Teone di Smirne. Expositio rerum mathematicarum ad legendum Platonem utilium. Introduzione, traduzione, commento by Federico M. Petrucci

Studies in Ancient Philosophy 11. Sankt Augustin, DE: Academia, 2012. Pp. 609. ISBN 978–3–89665–550–9. Paper €44.50

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Editorial and academic rules are a bit different on either side of the Alps and that is fortunate for researchers and scholars. Here is Theon of Smyrna smartly propelled into the foreground, thanks to a 27-year old researcher, Federico Petrucci, by the way of his Italian translation with commentary following the current text *antiquo modo*. Exhaustive research underpins references, parallelisms, contrasts, and alternative or divergent ways of interpretation: meticulous footnotes in the introduction and commentary draw just as easily on the Arabic tradition and medieval literature as on late Antiquity or modern authors. Synoptic tables [46–49, 52–53] on musical and astronomical topics, then arithmetic [542–552], and again astronomy [553–555], are precious tools showing how easily the author can read and mine ancient texts for answers.

The book consists of 609 pages printed in small and rather squeezed characters with narrow margins. In a strictly alphabetical order, the bibliography (18 pp.) displays together editions of ancient texts, books with general contents, papers on special issues, in all the 'topics concerned'. There is an index of ancient sources (20 pp.), an analytical index (13 pp.) where one can find: both general and technical terms and among them ancient authors' names (*sic*) with differentiated references to the translation or to the commentary, and lastly a brief list of Greek terms (2 pp.), i.e., a limited selection of concepts, sometimes without the translations used in the work.

The introductory presentation (53 pp.), which is very condensed, is followed by philological notes on the text and translation (38 pp.) that are argued in the same scrupulous way in order to justify or to refute the emendations put

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forward in previous editions and translations.<sup>1</sup> The Greek text (96 pp.) is in fact given as an undivided, continuous whole which includes the emendations that have been accepted as well as the diagrams from Hiller's Teubner edition [1878]. This text is not lineated anew: the page and line numbers (marked in fives) of Hiller's edition alone are given in the right margins. The Italian translation (86 pp.) is given too as a continuous whole without any title or even blank spaces inserted to articulate the sections of Theon's treatise (the introduction and the accounts of arithmetic, music, and astronomy). Hiller's page and line numbers (marked in tens) are given in brackets within the translation itself.

Every heading of the commentary (229 pp.) thus begins with the page and line numbers of Hiller's edition, so that it compels you to refer to the text and the corresponding translation: bookmarks or post-its required! Nevertheless, in the commentary, four subtitles indicate the sections of the Theon's book; and some underlined page and line numbers at the beginning of some paragraphs indicate (but not always) the great divisions proposed in introductory presentation: I [19], II [21–22], III [26], IV [31].

Three appendices follow and supplement the commentary. The last (5 pp.) concerns Theon's traditional mathematical style and wonders about some inaccuracies; the second (6 pp.) focuses on the quotation of Plato's muth of Er in order to show that many variants fall outside the scope of the 'Art of Misquotation' and must have an 'ideological' reason that is in keeping with the goal of 'Platonem ex Platone σαφηνίζειν' [536]. And the first (16 pp.) studies in detail the parallels to Calcidius' commentary—without any mention of Béatrice Bakhouche's works 2012—and how Theon uses Adrastus of Aphrodisias' Commentary on Plato's Timaeus. Petrucci here adopts the same procedure as in his commentary, 'following the current text', and refers at last to one of his papers that is 'more complete' on this topic [530n34]. The complexity of the arguments and the thickness of their presentation probably explain why, in his translation, he gave up printing quotations of Adrastus in italics as he does for those of the other authors or forgoes marking them off with brackets following Delattre Biencourt 2010. As a result, there are occasional missteps in the commentary when Petrucci ascribes to Theon arguments explicitly imputed to Adrastus and goes so far

<sup>&</sup>lt;sup>1</sup> E.g., Boulliau 1644, de Gelder 1827, Martin 1849, Hiller 1878, Dupuis 1892, Smyly 1907, Tannery 1912, Barker 1989, and even Delattre Biencourt 2010.

as to accuse Theon of discrepancy when Theon actually keeps himself aloof from the quotation just given.

