

## Byzantina Symmeikta

Vol 27 (2017)

BYZANTINA SYMMEIKTA 27



**Book Review: EMMANUEL PASCHOS - CHRISTOS SIMELIDIS, Introduction to Astronomy by Theodore Metochites (Stoicheiosis Astronomike 1.5-30), Singapore - Hackensack, NJ: World Scientific 2017**

*Ioannis TELELIS*

doi: [10.12681/byzsym.14340](https://doi.org/10.12681/byzsym.14340)

Copyright © 2017, Ιωάννης Τελέλης



This work is licensed under a [Creative Commons Attribution-NonCommercial-ShareAlike 4.0](https://creativecommons.org/licenses/by-nc-sa/4.0/).

### To cite this article:

TELELIS, I. (2017). Book Review: EMMANUEL PASCHOS - CHRISTOS SIMELIDIS, Introduction to Astronomy by Theodore Metochites (Stoicheiosis Astronomike 1.5-30), Singapore - Hackensack, NJ: World Scientific 2017. *Byzantina Symmeikta*, 27, 413–423. <https://doi.org/10.12681/byzsym.14340>

E. A. PASCHOS – CH. SIMELIDIS, *Introduction to Astronomy by Theodore Metochites* (Stoicheiosis Astronomike 1.5-30), Singapore–Hackensack, NJ: World Scientific 2017, 400 pp., with four unpaginated color figures. ISBN 978-981-3207-48-6 (hardcover); ISBN 978-981-3207-50-9 (ebook)

Byzantine astronomy is a special research field in the Byzantine studies. Scholarly interest in Byzantine astronomy was already expressed in the early 20th century with the inclusion of the relevant bibliography within the bibliographic section of the *Fachwissenschaften* (together with mathematics, natural science, medicine etc.) in the *BZ* from volume 9.1/1900 onwards. However, despite this early scholarly interest in Byzantine astronomy, the publication of critical editions of Byzantine astronomical texts was rather limited, at least until the 1980s. As R. Browning admitted in the XVI. International Congress on Byzantine Studies (Vienna, 1981): “though we possess an admirable catalogue of Greek astrological manuscripts, the result of exemplary international cooperation, many Byzantine astronomical texts are unpublished or exist only in unsatisfactory editions”<sup>1</sup>. Ever since, the bibliographical gap in the edition of Byzantine astronomical texts has been effectively filled by the edition of selected texts in the eleven so far published volumes of the significant series *Corpus des Astronomes byzantins* (CAB)<sup>2</sup>. Nonetheless, as the Byzantine astronomical literature is mainly addressed to an academic audience rather than to wider readership, the relevant critical editions have no commercial value. Consequently, critical editions of Byzantine astronomical treatises after 2001 have been significantly reduced<sup>3</sup>.

---

1. See R. BROWNING, Projects in Byzantine Philology, *JÖB* 31 (1981), 59-74, at p. 63.

2. For a comprehensive presentation of the CAB series, cf. A. TIHON, *Corpus des Astronomes byzantins*, in: *Bientôt un siècle de soutien à des réalisations intellectuelles majeures*, eds. J. K. KOZŁOWSKI - F. DE CALLATAÏ, Cracovie - Bruxelles: Union Académique Internationale 2013, 113-116.

3. Ten volumes of the CAB series appeared between 1983 and 2001, while CAB v. 11

In 2003, the scholarly community of Byzantine studies welcomed the publication of Theodore Metochites' *Stoicheiosis Astronomike* (1.1-5), edited by B. Bydén<sup>4</sup>. This edition offered the Greek text of the very first chapters of a bulky astronomical treatise composed by one of the most important late Byzantine scholars, along with a detailed picture of the historical and philosophical scene of the late 13th and early 14th centuries (the so-called Palaiologan Renaissance), and a profound philological and philosophical analysis of various Byzantine philosophical and scientific texts of the period. After this monograph, the activity concerning the publication of critical editions of unedited Byzantine astronomical texts decreased, as one may conclude from the very few bibliographic entries in the *BZ* (section 11.A). It is not a coincidence that the editorial enterprise of Byzantine astronomical texts continues after 14 years with the publication of the volume under review, which offers a critical edition of a large part from the same text: Theodore Metochites' *Stoicheiosis Astronomike* 1.5-30.

