

The original version of this work, which is the one that should be cited, can be found via  
<<http://isaw.nyu.edu/publications/isaw-papers>>.

ISAW Papers 12 (2017)

## **P.Berl. 9825: An elaborate horoscope for 319 CE and its significance for Greek astronomical and astrological practice**

**Dorian Greenbaum and Alexander Jones**

<http://doi.org/2333.1/brv15m2n>

*Abstract:* The discovery of this elaborate horoscope in the Berlin papyrus collection is a milestone in the history of ancient horoscopes. The papyrus takes its place among very few such detailed horoscopes well preserved from antiquity. This paper discusses both the astronomical and astrological details of P.Berl. 9825, enumerating its contents and situating it within the broader historical and cultural context of astrological material from western antiquity. The first section outlines the physical details of the papyrus, its paleography, and the layout of the material among the different sections of the papyrus. It consists of seventeen columns spread among four framed sections. The beginning of the papyrus is lost, but enough remains to allow reconstruction of the date and time of the horoscope, in addition to the positions of the missing luminaries and planet (Saturn). A transcription and translation with apparatus and textual notes follow. A commentary in three parts follows the first section. Part 1 contains restorations, confirmations and corrections. This includes both a tabular summary of the data given in the horoscope, and a diagrammatic representation of the data. Part 2 consists of an astronomical commentary, comparing the astronomical data in the papyrus with Ptolemy's *Almagest* and modern theory, to demonstrate that the horoscope was constructed using tables distinct from Ptolemy's, though of comparable quality. The commentary also includes analysis of solar and lunar data, planetary latitudes, and fixed stars "co-rising" with the longitudes of the relevant heavenly body. Part 3 is an astrological commentary. Comparisons with other elaborate horoscopes are made, in addition to analysis of the astrological techniques based on the data provided. Because this is the only extant example of a documentary horoscope containing all seven of the "planetary" lots of Paulus Alexandrinus, there is a more extensive discussion of the lots used here within their historical and cultural context.

*Library of Congress Subjects:* Astronomy--History, Astrology--History, Horoscopes, Zodiac.

## **Contents**

- Introduction
- Text
- Apparatus
- Translation
- Commentary
  - Part I: Restorations, confirmations, and corrections.
  - Part II: Astronomical commentary.
  - Part III: Astrological commentary
- Notes
- Manuscripts
- Bibliography

## Introduction

### Elaborate horoscopes

The surviving corpus of about 350 currently known Greek horoscopes, comprising roughly equal numbers of original documents from antiquity and exemplary horoscopes preserved through the medieval manuscript tradition, is collectively an invaluable source of data relating to the practices of personal astrology and astronomical calculation in the Greco-Roman world.<sup>1</sup> Considered singly, on the other hand, few of these horoscopes stand out as especially informative documents for the historian. Most are what we might call “minimal” horoscopes, recording no more than the individual’s name, birthdate, and birthtime and the zodiacal signs occupied by the Sun, Moon, planets, and ascendant at that date and time. A horoscope of this type frequently called for only a small ticket-like piece of papyrus.

The remaining minority of horoscopes go beyond the minimal format by providing greater precision in the data, or more kinds of data, or both. Greater precision typically means specifying longitudes of heavenly bodies and astrologically significant points in degrees (with or without fractions) rather than just by zodiacal signs. Additional data may be strictly astronomical, such as latitudes of heavenly bodies, cardines other than the ascendant, or dates and longitudes of syzygies close to the birthdate, or astrological, such as lots and dignities.<sup>2</sup> A few types of additional data, for example cardines or house rulers, may appear in horoscopes that specify only zodiacal signs without degrees, but most depended on knowledge of precise longitudes in degrees, and hence only appear in horoscopes that also give that additional precision in the longitudes.

Four papyrus horoscopes in Neugebauer and Van Hoesen’s *Greek Horoscopes*, all for birthdates within a span of about a half century from the late first century CE to the mid second, exemplify a loose genre that can be characterized as “elaborate” or “deluxe” horoscopes (years cited in this paper are CE unless otherwise indicated):<sup>3</sup>

- P.Lond. 1.130 (Hor. gr. 81.III.31 = GH 81), 81 April 1
- P.Lond. 1.98 (Hor. gr. 95.IV.13 = GH 95), 95 April 13
- P.Lond. 1.110 and P.Paris 19 (Hor. gr. 137.XII.4 = GH 137b and 137a), 137 December 4
- P.Paris 19bis (Hor. gr. 137.XII.4 = GH 137c), 137 December 4

(P.Lond. 1.110 and P.Paris 19 are two copies of the same text, whereas P.Paris 19bis is a different horoscope with respect to both the wording and the data though computed for the same individual’s birthdate.) In comparison to the general run of papyrus horoscopes, these elaborate horoscopes stand out in the first instance on account of their scale, since they are composed as prose texts—not mere lists of

data—that take up more than one column of a length of papyrus roll, while giving precise longitudes in degrees as well as an abundance of astrological data. A hard-and-fast definition of what constitutes an elaborate horoscope is not a straightforward matter, because each example differs in details of expression and in the range of data. A reasonable working criterion, however, would be the inclusion of the planetary rulers of the terms (ῥοια) occupied by the heavenly bodies and astrologically significant points, since these are provided in all four roll-format horoscopes cited above and, when they appeared at all in a horoscope, they would have been frequent enough to be likely to occur even in a comparatively small surviving fragment. Defining them in this way, we can currently identify 26 elaborate papyrus horoscopes, roughly half of which have a preserved or deducible birthdate while the rest are only roughly datable, usually by paleography:<sup>4</sup>

*Exact birthdate known*

- P.Oxy. 2.307 (Hor. gr. 46.I.3 = GH 46), 46 January 3
- P.Oxy. 31.2555 (Hor. gr. 46.V.13 = OG 46), 46 May 13
- P.Oxy. astr. 4236 (Hor. gr. 63.XI.25), 63 November 25
- P.Lond. 1.130 (Hor. gr. 81.IV.1 = GH 81), 81 April 1
- P.Oxy. astr. 4237 (Hor. gr. 84.IX.6), 84 September 6
- P.Lond. 1.98 (Hor. gr. 95.IV.13 = GH 95), 95 April 13
- P.Lond. 1.110 and P.Paris 19 (Hor. gr. 137.XII.4 = GH 137b and 137a), 137 December 4
- P.Paris 19bis (Hor. gr. 137.XII.4 = GH 137c), 137 December 4
- P.Oxy. astr. 4245 (Hor. gr. 218.XI.27), 218 November 27/28
- P.Berl. 9825 (Hor. gr. 319.XI.18-19), 319 November 19
- PSI 1.23.a (Hor. gr. 338.XII.24 = GH 338), 338 December 24
- P.Kellis 1.84 (Hor. gr. 373.V.16), 373 May 16<sup>5</sup>
- P.Oxy. 65.4477 (Hor. gr. 430.VII.8), 430 July 7