However, as the author explains most pertinently, one of the main aims of Theon's astronomical writing is to help the reader to perceive what differentiates the pattern of Platonic theorizing in astronomy that he promotes (viz., that the planetary motion, both direct and retrograde, are true motions in accordance with the rotation of the circle of the Other, itself opposite to that of the Same) from Adrastus' Peripatetic view (viz., that the planetary motions which we observe are apparent motions, a  $\varphi \alpha v \tau \alpha \sigma' \alpha$  [see Delattre and Delattre 2006] or  $\varphi \alpha v \dot{\varphi} \mu v v v$  to be accounted for), though Theon nevertheless uses Adrastus' account to a great extent.

The scrupulously traditional tone of this remarkable academic book will on occasion astonish or even disappoint the curious or interested reader. For example, the choice to preserve the Latin terms (which Dupuis used in his translation at the end of the 19th century) for the fractions of 'one and one part more' (as Luc Brisson [1992] translated «ἐπιμόριος») for both the intervals of tone (9:8) and the fifth (3:2) casts the text in an old fashioned style. Why not use the Greek terms, as he uses 'epitrite' for the interval of fourth (4:3) and 'epimere' for the fraction of 'one and several parts more'?

Similarly old-fashioned is the choice to preserve the Latin title of Hiller's edition without translating it on the first page—though the cover suggests Greek in that it is illustrated with an image of a splendid fragment from the frieze of the Parthenon in Athens—and of designating Theon's treatise in the following pages by 'Expositio' but no more. The author gives us the Greek text of the titles in manuscripts A and B only [9n2], and stays silent about the possibility that the title translated by 'Expositio' ('Presentation') might come from reading « $\chi \rho \eta \sigma (\mu \alpha)$ » instead of « $\chi \rho \eta \sigma (\mu \omega)$ » in B [see Macadam 1969].

But the main subject of 'Platonic ire', as Amyot said in translating Plutarch, is due to the dismissal of alternative interpretations of Theon's harmonic and astronomic theories [see, e.g., Delattre 1998, Delattre and Delattre 2003] as 'completely inopportune' and labeling them 'in chiave mecanica' [43] without any kind of debate or trial.

Petrucci's commentary goes on as if there were *no Platonic spheres* built in order to support repeated investigations about the directions (front or back) of the direct and contrary movements which might be the most appropriate

to account for the observed appearances, and which might, at the same time, help research into the points at which the whole system is stabilized. He reads the musical section as though there was *no Pythagorean musical canon graduated* in order to allow sliding the bridge above or under the string, thus making it possible to complete the intervals between fixed notes with adjusted, moveable ones. Moreover, according to Petrucci, the arithmetical section needs *no table of numbers at all* which might permit direct reading [see Bertier 1978, 40ff] of the consonances, their multiples, and above all the harmonic intervals squaring with them. Petrucci manages to comment on the 'plainly arithmo-geometrical' nature of Theon's arithmetic [332 ff.] without any reference to Maurice Caveing's works [see 1997 on arithmogeometry]. And he even draws attention to the risk of 'superinterpretation of the book' [336n139] that would claim for the Middle Platonist a deeper knowledge of the implications (and of the technical uses) of the matter dealt with. Petrucci does prefer a 'light reading'!

So we should not lay great stress on the light and surreptitious translation of the recurrent phrase in Theon's astronomical section, «κατὰ συμβεβηκός», once more translated literally by the Latin phrase 'per accidens' as medieval astronomy passed it on, without taking any notice of Martin's detailed note on this subject.<sup>2</sup> To pass over this last difficulty in complete silence cannot be 'accidental'! However, it produces a bit of wavering in the comments again: thus, on page 483, the author admits that

the pattern of the eccentric circles would follow the pattern according to the epicycles *per accidente* (that is, would be necessarily implied by it)

but on page 496, he only recalls the demonstration (as a partial one) of 'the accidental coincidence of the eccentric pattern with the epicycle's one' and nothing else.