*Στοιχείωσις ἐπὶ τῇ ἀστρονομικῇ ἐπιστήμῃ* ("Elements of Astronomy in Abridgment", hereafter *Stoich.*) is a comprehensive and exhaustive introduction to mathematical astronomy written by Theodore Metochites (1270-1332), the outstanding Byzantine court official, philosopher, and scholar of the Palaiologan era. Since Metochites was one of the most important and prolific writers of his time with a voluminous and multifarious body of work that ranged from scientific to theological topics, astronomy was another field of systematic study for him. With *Stoich.*, Metochites verified his scientific identity among the prominent proponents of Ptolemaic astronomy through his endeavor to describe in a detailed, though pedagogical way, elements of Ptolemy's astronomical knowledge, which would help the comprehension of the motion of the celestial spheres, the rotation of the planets, the trajectory of the sun, the implication of sun's rotations to the length of the year, etc. The intellectual character of his work consists of both theoretical – epistemological, and technical – astronomical content. The former is found mainly in the introductory chapters of the first book (1.1-5), which have been edited and analyzed in detail by B.

---

was published just in 2016: J. LEMPIRE, *Le commentaire astronomique aux "Tables Faciles" de Ptolémée attribué à Stéphane d'Alexandrie: Tome I. Histoire du texte, édition critique, traduction et commentaire (chapitres 1-16)*, CAB 11, Publications de l'Institut Orientaliste de Louvain 68, Leuven: Peeters 2016.

4. B. BYDÉN, *Theodore Metochites' Stoicheiosis astronomike and the study of natural philosophy and mathematics in early Palaiologan Byzantium* [Studia Graeca et Latina Gothoburgensia, 66], Göteborg: Acta Universitatis Gothoburgensis 2003.

Bydén<sup>5</sup>. The latter, which occupies numerous chapters in book 1 (1.6-91) and a dozen of chapters in book 2 (2.1-12) of the work, supplemented by analytical numerical data in tabulated form, is the focus of the volume under review.

With this volume, a noteworthy part of ancient astronomical knowledge, as it was drawn from earlier authors and it was elaborated by Metochites in *Stoich.* (1.5-30), is made available for the first time through the critical edition of Metochites' text with a parallel English translation, and an analysis of its astronomical content. Emmanuel Paschos and Chrestos Simelidis (henceforth P. & S.) –a natural scientist and a philologist respectively– successfully joined their expertise and efforts to implement the study of a demanding astronomical text, such as Theodore Metochites' *Stoich.* Though a little ambiguous about its anticipated content, the title of the monograph "Introduction to Astronomy by Theodore Metochites", printed both in the hard cover, and the half title (p. i) of the volume, becomes clear in the title page (p. iii), where the subtitle "Stoicheiosis Astronomike 1.5-30", added in parenthesis, clarifies that the volume at hand is an edition of a total of 26 chapters from book 1 of Metochites' astronomical treatise<sup>6</sup>. The monograph is divided into three main parts: (i) an Introductory Part (pp. 1-34), (ii) the main body of the Critical Edition including Sigla and Abbreviations (pp. 35-37), as well as the edited Greek text with two apparatuses and the English Translation of *Stoich.* 1.5-30 (pp. 39-341), and (iii) an Analysis of the astronomical content of the edited chapters (pp. 343-80). Bibliography (pp. 381-86), a General Index (pp. 387-90), and four unpaginated color images (between pp. 342-43) supplement the volume. As stated in the Preface (p. v), P. is responsible for the introduction, the English translation, and the analysis of the text, while S. prepared the textual introduction and the critical edition of the Greek text.

---

5. Critical edition of Theodore Metochites' *Stoicheiosis astronomike* 1.1-5 in BYDÉN, *Theodore Metochites' Stoicheiosis Astronomike*, 417-74, {TLG 3191.014}.

6. The general title of the volume: "Introduction to Astronomy by Theodore Metochites" is admittedly helpful in conveying the overall content of the edited text, but it is somehow deficient, because, on the one hand, it disconnects the text from the (already published by Bydén) chapters of *Stoich.* book 1, and, on the other hand, necessitates the use of the additional title "Stoicheiosis Astronomike ('Elements of Astronomy')" in the back-cover of the volume. Nonetheless, the actual title used by the editors in the introductory part of the book is "Stoicheiosis", while at the first page of the edited text (pp. 40-41), P. translates the Greek title *Ἀστρονομικῆς κατ' ἐπιτομὴν Στοιχειώσεως βιβλίον πρῶτον* as "Brief Introduction to Astronomy First Book".

