussion of "margins of error" in telling time by portable sundials (pp. 141–46) introduces a topic to which the mathematics and astronomy underlying them have something to contribute. As T. observes, several factors come into play, including the accuracy of the assumed latitude, the precision with which one could set a graduated instrument of small dimensions to the assumed latitude and time of year, and the stability of the sundial while it is being suspended—this last perhaps not too serious a problem for a prac-

3. Photographs made of the ex-Time Museum dial following its recent exhibition at the Institute for the Study of the Ancient World show that the place conjecturally restored by T. as Coele (Syria), at latitude 36°, is actually Rhodes (ΡΟΔΟΣ), and that the latitude assigned to Germania is 51 (NA). All T.'s other readings and restorations for this dial are confirmed.

4. In the case of no. 4, "Aquileia" (see n. 2 above), the latitudes implied for the places designated only by the abbreviations "RO" and "RA" are respectively about 36° and 38°, which makes their long-standing identifications as Rome and Ravenna unlikely. "RO" might be Rhodes.

5. T. reads the latitude on no. 9 ("Samos") as 40 1/3 (M Γ'). There is no space between the letters and no stroke indicating a fraction is visible in the photograph, so I suspect this is simply the Ptolemaic 43 (MI) again, with the horizontal stroke of the gamma shortened by wear around the disk's edges.

ticed user unless the weather was gusty. Since the solar altitude on which the measured time solely depends changes rapidly near sunrise and sunset but slowly around noon, times between the fifth and seventh hours would always be tricky to determine accurately. But what would happen if one tried to use the sundial after setting it to a latitude a few degrees off?

The question has a more familiar counterpart: how would a conventional sundial behave if, as in the reported case of the sundial moved in 263 BCE from Catania (latitude  $37^{\circ} 30'$ ) to Rome (latitude  $41^{\circ} 50'$ ), it was installed in correct orientation but at a latitude several degrees off the one for which it was designed? At first glance one might suppose (as T. seems to, p. 143) that the sundial would indicate an erroneous length for the midsummer and midwinter days—a maximum discrepancy of about half an hour for the sundial transplanted from Catania. In fact, practically all varieties of ancient sundial would display the correct local seasonal hour at sunrise, noon, and sunset irrespective of the latitude of installation. The timing errors for the intermediate seasonal hours would be on the order of a few minutes, scarcely detectable unless one had a trusted second sundial or clepsydra to compare with. Where a displacement of four or five degrees *would* be noticed is in the paths traced by the gnomon's shadow through the day, which would not follow the inscribed day curves; in midsummer at Rome the shadow on the Catanian sundial would never quite reach the summer solstice curve, while in midwinter it would fall outside the winter solstice curve.

The situation for a universal portable sundial is different. Here the sundial is set by the user to the maximum (noon) altitude of the Sun for the current date, a quantity that incorporates both the assumed latitude and the solar declination for that date. If this maximum altitude is accurate, unless the date is an equinox, there will still be modest errors in the displayed seasonal hours at all times except sunrise, noon, and sunset because the mathematical theory underlying the sundial's design is only approximate.<sup>6</sup> Additional timing errors caused by inaccurate setting of the latitude would normally be on the order of a few minutes early and late in the day, but around midday there would be more obvious indications that something was wrong. If the sundial is set to too great a maximum altitude (e.g., by assuming a too southerly latitude), the sundial will never quite indicate noon, whereas setting it to too small a maximum altitude will result in noon being indicated too early, followed by an interval during which the shadow will not fall on the scale at all. However, a user noticing one of these problems could employ the sundial to determine the correct local latitude, by setting the sundial to the date and adjusting the latitude setting so that it reads noon at any time reasonably close to actual noon. In other words, one didn't really need a geographical list at all, because the sundial itself is an instrument for measuring latitude!

A well-made portable sundial, properly used, would have been a reasonably effective way of estimating the time in seasonal hours in situations where no conventional sundial was available. One can imagine the physician of Este using his pillar dial to record times of onset of fevers for diagnostic purposes or to prescribe optimal times for administering meals during his visits to patients, perhaps indeed making a conspicuous display of this cutting-edge technology; and a surveyor too might have practical uses for telling time when at work at a distance from developed towns, if only to be mindful of how much day-

6. M. T. Wright, "Greek and Roman Portable Sundials: An Essay in Approximation," *Archive for History of Exact Sciences* 55 (2000): 177–87.

light remained. In balancing the claims of utility against show as motivations for owning a portable sundial, T. inclines a little more on the side of show than I would. (He offers Trimalchio as his idea of the quintessential possessor!) But for the most part the geographical lists on the universal dials would have contributed nothing to the dials' practicality. Leaving to one side the inaccuracy of many of the cities' latitudes, what was a traveler to do when passing through a locality not on the list? Or what are we to make of a list like that of no. 7 ("Oxford"), which consists almost entirely of entire provinces, some of them spanning many degrees of latitude but each assigned a single figure which sometimes best represents a central location (e.g., Italia at 42°), sometimes an extreme one (e.g., Egypt at 30°)? At best these figures could serve as a first approximation that would have to be refined by on-site trial-and-error adjustment.

