

SCANDINAVIAN JOURNAL OF BYZANTINE AND MODERN GREEK STUDIES

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Monographic section

Greek Astronomical Manuscripts: New Perspectives from Swedish Collections

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Introduction

Barbara Crostini

The International Workshop, *Greek Astronomical Manuscripts: New Perspectives from Swedish Collections*, was held at Uppsala University, 24-25 August 2017. The Workshop was sponsored by the Faculty of Philology and Linguistics at Uppsala University with a generous award.¹ The purpose of the meeting was twofold: to gather experts in this specialized field, and to reflect about methods of manuscript cataloguing, with specific reference to Greek astronomical manuscripts.

Interest in astronomy has grown among Byzantinists. In Sweden, the work by Börje Bydén, the leading voice in this field, is marked by his edition and study of Theodore Metochites' *Stoicheiosis Astronomike*.² In

¹ My thanks to the Faculty for supporting this event.

² Börje Bydén, *Theodore Metochites' Stoicheiosis Astronomike and the Study of Natural Philosophy and Mathematics in Early Palaiologan Byzantium*, *Studia Graeca et Latina*

Belgium, research has progressed almost single-handedly through the activity and, one senses, the enthusiasm of Anne Tihon³ of the Catholic University of Louvain-la-Neuve, now followed by her students, such as Régine Leurquin⁴ and Anne-Laurence Caudano.⁵ Tihon conveys such excitement in a recent summary of the current knowledge of Byzantine astronomy. Evidently, such interest is derived from the fact that many texts still need to be studied from the original manuscripts, and that, by the thirteenth and fourteenth century, when ‘interest in astronomy was growing in the Byzantine world as everywhere in the European countries’, such manuscripts tell the story not only of textual transmission, but also often of their scribes as authors and owners.⁶ Yet, on all accounts, many puzzles remain, generated not least by the volume of information still needing to be scrutinized by careful study and made available in new editions.

Tihon’s article sets out very clearly the boundaries between astronomy and astrology, not necessarily along modern scientific discriminations that imply a hierarchical ranking with a value judgement attached, but according to a distinction between ‘theoretical’ and ‘practical’, where, in the first category, some of the modern scientific methodology can be found in reasoning about the universe. Thus, the sections in her article are divided according to types of astronomical theories. The first category is cosmology, a branch that is so speculative as to be associated, in fact, with both philosophical and theological speculation. As Benjamin Anderson shows in his comprehensive and beautifully illustrated book, cosmological diagrams enter the illustration of biblical

Gothoburgensia, 66 (Göteborg: Acta Universitatis Gothoburgensis, 2003).

³ Anne Tihon, *Etudes d’astronomie Byzantine*, Variorum Reprints. Collected Studies Series (Aldershot, Variorum, 1994).

⁴ Theodoros Meliteniota, *Tribiblos Astronomique*, ed. Régine Leurquin, Corpus des Astronomes Byzantins, (Amsterdam: Gieben, 1990).

⁵ Anne Caudano, “*Let There Be Lights in the Firmament of the Heaven*”: *Cosmological Depictions in Early Rus*, Suppl. 2 vols, Palaeoslavica 14 (Cambridge Mass.: Palaeoslavica, 2006).

⁶ Anne Tihon, ‘Astronomy’, in *The Cambridge Intellectual History of Byzantium*, ed. Anthony Kaldellis and Niketas Siniosoglou (Cambridge University Press, 2017, pp. 183-197).

texts, such as the Psalter.⁷ Cosmas Indicopleustes's complex work, the sixth-century *Christian Topography*, is of course largely based on the Bible.⁸ The contribution by Anne-Laurence Caudano to our conference highlighted some of these cosmological theories of the universe in her opening lecture.