The Introductory Section (pp. 1-34), is clearly structured. It offers concise – though comprehensive– historical-astronomical, philological and prosopographical information related to Theodore Metochites’ scholarly profile, an overview of the entire *Stoich.* content, and a textual introduction that deals with the textual history of the work and the editorial principles followed by the editors for the establishment of the Greek text.

In chapter “1. Introduction” (pp. 1-7), P. offers the reader an overview of all necessary information concerning Theodore Metochites’ scientific background, with special focus on Byzantine astronomy of the Palaiologan period, and the two different “schools” of astronomical tradition that flourished during that period: the group of Byzantine astronomers that followed the ancient astronomical tradition including Ptolemaic astronomy, and the group of astronomers that brought to Byzantium elements from Persian and Arabic astronomy. While Metochites belonged to the proponents of the ancient astronomical tradition, P. briefly presents Metochites’ theoretical views on ancient astronomy as expressed in *Stoich.* 1.1 (edited by B. Bydén), and concludes that no evidence for an influence from Persian astronomy is observable in Metochites’ text, at least for the chapters included in the present edition (p. 2). Furthermore, P. discusses the educational character of the text along with some observations on Metochites’ writing style (p. 3), and supports the need for a translation and analysis of its descriptive and mathematical content, so that the modern reader both benefits from the full meaning of Metochites’ astronomical knowledge, and discovers connections with the past, as well as possible influences it exerted in the future (p. 4). At this point, P. aptly justifies the choice to begin the present edition from *Stoich.* 1.5 (a chapter already edited by B. Bydén) by observing that ch. 1.5 in fact outlines the astronomical character of the entire treatise, while ch. 1.1-4 have a preliminary, philosophical character. Nonetheless, a summary of chapters’ 1.1-4 content would be welcome by the reader who wishes to gain an overall impression of the theoretical – philosophical background that Metochites prefixed to the main astronomical body of his work, without the need of Bydén’s study. In the remaining paragraphs of this chapter, P. explores astronomical topics related to the edited text: 1. Metochites’ proposal for revising the calendar (ch. 25 & 26 of the text) attracted the attention of John Chortasmenos (ca. 1370–ca. 1436/7), who annotated passages of Metochites’ text in several mss., and inspired Nikephoros Gregoras’ (1295–1358) correction of the length of the tropical year, as it was estimated by Ptolemy (pp. 4-5). 2. Changes that Metochites applied through *Stoich.* to the revival of astronomy along the lines of classical Greek tradition through his

proposal for selecting a new date for measuring time, and the catalogues for the position in longitude of the fixed stars of first and second magnitude (pp. 5-6). 3. Instructions that Metochites gave on how to calculate the position of the Sun and the stars without including numerical calculations (p. 6). 4. Further topics covered in Metochites' text (p. 7).

Chapter "2. Table of Contents of *Stoicheiosis Astronomike*" (pp. 9-21) offers the reader a valuable list of the Greek chapters' headings of *Stoich.* with an English translation. The 91 chapters' headings of book 1 (in p. 9, number 81 as translation of the Greek number *Ϟα* should be corrected to 91) have been compiled from ms. Vaticanus gr. 182 (V); the 12 chapters of book 2 follow Vaticanus gr. 1365 (C) (p. 9, n. 18)<sup>7</sup>. Apart from its apparent value as a modern *pinax* of *Stoich.* content, and the presentation of the headings for the chapters of books 1 (ch. 31-91) and 2 (ch. 1-12), which were not included in the present edition, for the benefit of the reader who wishes to have an overview of the content of this enormous treatise, this important list also shows the division of the work into books and the extent of the text that P. & S. accept as Theodore Metochites' *Stoich.* At the end of this chapter (p. 21), P. & S. conclude: "In several manuscripts, including the most important ones (V and C), *Stoich.* is followed by Metochites' *Ἐπιτετημημένον ἐγκώμιον τῆς τοῦ Πτολεμαίου Μαθηματικῆς Συντάξεως* ('Epitomized praise of Ptolemy's Mathematical Syntax'). This was written as a separate work or was intended as an appendix to the *Stoicheiosis*". This observation reflects the editors' silent adoption of C. Sathas' view that the text entitled: *Epitomized praise of Ptolemy's Mathematical Syntax* (referenced to by Sathas as *Ἐπομνηματισμοὶ εἰς τὰ ΙΓ' βιβλία τῆς τοῦ Πτολεμαίου Μαθηματικῆς Συντάξεως*) is a separate work written by Theodore Metochites and "annexed" to the two books of *Stoich.*<sup>8</sup>. However, the division and articulation of *Stoich.* is an important, but unfortunately still unsettled topic, which P. & S. should have discussed in more detail<sup>9</sup>. Given that I. Ševčenko has convincingly supported