*Roughly dated*

- P.Oxy. astr. 4279 (Hor. gr. 50-150a), c. 100
- P.Oxy. astr. 4280 (Hor. gr. 50-150b), c. 100
- P.Princ. 2.75 (Hor. gr. 138-161 = GH 138/161), 138-161 (reign of Antoninus Pius)
- P.Oxy. astr. 4281 (Hor. gr. 100-200a), c. 150
- P.Berl. 21347 (no Hor. gr. number), c. 150
- P.Oxy. astr. 4276 (Hor. gr. 150-250a), c. 200
- P.Oxy. astr. 4277 (Hor. gr. 150-250b), c. 200
- P.Ryl. 3.524 (Hor. gr. 200-300<sup>b</sup> = GH 250,2), c. 250
- P.Oxy. astr. 4285 (Hor. gr. 200-300c), c. 250
- P.Lips. inv. 414 ined. (no Hor. gr. number), c. 250<sup>6</sup>
- P.Oxy. astr. 4284 (Hor. gr. 250-300a), c. 275
- P.Oxy. astr. 4282 (Hor. gr. 250-350a), c. 300
- P.Oxy. astr. 4283 (Hor. gr. 250-350b), c. 300

Making due allowance for the uncertainties of paleographical dating—an uncertainty of  $\pm 50$  years is a reasonable assumption—the chronological distribution of the elaborate horoscopes is surprisingly uniform from the mid first through the mid fourth century (Fig. 1), and such horoscopes were still being produced well into the fifth.

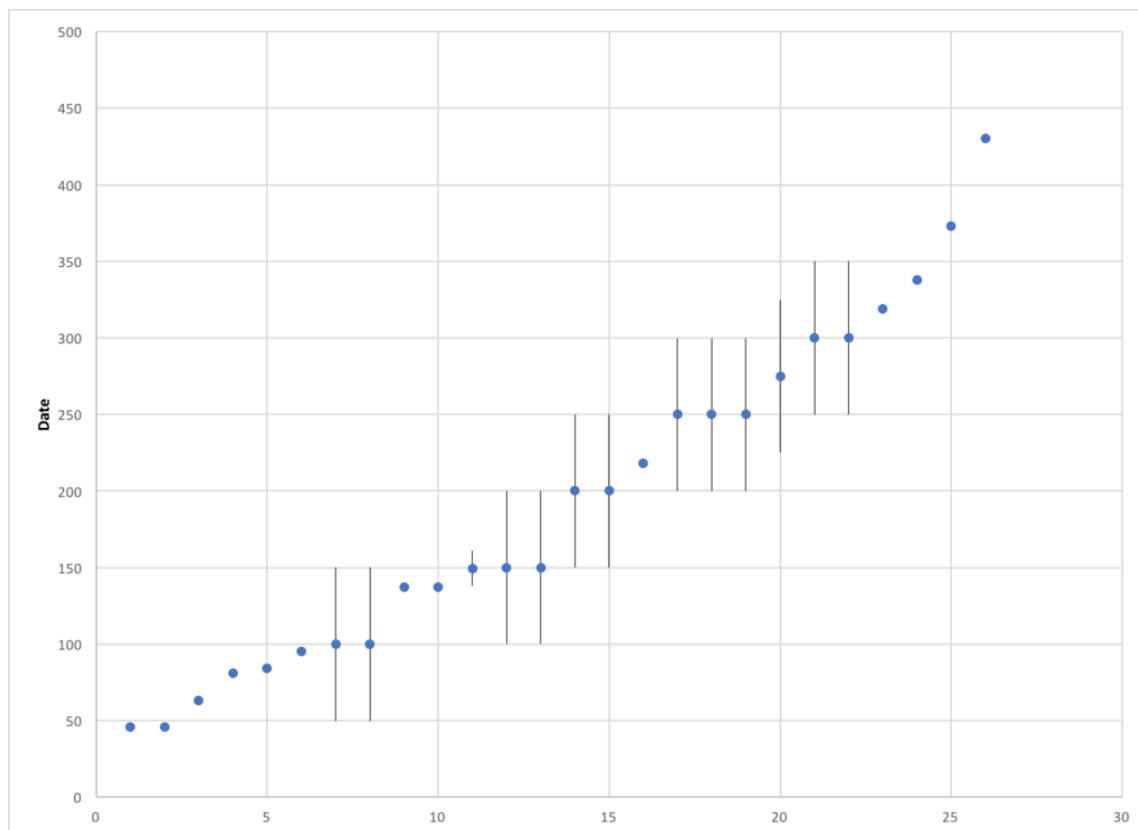


Fig. 1. Chronological distribution of elaborate horoscopes on papyrus, ordered by known or estimated date. Bars indicate suggested uncertainties of date.