The sphere of astronomy that was closest to the interests of this conference was that of mathematical astronomy, which, in Tihon's words, 'allowed one to perform calculations concerning the most important astronomical phenomena (such as the position of the Sun, Moon, and planets; syzygies; and lunar and solar eclipses); also treatises concerning the plane astrolabe and sometimes other astronomical instruments; and finally the computation of Easter'.⁹ The resulting tables are, to the non-expert, impenetrable. One needs to acquire a specific knowledge of symbols, numbers and their tabular use to even start making any sense of such rows of otherwise puzzling numbers (fig. 1). I was grateful to receive the experts' help on this aspect of cataloguing *MS Linköping kl. f. 10*.¹⁰

⁷ Benjamin Anderson, *Cosmos and Community in Early Medieval Art* (New Haven: Yale University Press, 2017), figs 71-72, pp. 132-135.

⁸ Wanda Wolska-Conus, *Topographie Chrétienne*, Sources Chrésiennes (Paris, 1968); Wanda Wolska, *La Topographie Chrétienne de Cosmas Indicopleustes : Théologie et Science au VIe Siècle*, Bibliothèque Byzantine. Etudes, (Paris, 1962); for the illustrated manuscripts, see Jeffrey C. Anderson, *The Christian Topography of Kosmas Indikopleustes: Firenze, Biblioteca Medicea Laurenziana, Plut. 9.28 : The Map of the Universe Redrawn in the Sixth Century, with a Contribution on the Slavic Recensions* (Roma: Edizioni di storia e letteratura, 2013); Maja Kominko, *The World of Kosmas : Illustrated Byzantine Codices of the Christian Topography* (New York: Cambridge University Press, 2013); see also Birgitta Elweskiöld, *John Philoponus against Cosmas Indicopleustes: A Christian Controversy on the Structure of the World in Sixth-Century Alexandria* (Lund: Dept. of Classics and Semitics, 2005); Horst Schneider, *Christliche Topographie* (Turnhout: Brepols, 2010); translation by J. W. McCrindle, *The Christian Topography of Cosmas, an Egyptian Monk: Translated from the Greek, and Edited with Notes and Introduction* (Cambridge: Cambridge University Press, 2010), <http://dx.doi.org/10.1017/CBO9780511708473>.

⁹ Tihon, 'Astronomy', 184.

¹⁰ I am especially indebted to Anne-Laurence Caudano and Alberto Bardi for progress in this matter. Their contribution has been invaluable in achieving a better description of the contents, as appears printed below.



Fig. 1: Detail from *Linc. kl. f. 10*, astronomical tables.

Our workshop consisted of four invited speakers besides Patrik Granholm and myself. Three of these, namely, Filippo Ronconi, Anne Weddigen and Alberto Bardi, accepted to publish their papers in this issue of *SJBMG*. Our main speaker, Anne-Laurence Caudano, from the University of Winnipeg, gave two talks: the opening lecture, entitled ‘Spheres, Eggs and Vaults: Cosmography in Late Byzantine Manuscripts’, and a final paper entitled ‘Byzantium at the Crossroads of Late Medieval Astronomy’. She has kindly provided a summary of her lecture printed below.

Patrik Granholm presented the criteria and achievements of the project of digitizing the Greek manuscripts in Sweden. Some of the material gathered in that project is now available online at the address www.manuscripta.se. An article summarizing the highlights of the project has recently been published, containing further information on this catalogue.¹¹ My contribution to the workshop, besides the organizational aspect, consisted in presenting some of the manuscript material in a session at the Carolina Library, where pride of place was given to codex Linköping kl(assiska) f(örfattare) [i.e. Classical authors] 10. In

¹¹ Barbara Crostini, ‘Greek Manuscripts in Sweden: a Digital Catalogue (www.manuscripta.se)’, in *Greek Manuscript Cataloguing: Past, Present, and Future*, ed. by Paola Degni, Paolo Eleuteri and Marilena Maniaci (Turnhout: Brepols, 2018), pp. 59-66.

fact, puzzling over several aspects of this manuscript was what gave rise to the idea of gathering some scholars around it, benefiting both from its proximity¹² and from each other as resources to progress in its description.