7. In ms. C (f. 243v) there is a subtitle for *Stoicheiosis Astronomike* book 2: *Προπαρασκευὴ εἰς τὴν κατάληψιν τῆς τοῦ Πτολεμαίου Συντάξεως*; cf. I. ŠEVČENKO, *Études sur la polémique entre Théodore Métochite et Nicéphore Choumnos*, Brussels 1962, 284. This subtitle is missing from the list of chapters' headings of book 2 (p. 20).

8. The title of this text comes from Marcianus gr. 330 (M), f. 209, and is perceived by Sathas as a separate work from *Stoicheiosis Astronomike*; C. SATHAS, *Μεσαιωνικὴ Βιβλιοθήκη*, v. 1, Venice 1872, Ϟιθ'.

9. For instance, *Stoich.* is referenced to as a "three-part treatise on Ptolemy" in: P. AGAPITOS - K. HULT - O. SMITH, *Theodoros Metochites on philosophic irony and Greek history*:

the view that the two books of *Stoich.* are supplemented by one more text (i.e. the 15 chapters of the *Epitomized praise of Ptolemy's Mathematical Syntax*), which must be perceived as part of *Stoich.*<sup>10</sup>, a brief discussion on Ševčenko's and Sathas' arguments along with a presentation of the relevant chapters' headings of the *Epitomized praise of Ptolemy's Mathematical Syntax* would offer the reader valuable supplementary information for a deeper comprehension of the division and structure of Metochites' entire astronomical treatise.

Chapter "3. Textual Introduction" (pp. 23-34) consists of three sub-chapters. Chapter "3.1. The manuscripts" (pp. 23-29) encompasses important information elucidating the manuscript tradition of *Stoich.* The editors adopt the 11 mss. Inventory and the *stemma codicum* constructed by B. Bydén in his edition of *Stoich.* (1.1-5). Codicological data presented in the 11 mss. inventory (p. 23) are limited to what is absolutely necessary. Therefore, for each ms. that preserves *Stoich.*, S. quotes the *folia* for both books of the treatise without distinction. However, a more detailed presentation of codicological information for each manuscript would be enlightening for the reader for two reasons: first, because the reader would gain a clear picture of the extent and articulation of *Stoich.* in every manuscript; second, because these details would clarify the editors' view concerning the exclusion of the *Epitomized praise of Ptolemy's Mathematical Syntax* from the division of *Stoich.*<sup>11</sup>. This last point is essential, because S. would have avoided the inclusion of the *Epitomized praise* as part of *Stoich.* in the case of ms. Z<sup>12</sup>. Regarding

---

*Miscellanea 8 and 93*, Nicosia-Göteborg 1996, 10 (also cited in p. 24, n. 22). On the other hand, B. Bydén accepts Ševčenko's view that *Stoich.* "must –at the time of its publication– have been conceived as one work", and seems to recognize the *Epitomized praise of Ptolemy's Mathematical Syntax* as the second part of *Stoich.* book 2; cf. BYDÉN, *Theodore Metochites' Stoicheiosis Astronomike*, 35 and 233 respectively.