### P.Berl. 9825.

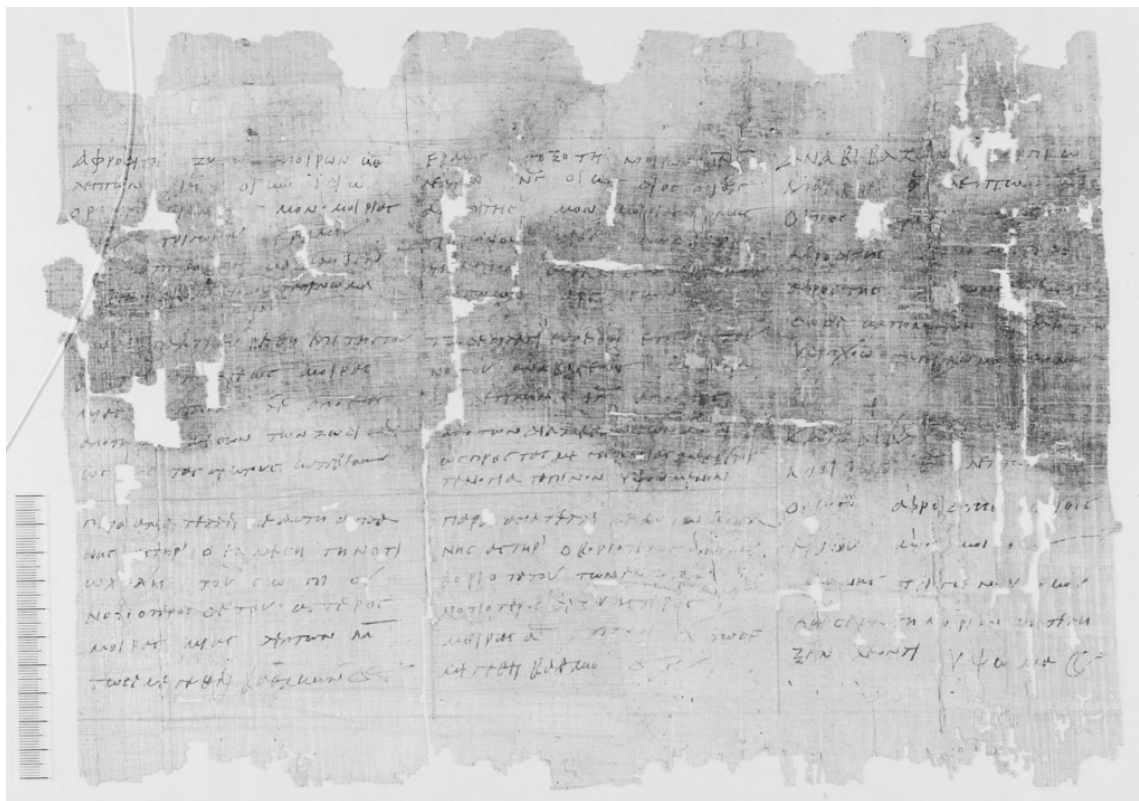
An elaborate horoscope, if well preserved, provides a kind of snapshot of the astronomical resources available to the astrologer who produced it, as well as the range and methods of derivation of the elements considered to be relevant for a detailed astrological prognostication. Its historical value is enhanced if its contents can be brought into relation with other evidence for astronomical and astrological methods available at the time. The papyrus horoscope discussed in the present article, P.Berl. inv. 9825, meets these conditions to an exceptional degree.<sup>7</sup>

At present P.Berl. 9825 is mounted in four glass frames designated A through D (Figs. 2-5). The parts in A (42.5 x 27.0 cm), B (38.6 x 27.4 cm), and C (40.5 x 27.6 cm) were originally continuous, in that order from left to right, and their joining edges are mostly preserved, forming an aggregate stretch of roll of dimensions 119.3 x 27.6 cm. The part in D (25.7 x 26.6 cm) was certainly to the right of that in C, but their edges do not join, though it is doubtful whether much is missing between them. Assuming that the lost column pertaining to the Sun and the incomplete one for the Moon (i) were the same width as the columns for the planets and nodes (ii-vii), the complete horoscope was at least 164 cm wide, not counting margins—more if there was an introductory section to the left of the Sun's column. The upper and lower margins are intermittently preserved to respectively about 4 cm and 3 cm from the top and bottom rulings containing the horoscope.



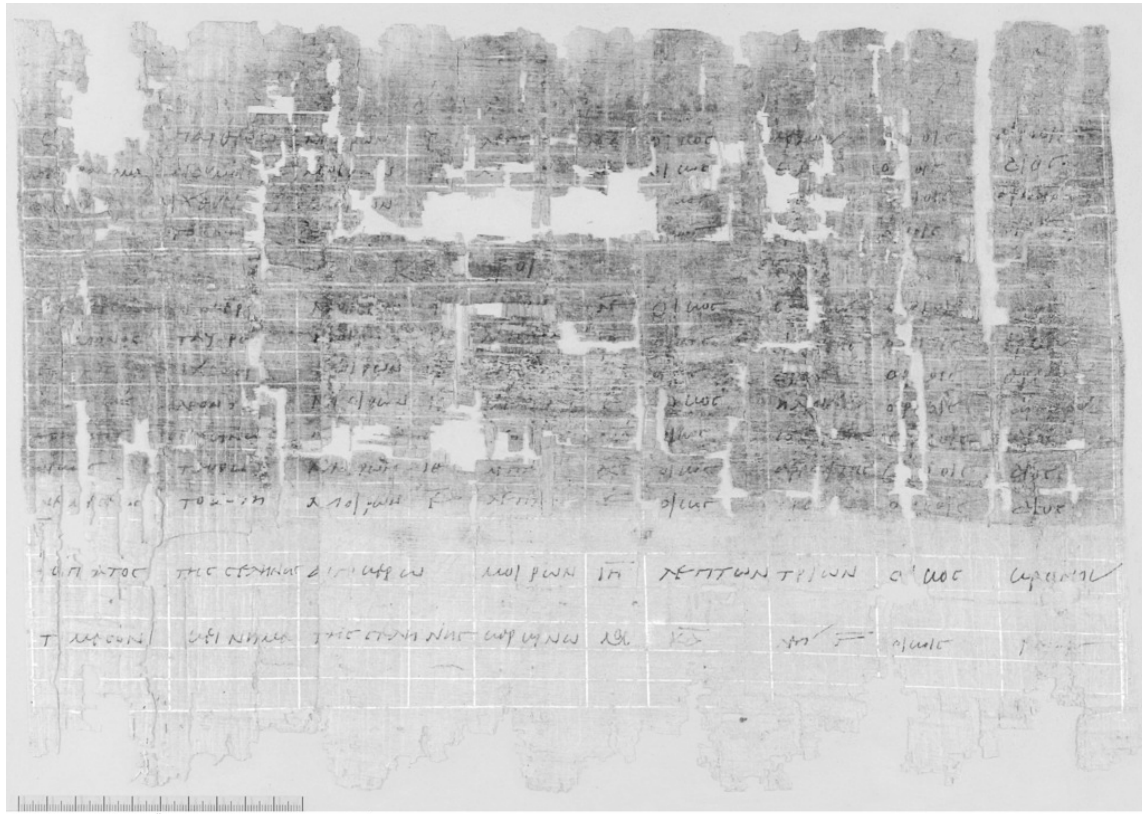
© Sandra Steiß - SMB Ägyptisches Museum und Papyrussammlung

Fig. 2. P.Berl. 9825 frame A, cols. i-iv. ©Sandra Steiß – SMB Ägyptisches Museum und Papyrussammlung.