The very judicious choice of displaying in a comparative tabular form the main objects of research or  $\zeta\eta\tau\eta\mu\alpha\tau\alpha$  (in music and in astronomy) according to their order of appearance in Plato's *Timaeus* and in the pages of the *Expositio*, with their 'technical' and 'exegetical' treatments face to face, underscores two other evasions. First of all, the way in which Theon tackles the different points is far from following the order in the *Timaeus* and

<sup>&</sup>lt;sup>2</sup> See Note X on ch. 22 [Martin 1849, 368–370], which is translated into French in Delattre Biencourt 2010, 405–408.

the differences fit in exactly with the rewriting and the resetting of Plato's discourse by the Middle Platonist commentator, a fact which the author does not appreciate sufficiently because of his comments 'along the current text'. Then, the systematic use of the series of ζητήματα appears as a matter of fact to reorder Theon's speech in a more traditional way at the risk of overshadowing his originality. There is no doubt, of course, that Theon explicitly draws on a widely exploited tradition and on many diverse technical sources (Neopythagorean and Eratosthenian in arithmetic and harmonics, Hipparchan and Eudoxan in astronomy). But is there no chance that Theon's practice of Middle Platonic exegesis [see Dillon 1977]—while carefully taking a middle course between the commentary of Adrastus the Peripatetic, which he quotes and criticizes at greater length, and that of Dercyllides the Platonist, whom he refers to in a more expeditious yet also critical way—might claim some measure of originality? According to the author [60n178], it is a double feature of Middle Platonic exegesis that it takes up both 'the extension of the exegetical reformulation to the philosophical consequences of the Platonic writings' and 'the possible widening (without fear of falsification) that attributes to Plato the whole corpus of technical knowledge', which actually allows one to reaffirm 'paradoxically' Plato's authority [61].

On one side, the 'extension to the consequences' is rather easy to perceive, for example, in the treatment of Theon's long quotations of Plato with the metaphor of the dyers as well as in the parallel of learning the scientific disciplines and the stages of initiation into the Musteries. On the other side, the 'falsifying widening' is far from being so evident. The most blatant example of astronomical error and hotchpotch perpetrated by Theon is most likely his effort to tell apart 'with more accuracy' [Hiller 1878, 172.22] three 'very close' measures of the periodic return of the Sun to the same point, a return that 'most of the mathematician astronomers look upon as equal to 365 days and a quarter'. The commentators ramble on about this so as to prove Theon's scientific incompetence or the 'low level' of competence in his sources. Petrucci examines all that with the greatest care [485–486nn587–588]. But why does he here confine himself to only the technical arguments instead of wondering which 'exegetic reformulation' this error might correspond to? It is hardly conceivable that these different periods for the return of the Sun to the same point fit in with the diverse astronomical appearances of its motion, nowadays better known and precisely measurable, because, in fact, the values of 365  $\frac{1}{2}$  and 365  $\frac{1}{6}$  days are more

likely different values in the measure of one and the same *phenomenon*, a fact which is at the heart of the reform—still recent for Theon—of the Roman calendar. Actually, these narrow differences afford to the Middle Platonist commentator the occasion to introduce strange solar periods of two, four and eight years  $(2, 4 = 2^2, 8 = 2^3)$ , periods that are plainly 'theoretical' at this point, so as to link them and the Sun's motion in longitude along with its 'theoretical' motions in latitude and depth 'in a more accurate way', that is to say, to link them in accordance with the progression of numbers in the right branch or first Platonic *tetraktys*  $(1, 2, 2^2, 2^3)$  of the ' $\Lambda$  of seven numbers' used by Plato and all his followers to organize and calculate the fundamental harmony of the world's soul.<sup>3</sup> It is not so clear whether this 'theoretical reformulation' of these three different measures of the solar year in a strictly Platonic speech was only a 'falsifying widening'. But it is true that it intended to reaffirm Plato's authority 'paradoxically'.

It is not useful to go on through the other detailed comments. We must recognize unhesitatingly the meticulous quality of this significant publication, which has been brought to completion so very quickly, and the undeniable utility of this rich and well-documented, academic work provided by a young and quite learned researcher for all the connoisseurs—mathematicians, musicians, astronomers, philologists, or philosophers—of the Middle Platonist Theon of Smyrna.

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<sup>&</sup>lt;sup>3</sup> The second Platonic *tetraktys* is 1, 3,  $3^2$ ,  $3^3$ .

<sup>&</sup>lt;sup>4</sup> Arithmetic and music only.

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