10. Cf. ŠEVČENKO, *Études sur la polémique*, 284-86.

11. For the division of *Stoich.*, cf. the previous paragraph.

12. While presenting the inventory of mss. that transmit the *Stoich.*, S. writes (p. 23): "Z Vaticanus gr. 2176, ff. 53-293". According to the catalogue of S. Lilla, *Stoich.* occupies indeed ff. 53-293. However, a closer look at the numbers of *folia* containing the separate books of the work in the catalogue would offer the following additional and elucidating information: *Stoich.* book 1 is contained between ff. 55-209v, with a table of contents prefixed in ff. 53-54v; book 2 extends to ff. 211-229v; "book 3" (as stated by Lilla) lies between ff. 231-293, prefixed in f. 231 with the title: Ἐπιτετυμμένον ἐγκώμιον τῆς τοῦ Πτολεμαίου Μαθηματικῆς Συντάξεως; cf. S. LILLA, *Codices vaticani graeci. Codices 2162-2254: codices Columnnenses*, Vatican City 1985, 45. Thus, in the case of ms. Z, the editors



the *constitutio textus*, S. considers conclusions already drawn by Ševčenko and Bydén for the adoption of mss. V and C as primary textual witnesses for the establishment of the Greek text and the elimination of other secondary mss.<sup>13</sup> To the collation of these primary mss., S. added the collation of Vaticanus gr. 1087 (G), since this ms. was the scribal product of Nikephoros Gregoras, Theodore Metochites' student who became an accomplished astronomer himself, and added some annotations and marginal notes on G. For these three primary mss., S. offers full codicological descriptions (pp. 26-28), and presents useful information concerning the supplementary diagrammatic material that these mss. contain (pp. 28-29). Chapter "3.2. The apparatuses" (pp. 29-30) concisely describes the editorial policy regarding the compilation of the two apparatuses of the edition: the critical one, and the *apparatus fontium*. Chapter "3.3. Punctuation, accentuation and word divisions" (pp. 30-34) conveys an interesting discussion on the punctuation of the text appearing in the primary mss. Based on recent scholarly discourse concerning Byzantine attitudes of punctuation in the Byzantine mss., S. offers a couple of passages from *Stoich.* along with their varied versions found in mss. V and C as illuminating examples for the discrepancies on punctuation between the mss. and the conventions adopted for the edition of the present text. Further examples are also offered as far as accentuation is concerned, the use of numerals in the text, and the cases of word connection or division.

The second, and principal, part of the monograph is the critical edition of 26 chapters from Theodore Metochites', *Stoich.* book 1. Scribal abbreviations and works of ancient authors cited in the two apparatuses are presented in Chapter "4. Sigla and Abbreviations" (pp. 35-37). Chapter "5. Stoicheiosis Astronomike 1.5-30: Text & Translation" (pp. 39-341) offers the original Greek text entailed by the *apparatus criticus* and *fontium*, the English translation in facing pages, and 24 arithmetic tables that supplement chapter 28 of the main text in an Appendix (pp. 317-341). The Greek text is drawn from mss. V and C. However, there are neither indications of *folia* numbers of, at least, the principal ms. V in the margins of the edited text (as it is the current practice in modern critical editions), nor *folia* numbers for the edited part of the text for each ms. in the *sigla codicum* in the Sigla (chapter 4, p. 35), even

---

mistakenly considered the *Epitomized praise of Ptolemy's Mathematical Syntax* as part of the text of *Stoich.*

13. Two references to "Ševčenko (1982)" in p. 29 n. 33 and n. 34 should be read as Ševčenko (1975) according to the Bibliography of the volume.



though there are references to *folia* of ms. V and C in the Analysis section (pp. 361-62) that remain without correspondence to the Greek text<sup>14</sup>. The lining of the Greek text is continuous for each chapter, as was the practice also in Bydén's edition (*Stoich.* 1.1-5), but the paragraphs of each chapter are without numbering. From an editorial point of view, the text flows smoothly and almost flawlessly<sup>15</sup>. Sometimes the flow of the text is interrupted by dashes, which include textual entities of parenthetical character. For the use of dashes in the text, a brief explanation in the textual introduction would be helpful for the reader. Concerning the structure and content of the Greek text, it should be pointed out that its character is mostly technical, with emphasis on the transmission of the ancient astronomical knowledge organized in well-defined thematic entities. Concerning Metochites' prose, one should observe that the text is featured by the author's idiosyncratic style, which is characterized by repetitions through progressive rephrasing of already stated sentences, the use of catchwords and cyclic construction as a stylistic device<sup>16</sup>. Therefore, repetition is a common feature in the edited text implemented by frequent self-references to thoughts stated earlier. Given that the volume under review principally deals with the astronomical content of Metochites' text, the thick grid of author's self-references –a useful feature for the study of Metochites' method of argumentation and prose writing– remained out of focus<sup>17</sup>.