Hence T. is surely right to see the lists as artifacts less of actual travel than of geographical imagination. But whose imagination? To begin with, we can assume that there existed at any time during the later Roman Empire several workshops specializing in making precision instruments of bronze: not only portable sundials, probably, but medical instruments and other devices that involved well-crafted components such as the nested movable disks of a universal dial. A shop could keep to one basic design, while perhaps offering different sizes—the extant universal sundials have diameters ranging from less than six centimeters, exquisitely tiny, to about twice that. Given the common destiny of ancient metal objects to go into the melting pot when they were no longer wanted, the number that have come to light in modern times implies that they were not fabulously rare things, but that they would have been special enough that a shop would not have mass-produced them, but maybe had one or two in stock to show prospective customers who would typically have commissioned something custom-made. The geographical list—no portable sundial complete without one—was the most customizable element. The shop might have a big list of localities with their latitudes to choose from, and prices varying according to whether the customer wanted just twelve, or thirty, or thirty-six. One customer (no. 9, "Samos") picked out a list limited to localities in western Asia Minor and nearby islands. More typically, the selection was wide-ranging and might include fantasy-destinations such as Babylon, Meroe, even India, to which the possessor would surely never travel, but how impressive to show off a sundial that would work even there! And did the surveyor-owner of the ex-Time Museum dial ever idly contemplate its list, wondering what it would really be like to visit the Thebaid or sunny Spania or chilly Germania?

Of course the lists could not fully function as ersatz maps since a single coordinate is not enough information to convey how one place is situated relative to another. Some are simply in order of increasing latitude. However, no. 8 ("Aphrodisias"), as T. shows, traces a plausible Grand Tour that descends the Nile, follows the north coast of Africa to Carthage, doubles back by way of Crete and Greece to Asia Minor and the Levant, and finally traverses the Mediterranean westward to Sicily, Italy, Gaul, and Spain, implying that the compiler was guided by at the least a mental map. Not surprisingly, the lists inscribed in Greek have a bias favoring the eastern Mediterranean, whereas in the Latin ones Europe predominates. A less obvious characteristic of the Latin lists is the fewness of cities as opposed to provinces. The world according to the sundial-makers was not quite confined to the Empire—Meroe, Babylon, and Sarmatia all figure in more than one list—but, with the sole exception of India on no. 3 ("Memphis"), Asia east of Babylon is entirely absent. This is a striking omission when one compares the

sundials with other wide-ranging geographical lists such as astrological geographies or even *Acts* 2:9–11's inventory of foreigners in Jerusalem at the Pentecost.

Ancient time-keeping devices provided one of the most prominent contexts in which holders of expert knowledge—mathematicians, astronomers, geographers, and mechanics—came into broader public view, and it is a good development that, alongside the technically oriented scholarship treating these devices as scientific objects, recent work has brought a new emphasis on their cultural roles.<sup>7</sup> With this thought-provoking volume T. demonstrates that the Graeco-Roman portable sundials are not just a curious byway of early time technology, but a reflection of a society that was deeply conscious of geographical space as well as measurable time.

Alexander Jones  
New York University

7. Notably Jérôme Bonnin, *La mesure du temps dans l'Antiquité* (Paris, 2015); Eva Winter, *Zeitzeichen: Zur Entwicklung und Verwendung antiker Zeitmesser*, 2 vols. (Berlin, 2013).

*Reproducing Rome: Motherhood in Virgil, Ovid, Seneca, and Statius.* By MAIRÉAD MCAULEY. Oxford Studies in Classical Literature and Gender Theory. Oxford and New York: Oxford University Press, 2016. Pp. [xii] + 449.

Mairéad McAuley's monograph, a revised version of her Cambridge Ph.D. thesis, is a sprawling and ambitious exploration of motherhood in imperial Roman literature from Vergil and Ovid to Statius via the younger Seneca. She investigates the kaleidoscopic relationships between the representation of mothers and myths or symbols of the maternal in a variety of genres—epic, tragedy, prose consolation—from the early Empire and interrogates maternity in these texts as, on the one hand, reflection/construction/subversion of ideals and/or anxieties of motherhood in the Roman world and, on the other hand, distortion/displacement of anxieties about fatherhood and/or other power relations. The resulting volume is an extraordinarily sophisticated and variegated series of studies, loosely interconnected, of the literary dynamics of “the maternal” in four male authors central to the Roman literary canon.

M. sets out the parameters of her project in an “Introduction” that justifies her choice of authors and texts, theoretical and methodological apparatus, and historical period of study. As she notes (p. 7), her focus on the male-authored literature of the early Empire precludes giving voice to the “real” Roman mother; nor does she offer a full-fledged account of the maternal symbolic in the reproduction of a hegemonic imperial Roman identity. Truth be told, her choice of authors is remarkably conservative for such a daring theoretical project as she has pulled off in *Reproducing Rome*. But she has chosen her corpus for maximum engagement with scholars of European literature, history, and feminism, well beyond the borders of Roman antiquity, and her theoretical commitments confirm her ambition to secure a wider audience than professional classicists. Throughout this thought-provoking book, she engages with French feminist, psychoanalytic, and postmodern, often deconstructionist, theories of femininity and maternity, endeavoring not only to expose the familiar patterns of patriarchal stereotyping in Roman imperial literature, but also, more importantly, “to ‘release’ a maternal perspective” or “maternal subject in ancient texts” (pp. 26–27). The most stimulating discussions of the book are precisely those which document a struggle or tension in Latin literary texts