Accounting for the contents of *Linköping kl. f.* 10 was difficult both because of their astronomical nature and due to the disordered state of its leaves in the current binding arrangement. The paper by Alberto Bardi published below, together with some of his recent publications, bring some important new information to bear upon the history of this codex, including its stemmatic placing in the tradition of some of its texts, and an ownership note that locates the codex in Northern Italy. These aspects are determinant in evaluating, as it happens, negatively, my hypothesis that this manuscript could have belonged to a group that survived the Escorial fire of 1671 and that subsequently migrated into Swedish collections. The 1994 article by Sofia Torallas Tovar describes the state of research on this group, forming a kind of important sub-collection among the holdings of Greek manuscripts in Sweden.¹³

For *Linköping kl. f.* 10, it is not exactly known how the manuscript reached Sweden. It was bought by Enricus Benzelius the Younger (1675-1743) in Stockholm, together with *Ups. gr.* 30, a thirteenth-century parchment manuscript of the *De natura hominis* by Meletios. Its battered state, with some dark patches that could have been caused by exposure to heat, as well as the disarray of its leaves, tell a story that was not entirely smooth. The possibility that it could be identified with the astronomical miscellany, *Scorial.* H.V.3, which De Andrès records as a copy of Burney 91,¹⁴ was therefore open. However, the conclusion was

¹² During the cataloguing campaign, the manuscripts from Linköping were kept at the Carolina Library.

¹³ Sofia Torallas Tovar, 'De Codicibus graecis Upsaliensibus olim Escorialensibus', *Erytheia. Revista de Estudios Bizantinos y Neogriegos* 15 (1994) 191-258. The identification of *Ups. gr.* 6 and 8 is due to: L. O. Sjöberg, 'Codices Upsalienses 6 et 8', *Eranos* 58 (1960), 29-35.

¹⁴ G. De Andrès, *Catalogo de los códices griegos desaparecidos de la Real Bibliotheca de El Escorial* (Madrid, 1968), pp. 179-80, cited by R. Leurquin, *Théodore Méliéniote, Tribiblos astronomique, Livre I* (Amsterdam, 1990), pp. 77-78. The ms was a 15-16th cent. paper codex, of 291 ff. It is in fact more likely that it was Burney itself:

reached that the Lincopensis did not go through the major catastrophe of that large-scale fire.

The description of this manuscript and the reconstruction of its history have therefore greatly benefited from the input of all scholars who participated in the workshop. Moreover, the occasion facilitated not only the immediate exchange of information, but also enabled the scholars participating to get to know each other, so as to open up the possibility of future collaboration. Although the Escorial hypothesis for the Linköping astronomical collection turned out to be disproven, the process of understanding more about the nature of scientific miscellanies and the transmission of astronomical texts has been valuable. Caudano discussed the nature of this compilation in the context of ‘the currents of late Byzantine astronomy that studied foreign material of Persian, Jewish or Latin origins, because Byzantine astronomers acknowledged that the Greek tables inherited from Ptolemy were outdated and did not yield precise results’.¹⁵ This view is shared and further detailed by Bardi in the paper published below. Caudano also discussed its contents by comparison with the astronomical work of John Chortasmenos (1370-1437), a teacher and a notary at the Patriarchal Chancery who was deeply interested in astronomical methods and a keen practitioner of astronomical exercises. She singled out his astronomical autograph, *Vat. gr.* 1059, as offering a range of texts and exercises that characterized the work of many Byzantine astronomers, who produced better tables and methods to counteract the inaccuracy of the Ptolemaic system. As Bardi explains, the Ptolemaic model and its attached tables simply no longer worked. Caudano stressed that it is in a pre-Copernican international context of exchanges of astronomical texts that aimed at patching or creating alternatives to Ptolemy that we must also think of such a manuscript as the Linköping miscellany. Despite the water or fire damage and the disarray of its leaves, the Linköping codex is a good-quality presentation copy,

Alberto Bardi notes that the Escorial signature is written at fols. 3r and 4r in this manuscript in his forthcoming monograph, *Persische Astronomie in Byzanz. Ein Beitrag zur Byzantinistik und zur Wissenschaftsgeschichte*.