14. For instance: (p. 348) reference to C f. 236v; (p. 349) references to C f. 75v, V f. 77v, C f. 233v; (p. 361) references to C f. 49v and f. 50v; (p. 377) reference to V f. 77r.

15. Some points that need further editorial attention, e.g.: *δεικνύναι* (7.66 appears inconsistent to *δεικνύειν*: 5.12; 5.146), *ἐλλάτων* instead of *ἐλάτων* (18.63), *ανξ* instead of *ανξ* (19.65), *ἐν* instead of *ἐν* (20.107), *αζ* (20.197) instead of *αζ, ἔτη* instead of *ἔτη* (p.198, first-left column), *ὀρίζοντος* instead of *ὀρίζοντος* (if *ὀ-* in the marginal comments in ms. G, then a *sic* would be necessary) (27.151-55 app. crit.), have no serious impact on the integrity of the text. The type *ἀλλάττα* (16.10), which amends *ἄλλάττα* of the mss. V and C, does not facilitate comprehension, because *ἄλλάττα* [= ἄλλα+ἄτινα/ἄττα] is the actual word employed also by Metochites elsewhere; cf. Theodore Metochites, *Orationes in imperatorem Andronicum II* (e cod. Vindobonensi phil. gr. 95 ff. 81-96v et 145v-158) 2.14.48, {TLG 3191.016}, ed. I. POLEMIS, *Οἱ Δύο Βασιλικοὶ Λόγοι*. [Κείμενα Βυζαντινῆς Λογοτεχνίας 4], Athens 2007.

16. For Metochites' stylistic features, cf. BYDÉN, *Theodore Metochites' Stoicheiosis Astronomike*, 412.

17. A few examples of repetitive self-references in the text: (5. 61) *ὥς ἔφημεν* refers to: 5.50-53; (5.72) *ὥς ἔφημεν*. 5.62-63; (5.137-8) *ὥς ἔφημεν*. 5.120-21; (6.26) *ὥς ἔφημεν*. 6.20-24; (6.47) *ὥς ἔφημεν*. 6.14-17; (5.89) *ὥς ἔφημεν*. 6.63-64; cf. (7.4) *ὥς ἔφημεν*. 6.96-98; (7.18-19) *ὥς ἔφημεν*. 7.9-10.

The *apparatus criticus* of the Greek text is negative; it records the variant readings between mss. V and C. Occasionally, it includes marginal comments written by John Chortasmenos, who owned ms. C, and scanty corrections written by Nikephoros Gregoras in ms. G. The *apparatus fontium* is light and includes all explicit quotations and references made by Metochites to Ptolemy, Theon, Euclid and other ancient mathematicians<sup>18</sup>. Even though one must acknowledge the difficulty in distinguishing between conscious imitation, coincidences and mere philosophical commonplaces in Metochites' text, further exploration of the sources of scientific argumentation for the author in the *apparatus fontium*, would benefit the reader a lot, since it would offer a base for further research on Metochites' philosophical and scientific background<sup>19</sup>.

The English translation runs in parallel with the Greek text, and has the great advantage of autonomy. Having to cope with Metochites' idiosyncratic style of prose, P. succeeded in making the translation easier for the modern reader to read by limiting repetitions and keeping the content of sentences and paragraphs. Therefore, the translation can be read independently from the Greek text by the reader who is interested in accessing directly the content of the work. For this purpose, the reader can find a valuable aid in the final part of the monograph, which offers an analysis of the astronomical – mathematical content of the text.

---

18. Some amendments concerning references in the *apparatus fontium* may offer minor aid to the identification of Metochites' sources: (76.58-59 "Υλη γὰρ τῆς ἀστρονομικῆς ἐπιστήμης, ὡς ὁ παλαιὸς λόγος, 'τὰ φαινόμενα' καὶ τῶν ὁρωμένων αἱ ὑποθέσεις): the passage is referenced to "Sext. Adv. Math. 7.140 ὅψις γὰρ τῶν ἀδήλων τὰ φαινόμενα, ὧς φησιν Ἀναξαγόρας" in the *apparatus fontium*, but, in my opinion, it has a contrary meaning compared to what Metochites suggests, because Metochites says that "the subject matter of astronomy is the phenomena and the formulation of hypotheses for observations" (cf. translation p. 77), while Anaxagoras, after Sextus Empiricus, postulates that "appearances (the phenomena) are a vision of invisible"; (76.82-83 'καθόλου τῶν μὲν αἰσθήσεων ἰδίον ἐστὶ, τὸ τοῦ μὲν σύγγενος εὐρετικόν') should be referenced to Ptol. *Harm.* 1.1.7; (78, 84-85 'τοῦ δι' ἀκριβοῦς παραδεκτικόν') should be referenced to Ptol. *Harm.* 1.1.8; (79.87-88) the reference to "Ptol. *Harm.* 1.1.6-8" should be read as Ptol. *Harm.* 1.1.8-9.