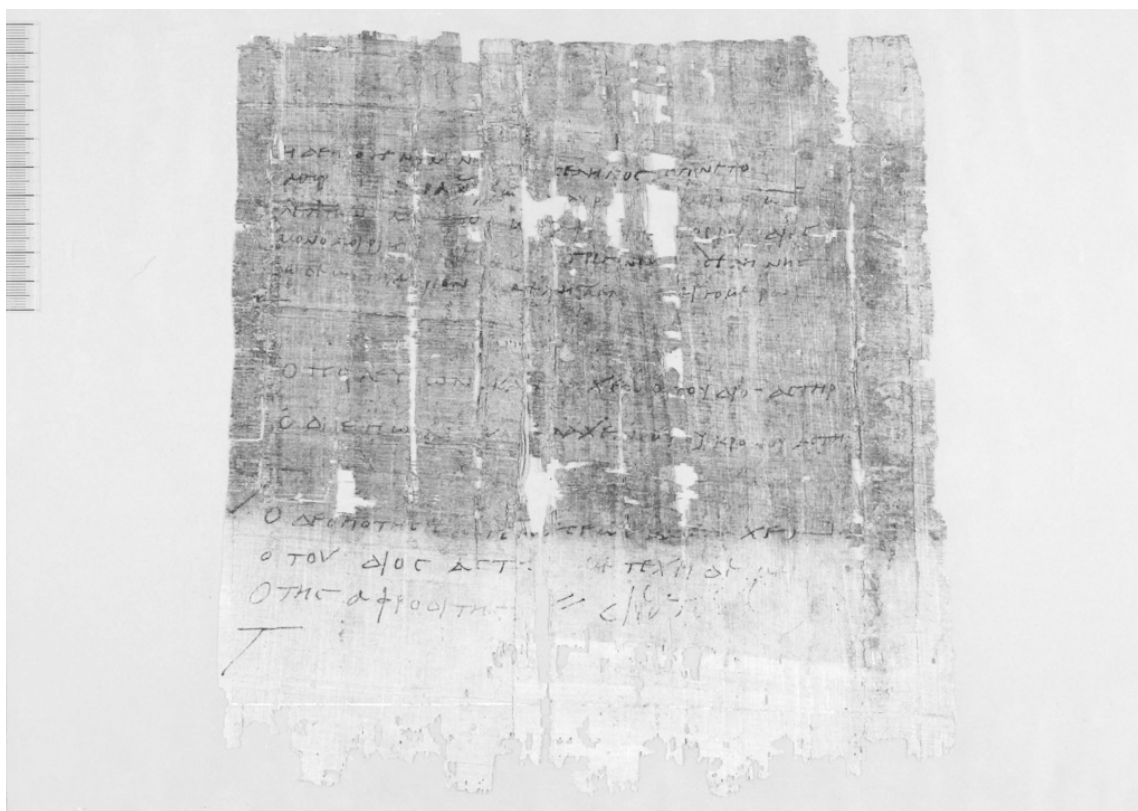
© Sandra Steiß - SMB Ägyptisches Museum und Papyrussammlung

Fig. 3. P.Berl. 9825 frame B, cols. v-vii. ©Sandra Steiß – SMB Ägyptisches Museum und Papyrussammlung.



© Sandra Steiß - SMB Ägyptisches Museum und Papyrussammlung

Fig. 4. P.Berl. 9825 frame C, cols. viii-xvii. ©Sandra Steiß – SMB Ägyptisches Museum und Papyrussammlung.



© Sandra Steiß - SMB Ägyptisches Museum und Papyrussammlung

Fig. 5. P.Berl. 9825 frame D, col. xviii. ©Sandra Steiß – SMB Ägyptisches Museum und Papyrussammlung.

According to the records of the Berlin papyrus collection, the greater part of P.Berl. 9825 was purchased by Otto Rubensohn in 1902 from the “Papyrus Fund”; additionally four fragments in frame A (now joined) were obtained as a gift from the Sächsische Gesellschaft der Wissenschaften, and one as part of an exchange with the Giessen papyrus collection. We thus have no information about the precise provenance, beyond the fact (shown in the astronomical commentary below) that the ascendant of the horoscope was computed for a locality on the parallel through Syene—which of course tells us where the native was born but not necessarily where the horoscope itself was composed.

The horoscope is written in a neat but not calligraphic hand, consistent with the fourth century dating we will deduce from the contents. Words are separated by, but also sometimes rather capriciously split by, spaces; occasional rising diagonal strokes function as quasi-punctuation marking ends of sentences or sections. Phonetic deviations from standard orthography are frequent, for example  $\alpha \leftrightarrow \epsilon$ ,  $\epsilon \leftrightarrow \iota$ . The text is mostly written out, though with one instance each of common abbreviations or symbols for μοῖραι (degrees), λεπτά (minutes), ὠροσκόπος (ascendant), and Σελήνη (Moon).

The horoscope, so far as it is preserved, can be divided according to its layout into four parts, each of which is contained in a tabular framework ruled in red. The first part comprises columns i through vi, and is divided vertically into three roughly equal registers. Each column contains data pertaining to one of the Moon and five planets. The top register gives a string of astronomical and astrological data concerning the heavenly body’s longitude; the middle one gives astronomical data concerning its latitude; and the bottom register gives astronomical data concerning a fixed star in the zodiacal belt that was close in longitude to the heavenly body. The second part comprises column vii, and has two registers, pertaining respectively to the ascending and descending node of the Moon; their contents are similar to those of the top register in



cols. i-vi. The third part is a table of ten columns of varying width (viii-xvii) and eighteen rows. The top four rows give data concerning the four cardines; then, following a header row, come seven rows with data concerning seven lots; of the remaining six rows, two contain astronomical data concerning the Moon while the other four are vacant. The last part, comprising col. xviii, contains astronomical and astrological data concerning the full Moon immediately preceding the nativity, further astrological data concerning the nativity, and a closing formula.