¹⁵ A summary of her paper was provided by the author, from which this quotation was taken.

with some aspiration at formal presentation of its contents, as the ornamental initial (now faded) at fol. 7v shows (fig. 2).

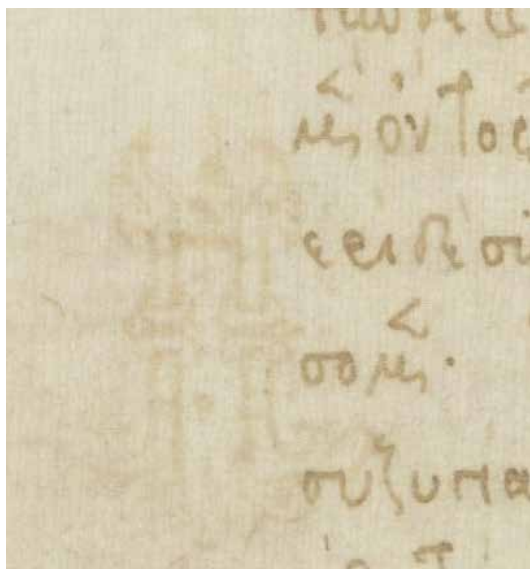


Fig. 2:
Enlarged initial, mostly faded. Linc. kl. f. 10, f. 7v

This monographic section of the journal begins with a discussion of cataloguing methods for miscellaneous manuscripts by Filippo Ronconi. In his essay, ‘Manuscripts as stratified social objects’, Ronconi speaks of the impact of history on a manuscript as “scars ... documenting the critical moments of its biography. In this socio-historical perspective, the scars turn out to be more valuable than the intact parts of the book.” The present battered countenance of the hero of our workshop, the *Lindköping kl. f. 10*, well exemplified such importance, raising the questions at the heart of these proceedings: its missing pages, confused rearrangement, darker patches perhaps from an ancient experience of fire, the fading ink, are all “scars” speaking to us of the manuscript’s “biographical” path, as Ronconi himself calls it.

Ronconi’s methodology sets high standards for cataloguing manuscripts. The Uppsala team has kept well in view the stratigraphic method he advocates when designing the templates for the online catalogue. However, as the following essay by Paris cataloguer and PhD candidate,

Anne Weddigen, shows, the practicalities of applying such criteria are a different matter. Weddigen showcases an example of the difficulty of cataloguing compilations of smaller extracts that make up new texts from previously known, or sometimes even unidentifiable, sources. She raises both issues of presentation of such materials, and, more importantly, questions of limits: if a cataloguer were to stop at the minutiae of every small text, s/he might never finish the task at hand! Dedicating a whole article, with the annexed research, to every page out of at least one hundred similar ones in the codex she considers, *Paris. gr. 2494*,¹⁶ is therefore unrealistic, at least in terms of a catalogue based on general holdings rather than a more specialized, thematic publication. However, the eclectic nature of miscellanies often fails to reflect a coherent thematic approach, and therefore defies modern criteria of categorization. As Eva Nyström's monograph on one such manuscript well exemplifies,¹⁷ genres and categories are often opaque. In Weddigen's example, the neater definitions of astronomy as looking at natural phenomena as against astrology, i.e. considering their consequences on humans, are again more fluid than currently thought.

Bardi's careful explanation of how astronomical handbooks work, and his detailed philological researches concerning such texts, leave one with the distinct feeling that such topics remain for the specialist, because their piecemeal quality, their technical complexity and the still ongoing progress of research do not allow the layman to tread securely over such unexplored and complex territory. Bardi provides suggestions for a dating of the Linköping manuscript through careful study of its tables, ironically calling them reader-friendly. Since the tables start in the Persian year 778 (i.e. 1408/09), we may take that as the *terminus ante quem non* for this manuscript. Bardi also notes scribal similarity with *Paris. gr. 2501* and *Marcianus graecus Z 326*, the latter a codex in the Marciana that belonged to Cardinal Bessarion (1399/1400-1472). In the conclusion, Bardi also points to the reception (*Nachleben*) of this type

¹⁶ This miscellany also contains extracts from the *Life of St Andrew the Fool* edited by Lennart Rydén.