19. Just to mention an example: (6.1-4) Διτταὶ τοίνυν περιφοραὶ περὶ τὸ οὐράνιον θεωροῦνται σώμα ἐναντίως πρὸς ἀλλήλας ἔχουσαι, ἡ μὲν ἀπ' ἀνατολῶν ὡς πρὸς δυσμᾶς ... ἡ δὲ ἀπὸ δυσμῶν εἰς ἀνατολὰς probably reflects Procl. In Pl. Tim. 3.77.14-16 (ed. DIEHL), {TLG 4036.010}: Διττῆς, ὡς πολλάκις ὑπέμνησται, τῆς περιφορᾶς οὕσης, τῆς μὲν ἀπ' ἀνατολῆς ἐπὶ δύσιν, τῆς δὲ ἀπὸ δύσεως ἐπ' ἀνατολήν.

Chapter “6. Analysis” (pp. 343-80) is focused on the historical astronomical – mathematical content of the text. With remarkable precision and clarity P. sets out all necessary information concerning the thematic areas covered within the edited text. In 11 sub-chapters –not listed in the table of content of the volume– P. helps the reader determine the range of astronomical topics discussed in the chapters of the edited text, and offers in parallel an in-depth analysis of the astronomical information included in the text: 1. Introduction (ch. 5); 2. The Nine Celestial Spheres (ch. 6-9); 3. A Brief Survey of Geography (ch. 10-12); 4. Eccentric Circles and their Properties (ch. 13-18); 5. The Uniform Motion of the Sun (ch. 19-22); 6. The anomalous motion of the Sun (ch. 22-23); 7. A New Calendar (ch. 25); 8. Determining the Position of the Sun at the Beginning of the New Calendar–by including Uniform and Anomalous Rotations (ch. 26); 9. Description of Ascensions and their Tables (ch. 27-28); 10. Calculation of the Horoscope and of Upper Culmination (ch. 30); 11. The Obliquity (ch. 29). In each sub-chapter, P. discusses the astronomical content of Metochites’ text within the framework of the history of Byzantine astronomy, thus producing another autonomous section in the monograph, which is addressed to the specialists in Byzantine astronomy.

The volume is completed with the Bibliography (pp. 381-86) of modern works quoted in the introductory and analysis part, and a General Index (pp. 387-90). The Index lists a short collection of astronomical and mathematical terms, persons, and geographical names occurring in the three main parts of the monograph. However, another index for notable Greek words –as it is the practice in modern critical editions of Byzantine texts– would have been welcome by those interested in Metochites’ use of diction.

Scholarly interest in the authorial activity of Theodore Metochites has been increased in the last years, as one may conclude from the publication of modern critical editions and translations of his multifarious work. Therefore, every new edition of Metochites’ writings is a welcome addition to the existing body of texts produced by that significant Byzantine author and an important textual contribution to the treatments of Metochites’ literary style and thought. With their volume P. & S. have significantly contributed to the advance of scholarship on Theodore Metochites, and to the study of Byzantine astronomical literature of the Palaiologan period. The cautions signaled here should not obscure the value of P.’s & S.’s monograph, which definitely offers a fundamental tool for the study of the Byzantine scholar’s scientific work, and hopefully will encourage further work on the rest of Metochites’ unpublished astronomical texts. Due to the excellent

job that P. & S. have accomplished, the Introduction to Astronomy by Theodore Metochites will undoubtedly become an indispensable source of material and inspiration not only for students of the Palaiologan Renaissance and the rest of Byzantine literature and civilization, but also for those concerned with the reception of the ancient astronomy, of which Metochites was a conscious and critical reader.

IOANNIS TEELIS

Research Center for Greek and Latin Literature  
Academy of Athens