### Text

	i	ii	iii
5	[Cελήνη Καρκίνω μοιρών $\bar{\alpha}\zeta$ ] [λεπών <i>nn</i> , οίκος ἴδιος, ὀρίοις] [Κρόνου, μονομοιρία Ἀφροδίτης,] [τριγώνω Ἀφροδ]ίτης, [δωδε-] [κατημόριον κατέλ]ηξε[ν] Διδύ[μο]ις, [ὑψωμα Διός, ταπίνωμα] Ἄρεως	[Κρόνος Κρι]φ μοιρών [γ] [λεπών $\bar{\mu}\gamma$ ], οίκος Ἄρεω[ς], [ὀρίοις Διός], μονομοιρία Ἐρμου, τριγώνω Διός, δωδε[κατημόριον] κα[τ]έληξε[ν] Τάυ[ρο]φ, ὑψωμα Ἡλίου, ταπίνωμα [Κ]ρ[ό]νου.	Ζεὺς Παρθένω μοιρών $\zeta$ [λεπών $\bar{\mu}$ , οίκος Ἐρμου], ὀρίοις Ἐρμου, μονομοιρία ἰδία, [τριγώνω] Κρόνου, δωδε[κατημόριον] κα[τ]έληξε[ν] [Ζυγώ], ὑψωμα Ἐρμου, ταπίνωμα Ἀφροδίτης.
10	[τῷ δὲ πλάτι εὐρέθη ἐπὶ τῆς τοῦ νοτίου καταβάσεως μοιρών $\bar{\delta}$ [ <i>nn</i> λεπών <i>nn</i> , ἀποστάς ἀπὸ] τῶν διὰ] [μέσων τῶν ζωδίων ὡς πρὸς] [τάς μεσημβρίας, καταβ]ένω[ν] [κα τὰ νότια.]	[τῷ δὲ πλάτι] εὐρέθη ἐπὶ τῆς τοῦ [- 9 - ]αβάσεως μοίρ[α] [ ] $\bar{\alpha}$ [λεπών <i>xx</i> ], ἀποστάς ἀπὸ τῶ[ν] [διὰ μέσων] τῶν ζωδίων ὡς πρὸς [- 5 - ] [ ] $\bar{\alpha}$ [καταβένων] [ ] τὰ βόρια./	τῷ δὲ πλάτι] εὐρέθη ἐπὶ τῆς τοῦ [βορίου] καταβάσεως μοιρών [λεπών $\bar{\alpha}\beta$ , ἀποστάς ἀπὸ] τῶν διὰ μέσων τῶν ζωδίων [ὡς] πρὸς τὰς ἄρκτους, καταβένω[ν] [τὰ] βορίου./
15	[παρὰ ἀνατέλλει δὲ αὐτῇ] ἀπλα- [νῆς ἀστήρ] [ ] [ ] [ ] [ ] $\bar{\gamma}$ .	[παρὰ ἀνατέλλει] δὲ [αὐτῷ ἀπλανῆς] [ἀστήρ] τῶν [ἐν τῇ κεφαλῇ τοῦ] [Κριού] γ' ὁ ἡγούμενος, [βοριότερος] δὲ τ[ο]ῦ ἀστερος [ ] [ ] [ ] [ ]	[παρὰ ἀνατέλλει δὲ αὐτῷ] ἀπλανῆ ἀστήρ ὁ ἐπόμενος τῆς νοτίου περὶ τῆς [Παρθένου, βοριότερος] δὲ τοῦ [ἀστερος] μοιρών $\bar{\alpha}\zeta$ οὐδεμίαν λεπών [τ], τῷ δὲ μεγέθει βαθμῶν $\bar{\gamma}$ ./
20			
	iv	v	vi
5	Ἄρης Σκορπίω μοιρών $\bar{\alpha}\beta$ λεπών $\bar{\lambda}\beta$ , οίκω ἰδίω, ὀρίοις Διός, μονομοιρία Ἡλίου, [τριγώνω] Ἀφροδίτης, [δωδεκατημόριον κατέληξε] [Λέοντι], ταπίνωμα Cε[λ]ήνης.	Ἀφροδίτη Ζυγῷ μοιρών $\bar{\alpha}\beta$ λεπών $\bar{\mu}\eta$ , οίκω ἰδίω, ὀρίοις Κρόνου, μονομοιρία Ἐρμου, τριγώνου Ἐρμου, δωδεκατημόριον κατέληξε Ζυγῷ, ὑψωμα Κρόνου, ταπίνωμα Ἡλίου	Ἐρμῆς Τοξότη μοιρών $\bar{\iota}\gamma$ λεπών $\bar{\nu}\gamma$ , οίκος Διός, ὀρίοις Ἀφροδίτης, μονομοιρία Ἄρεως, τριγώνω Διός, δωδεκατημοριον κατέληξε [Ταύρου] δικώμω ἄρεω(κ)ών.
10	τῷ δὲ πλάτι εὐρέθη ἐπὶ τῆς τοῦ νοτίου καταβάσεως μοιρών $\bar{\tau}$ λεπών $\bar{\alpha}$ , [ἀπο]στάς ἀπὸ τῶν διὰ μέσων τῶν ζωδίων ὡς πρὸς τὰς μεσημβρίας, καταβένω(v).	τῷ δὲ πλάτι εὐρέθη ἐπὶ τῆς τοῦ βορίου ἀναβάσεως μοίρα[ς] μίας [λεπών $\bar{\lambda}\epsilon$ , ἀποστάς ἀπὸ τῶν διὰ] μέσων τῶν ζωδίων ὡς πρὸς τὰς ἄρκτους, καταβένω[ν].	τῷ δὲ πλάτι εὐρέθη ἐπὶ τῆς τοῦ νότου ἀναβάσεως μοιρών $\bar{\alpha}$ λεπών $\bar{\iota}\gamma$ , ἀποστάς ἀπὸ τῶν διὰ μέσων τῶν ζωδίων ὡς πρὸς τὰς μεσημβρίας, ἀναβένω[ν] τὰ νότια, ταπινόν, ὑψόμενον.
15	παρὰ ἀνατέλλει δὲ αὐτῷ ἀπλανῆς ἀστήρ ὁ ἐπόμενος τῶν ἐν τῷ εἰρησίου τοῦ Σκορπίου, νοτιότερος δὲ τοῦ ἀστερος μοιρών $\bar{\epsilon}$ λεπών $\bar{\lambda}$ ,	παρὰ ἀνατέλλει δὲ αὐτῇ ἀπλανῆς ἀστήρ ὁ ἐν μέσῃ τῇ νοτίου χήλῃ τοῦ Σκορπίου, νοτιότερος δὲ τοῦ ἀστερος μοίρα[ς] μίας λεπών $\bar{\mu}$ ,	παρὰ ἀνατέλλει δὲ αὐτῷ ἀπλανῆς ἀστήρ ὁ βοριότερος ἀπὸ τοῦ βοριότατου τῶν ἐν τῷ τόξῳ, νοτιότερος δὲ τ[ο]ῦ ἀστερος μοίρα[ς] $\bar{\alpha}$ [λε]πών $\bar{\lambda}$ , τῷ δὲ