¹⁷ Eva Nyström, *Containing Multitudes : Codex Upsaliensis Graecus 8 in Perspective* (Uppsala: Acta Universitatis Upsaliensis, 2009).

of erudite collection in Renaissance Italy and beyond. Such ‘a collection of texts stemming from different cultural traditions collected in one volume’ displays at once a desire for knowing such recondite subjects in different cultures and for tackling the complexities of astronomy itself with a view to more immediate application.

A Brief Description of *Linköping kl. f. 10*

Watermarked paper, 195 mm × 132 mm, II + 202 + II’ folia. 15th cent., first half.

Contents: ff. 1–27 *Paradosis* (ascribed to Georgios Chrysococces); f. 28 blank; f. 29 astronomical text (excerpt from Stephanus Alexandrinus); ff. 30–32 blank; ff. 33–80v astronomical tables [not by Ptolemy; under review]; ff. 81–107 tables without numbers; ff. 108–110 blank; ff. 111–124r Michael Chrysococces, *Hexapterygon Iudaicum*; ff. 124v–125v blank; ff. 126–148 tables; ff. 149 blank; ff. 150–157r computation tables; f. 157v blank; ff. 158–162v Ptolemy, κανὼν πόλεων ἐπισήμων; ff. 163–165v blank; ff. 166r–170r, 172v–178r Isaac Argyros, *De cyclis solis et lunae ad Andronicum*: Ἰσαὰκ μοναχοῦ τοῦ ἀργυροῦ τῷ Οἰναιώτῃ κυρίῳ Ἀνδρονίκῳ μεθόδους αἰτήσαντι λογικὰς ἐκθέσθαι ἡλιακῶν καὶ σεληνιακῶν κύκλων καὶ τῶν τούτοις ἐπομένων (ff. 170v–172v contain a text about the computation of the beginning of the year); f. 178v Nikephoros Gregoras about the Easter computation; f. 179r table; ff. 179v–180r blank; ff. 180v, 184r–v, 181r–183v, 186 Isaac Argyros, *De radice quadrato*, ed. A. Allard, ‘Le petit traité d’Isaac Argyre sur la racine carrée’, *Centaurus* 22 (1979): 14–29, tit.: **Περὶ εὐρέσεως τῶν τετραγωνικῶν πλευρῶν τῶν μὴ ῥητῶν τετραγώνων ἀριθμῶν**, TLG 4355.004 [identified by A. Caudano], p. 14, l. 1; ff. 185, 189–190v about the use of the astrolabe (cf. *Vat. gr.* 1059, ff. 74v–76r); ff. 187–188 continuation of the computus for Andronikos by Argyros; ff. 190v–191r excerpt from *Περὶ χαταρχῶν* of the Pseudo-Maximus Astrologus; ff. 191v–193v about celestial phenomena; ff. 193v anonymous astrological text; ff. 193v–194v introduction to the *Phainomena* of Aratos; ff.

194v–196v astrological computations; ff. 197r–200v blank.¹⁸

Ownership marks: f. 1r: Lucretii Palladii (Lucrezio Palladio degli Oli-
vi); f. 1v: Ex bibliotheca Er. Benzeli Er. filii.

Acquired by Linköping Stiftsbibliothek in 1757.

¹⁸ A more complete description can be found online, at <https://www.manuscripta.se/ms/100097> [accessed 2018-11-22]. The basis for this short description, here slightly modified, is published by Alberto Bardi, ‘The Paradosis of the *Persian Tables*. A Source on Astronomy between the Ilkhanate and the Eastern Roman Empire’, *Journal for the History of Astronomy* 49.2 (2018): 239–260, at pp. 244–245. See also the references to this codex in idem, ‘Bessarione a lezione di astronomia da Cortasmeno’, *Byzantinische Zeitschrift* 111.1 (2018): 1–38.