20 | τῷ δὲ μεγέθει βαθμῶν γ̄./ | τῷ δὲ μεγέθει βαθμῶν δ. | μεγέθει βαθμῶ[ν] δ̄ γ̄./

vii

5 Ἀναβιβάζων [Cκ]ορπίω  
μοιρῶν θ̄ λεπτῶν μ̄,  
οἶκος Ἄρσεως, ὀρίοις  
Ἀφροδίτης, μονομοιρία  
Ἀφροδίτης, τριγώνῳ Ἀφροδίτης,  
δωδεκατημόριον κατέληξεν  
Ἵδρηγόφ, ταπίνωμα Cελήνης.

10 Καταβιβάζων Ταύ[ρω]  
μοιρῶν θ̄ λεπτῶν μ̄,  
οἶκος Ἀφροδίτης, ὀρίοις  
Ἑρμοῦ, μον[ο]μοιρία  
[C]ελήνης, τριγώνου Ἑρμοῦ,  
δωδεκατημόριον κατέλη-  
15 ξεν Λέοντι, ὕψωμα (Cελήνης).

viii ix x xi xii xiii xiv xv xvi xvii

	Ἦρ(οσκόπος)	Παρθένῳ	μοιρῶν	τ̄	λεπτῶν	ν̄ξ̄	οἶκος	Ἑρμοῦ	ὀρίοις	Ἀφροδίτης
	Μεσ[ου]ράνημα	Διδύμοις	μοιρῶν	π̄ ]	λεπτῶν]	- -	οἶκος	Ἑρμ[ο]ῦ	ὀρίοις	Διός
	Δύει[ς]	Ἰχθύσι	μοιρῶν	[τ̄]	[λεπτῶν]	ν̄ζ̄]	[οἶ]κος	[Δι]ὸ[ς]	ὀρίοις	Ἀφροδίτης
5	Ἵπόγ[ειον]	Τοξότη	μ[οιρῶ]ν	[τ̄]	λεπτῶν]	[ - ]	[οἶ]κος	Δι[ὸς]	ὀρίοις	Διός
		κλ	ἦροι							
	Τύχη	Αἰγόκερῳ	μοιρῶν	θ̄	[λε]πτῶν	λε̄	οἶκος	Κρόνου	ὀρίοις	Διός
	Δαί[ι]μονος	Ταύρω	μοιρῶν	π̄β	λεπτῶν	π̄θ	οἶκος	Ἀφ[ρο]δίτης	ὀρίοις	Ἑρμοῦ
	Ἑρως	Ἰχθύσι	μοιρῶν	π̄γ	[λε]πτῶν	ν̄η	οἶκος	Διός	ὀρίοις	Ἄρσεως
10	Ἀνάγκη	Λέοντι	μοιρῶν	π̄ε	λεπτῶν	π̄ε̄	οἶκος	Ἡλίου	ὀρίοις	Κρόνου
	Τόλμη	Καρκίνῳ	μ[οιρῶ]ν	π̄ζ̄]	λεπτῶν]	ν̄δ̄	οἶκος	Cελήνης	ὀρίοις	Διός
	Νίκη	Ταύρω	μοιρῶν	π̄θ	λεπτῶ[ν]	λε̄ξ̄	οἶκος	Ἀφροδίτης	ὀρίοις	Διός
	Νεμέσως	Τοξότη	μοιρῶν	ε̄	λεπτῶ[ν]	ε̄	οἶκος	Διός	ὀρίοις	Διός
15	τὸ πλατος	τῆς Cελήνης	Αἰγόκερῳ		μοιρῶν	π̄η	λεπτῶν	τριῶν	οἶκος	Κρόνου
	τὸ μέσον	κείνημα	τῆς Cελ	ήνης	Καρκίνῳ	μο(ιρῶν)	π̄δ̄	λεπ(τῶν) γ̄	οἶκος	ιδίους

xviii

5 ἡ δὲ π[ρ]ογενομ[έ]νη πανσέληνος ἐγένετο  
Ἄθῆρ τ̄ξ̄, ὥρα ξ̄ . . . Ταύρω μοιρῶν π̄  
λεπτῶν λ̄, οἶκ[ω] Ἀφροδίτη[ς], ὀρίοις Διός,  
μονομοιρία Ἡ[λί]ου, τριγώνου Cελήνης,  
δωδεκατημόριον [κ]ατέληξεν Αἰγόκερῳ.  
-----  
ὁ πολεῦων κατέλαχεν ὁ τοῦ Διὸς ἀστήρ.  
ὁ διέπων κατέλαχεν ὁ τοῦ Κρόνου ἀστήρ'.  
-----  
ὁ δεσπότης τῆς γενέσεως κατέλαχεν

10 ὁ τοῦ Διὸς ἀστήρ, μετέχει δὲ καὶ  
ὁ τῆς Ἀφροδίτης. // διευτυχε[ι].

## Apparatus

i.

7 l. ταπεινώμα | 9 l. πλάτει | 11-12 l. τοῦ διὰ μέσων | 13 [[α]]' overwritten, l. καταβαίνουσα | 15 l. παρανατέλλει

ii.

3 l. οἰκῶ | 5 Ἐ: unidentifiable speck of ink | 7 l. ταπεινώμα | 9 l. πλάτει | 11-12 l. τοῦ διὰ μέσων | 13 l. καταβαίνων | 14 l. βόρεια | 15 l. παρανατέλλει | 18 l. βορειότερος

iii.

3 l. οἰκῶ | 4 l. μονομοιρία ἰδίᾳ | 7-8 l. ταπεινώμα | 9 l. πλάτει | 10 l. βορείου | 11 : the bottom of a small loop, consistent with either alpha or beta, with no visible trace of an overbar | 12 l. τοῦ διὰ μέσων | 13-14 l. καταβαίνων τὰ βόρεια | 15 l. παρανατέλλει | 16 l. ἀπλανῆς | 19 [[ων]]' ac' crossed out and corr. above the line

iv.

3 ἰδιω | 4 l. μονομοιρία | 5 Ἡ[λ]ιου: traces of tops of letters | 6 l. δωδεκατημόριον | 7 l. ταπεινώμα | 9 l. πλάτει | 12 l. τοῦ διὰ μέσων | 13 καταβένω, l. καταβαίνων | 15 l. παρανατέλλει δὲ

v.

3 ἰδιω | 4 l. μονομοιρία | 5 l. τριγώνω | 7 l. ταπεινώμα | 9 l. πλάτει | 12 l. τοῦ διὰ μέσων | 13 l. καταβαίνων | 15 l. παρανατέλλει

vi.

3 l. οἰκῶ | 4 l. μονομοιρία | 6 l. Ταύρω | 7 l. ἀρσενικῶ | 9 l. πλάτει | 12 l. τοῦ διὰ μέσων | 13 l. ἀναβαίνων | 14 l. ταπεινὸν | 15 l. παρανατέλλει | 16 l. βορειότερος | 17 l. βορειοτάτου

vii.

4 l. οἰκῶ | 5 l. μονομοιρία | 8 l. Ὑδροχόω | l. ταπεινώμα | 11 l. οἰκῶ | 12 l. μονομοιρία | 13 l. τριγώνω | l. c

viii.

2 omega-rho digraph

ix.

17 l. κίνημα

xiii.

17 ~~Ϟ~~

xiv.

2-5, 7-13 l. οἶκω

xv.

17 λεπ'

xvi.

15, 17 l. οἶκω

xvii.

17 l. ἰδίω

xviii.

5 l. μονομοιρία | l. τριγώνω

**Notes on the Apparatus**

1. A few slight traces of writing survive immediately above the top ruling of cols. ii and iii. If this text belonged to the horoscope, it might have identified the native and stated the date and place of birth.

i.

2-7. The identities of the heavenly bodies of cols. i and ii can be extrapolated from the sequence Jupiter, Mars, Venus, Mercury of cols. iii-vi which shows that one of the conventional orders of the heavenly bodies for Greek horoscopes (Neugebauer & van Hoesen 1959, 164),  $\text{♃♄♀♃♁}$  or (clearly in this instance)  $\text{♁♃♄♀♃}$  was followed. The text of i 2-7 is restored on analogy with the top registers for the other heavenly bodies. The zodiacal sign Cancer is inferred from the preserved closing word, which must belong to the formula specifying which heavenly bodies have their exaltation and depression in the sign. For 26 as the number of degrees, see Commentary II; as shown there, the number of minutes would have been around 30.

9-14. Restored on analogy with the middle registers for the other heavenly bodies, taking into account the known longitudes of the Moon and the ascending node.

15-19. The formula is restored on analogy with the bottom registers for the other heavenly bodies. For a likely identification of the zodiacal star named in this section see the Commentary II.

ii.

2-8. For the restorations of the longitude and *monomoiria* see Commentary I.

9-14. The indication “descending the north,” if not simply a mistake, implies that Saturn’s latitude was given the wrong sign; see Commentary II.

15-20. For the identity of this star (which is not the expected one) and restorations of the associated data see Commentary II. The traces of writing in line 19 are mere specks, too slight to determine which letters they belong to; the restoration of the line would be  $\mu\omicron\iota\omicron\omega\nu \xi \lambda\epsilon\pi\tau\omega\nu \bar{\alpha}$ .

iii.

2-8. See Commentary I for demonstration that the longitude 7° 40' is an isolated scribal error for 3° 40'. The *dodekatemorion* is restored assuming 3° 40'.

11. The degrees of latitude could have been either 1 or 2 according to the surviving trace.

15-20. For the identity of the star see Commentary II; the correct name would be “the one on *the tip of the southern wing of the Maiden*” (ἐπ’ ἄκρας misread here as ἐπόμενος).

iv.

7. The *dodekatemorion* is restored from the longitude.

13. Here and in col. iv the indication of the planet’s trend in latitude is not followed by the direction north or south; perhaps it was seen as redundant.

15-20. For the identity of the star see Commentary II.

v.

15-20. For the identity of the star see Commentary II.

vi.

7. Such attributes of zodiacal signs appear only in this column, perhaps taking the place of the indications of exaltation and depression which are not applicable to Sagittarius.

14. The indications “depressed, exalted” are unexpected here and unclear in meaning; perhaps their presence is somehow related to the absence of any exaltation or depression in Sagittarius.

15-20. For the identity of the star see Commentary II; the correct name would be “the *second* one from the most northerly of those on the bow” (β̄, i.e. δεύτερος, misread here as βορειότερος). The star in question has magnitude 3 according to Ptolemy; it is not clear why the horoscope appears to give two numbers for the magnitude.

viii-xvii.

3-4. The degrees and minutes of the Setting and Lower Midheaven would have been identical to those of the Ascendant and Midheaven respectively.

11. For the restoration of the degrees see Commentary I.

15. See Commentary II for the problem of the meaning of this line.

xviii.

2. Following the hour number, “of day” (ἡμέρας, likely abbreviated) is expected; the traces are difficult to make sense of, however.

## Translation

	i	ii	iii
		...	
5	[Moon in Cancer 26°] [ <i>nn'</i> , in its own house, in the terms of] [Kronos, in the <i>monomoiria</i> of Aphrodite,] [in the trigon of] Aphrodite, [the <i>dode-</i> <i>katemorion</i> ] fell in Gemini, [exaltation of Zeus, depression] of Ares.	[Kronos in Aries 3°] [43'], in the house of Ares, [in the] [terms of Zeus], in the <i>monomoiria</i> [of Hermes], in the trigon of Zeus, the <i>dodekatemorion</i> fell in Taurus, [exaltation] of the Sun, depression of Kronos.	Zeus in Virgo 7° 40', in the house of Hermes, in the terms of [Hermes], in its own <i>monomoiria</i> , in the trigon of Kronos, the <i>dode-</i> <i>katemorion</i> fell [in Libra], exaltation of Hermes, depression of Aphrodite.
10	[In latitude it was found in] the [descent of the south], 4° [ <i>nn'</i> , standing away from] [the ecliptic] towards	[In latitude] it was found in the [de/a]scent of the [south/north], 1° [ <i>nn'</i> ], standing away from the ecliptic [towards]	In latitude it was found in the descent of the [north], <i>n</i> ° 22', standing away from the ecliptic

	[the south], descending [the south.]	... descending the north.	towards the north, descending the north.
15	[With it rises] a fixed [star... ] [ ] [ ] [ steps in magnitude] 3.	With it rises a fixed star, the leading one of the 3 [on the] [head of the Ram], being [north] of the star [7° 30'], steps in magnitude 3.	With it rises a fixed star, the trailing one of the southern wing of the Maiden, being north of the star 0° 10', steps in magnitude 3.
20			

	iv	v	vi
5	Ares in Scorpio 22° 32', in its own house, in the terms of Zeus, in the <i>monomoiria</i> of the Sun, in the trigon of Aphrodite, the <i>dodekatemorion</i> fell [in Leo], depression of the Moon.	Aphrodite in Libra 29° 18', in its own house, in the terms of Kronos, in the <i>monomoiria</i> of Hermes, in the trigon of Hermes, the <i>dodekatemorion</i> fell in Libra, exaltation of Kronos, depression of the Sun.	Hermes in Sagittarius 13° 53', in the house of Zeus, in the terms of Aphrodite, in the <i>monomoiria</i> of Ares, in the trigon of Zeus, the <i>dodeka-</i> <i>temorion</i> fell in Taurus, two-bodied, masculine.
10	In latitude it was found in the descent of the south, 0° 20', standing away from the ecliptic towards the south, descending.	In latitude it was found in the ascent of the north, 1° 35', standing away from the ecliptic towards the north, descending.	In latitude it was found in the ascent of the south, 1° 13', standing away from the ecliptic towards the south, ascending the south, depressed, exalted.
15	With it rises a fixed star, the trailing one of those on the breast of the Scorpion, being south of the star 5° 30', steps in magnitude 3.	With it rises a fixed star, the one on the middle of the southern claw of the Scorpion, being south of the star 1° 40', steps in magnitude 4.	With it rises a fixed star, the more northerly from the most northerly of those on the bow, being south of the star 1° 30', steps in magnitude 4, 3.
20			

	vii
5	Ascending node in Scorpio 9° 40', in the house of Ares, in the terms of Aphrodite, in the <i>monomoiria</i> of Aphrodite, in the trigon of Aphrodite, the <i>dodekatemorion</i> fell in Aquarius, depression of the Moon.
10	Descending node in Taurus 9° 40', in the house of Aphrodite, in the terms of Hermes, in the <i>monomoiria</i> of the Moon, in the trigon of Hermes, the <i>dodekatemorion</i> fell in Leo, exaltation of the Moon.
15	

	viii	ix	x	xi	xii	xiii	xiv	xv	xvi	xvii
	Ascendant	Virgo	degrees	10	minutes	57	house	of Hermes	terms	of Aphrodite
	Midheaven	Gemini	degrees	10	minutes	<i>nn</i>	house	of Hermes	terms	of Zeus
	Setting	Pisces	degrees	[10]	minutes	5[7]	house	[of Zeus]	terms	of Aphrodite
5	Lower midheaven	Sagittarius	degrees	[10]	minutes	[nn]	house	of Zeus	terms	of Zeus

			lots						
	Fortune	Capricorn	degrees	9	minutes	35	house	of Kronos	terms of Zeus
	Daimon	Taurus	degrees	12	minutes	19	house	of Aphrodite	terms of Mercury
	Eros	Pisces	degrees	23	minutes	58	house	of Zeus	terms of Ares
10	Necessity	Leo	degrees	15	minutes	15	house	of the Sun	terms of Kronos
	Courage	Cancer	degrees	2[3]	minutes	54	house	of the Moon	terms of Zeus
	Victory	Taurus	degrees	19	minutes	36	house	of Aphrodite	terms of Zeus
	Nemesis	Sagittarius	degrees	5	minutes	5	house	of Zeus	terms of Zeus
15	The latitude	of the Moon	Capricorn		degrees	18	minutes	3	house of Kronos
	The mean	motion	of the	Moon	Cancer	degrees	24	3 minutes	house its own

xviii

5	<p>The preceding full Moon took place on Hathyr 17, hour 7... in Taurus 20° 30', in the house of Aphrodite, in the terms of Zeus, in the <i>monomoiria</i> of the Sun, in the trigon of the Moon, the <i>dodekatemorion</i> fell in Capricorn.</p> <p>-----</p> <p>The presiding (star): the star of Zeus held possession. The managing (star): the star of Kronos held possession.</p> <p>-----</p> <p>The master of the nativity: the star of Zeus held possession, and the (star) of Aphrodite also had a share (in the rulership). Farewell!</p>
10	

## Commentary

### Part I: Restorations, confirmations, and corrections.

The first part of our horoscope is missing, including any introductory information such as the name of the native, the date and place for which the horoscope was computed, the entire section devoted to the Sun, and nearly the whole section devoted to the Moon. Elsewhere some items of information are lost to holes, abrasion, and staining, or only partially legible, and what *can* be read may sometimes be affected by errors committed by the copyist or the original composer of the horoscope. Fortunately large parts of the text follow a repetitive formulaic structure, some missing data can be deduced from astronomical considerations, and most of the astrological data were derived from the astronomical data according to identifiable rules that can be put into reverse. The first part of our commentary is primarily concerned with restoring and, where necessary, correcting the data relating to the longitudes of the heavenly bodies and astrologically significant points; and the date, time, and geographical locality of the nativity. Further discussion of the astronomical and astrological data in their own right will follow in parts II and III respectively.

The longitudes were expressed as zodiacal sign, degrees, and minutes. The other information in the horoscope derived from the longitudes included the following:

- The house ruler. This was one of the Sun, Moon, and five planets, according to a recognized scheme that assigned one complete zodiacal sign to each of the Sun and Moon, and two to each of the planets. Thus knowing the house ruler identifies the sign itself either uniquely or as one of a pair. Our horoscope is very reliable with respect to house rulers.
- The terms ruler. Terms (ὄρια, literally, “boundaries”) were subdivisions of irregular length of the zodiacal signs, each having one of the five planets as its ruler. Our horoscope reliably follows the so-called Egyptian system of terms, which was by far the most commonly used of the several attested systems and which is completely known from multiple sources. If the zodiacal sign is known, knowing the terms ruler narrows the longitude to a range of degrees within the sign.
- The *monomoiria*. Each degree of a zodiacal sign was assigned to one of the seven heavenly bodies according to the following scheme. The first degree had the same ruler as the sign taken as a whole, while the rulers of the subsequent degrees cycled through the standard, so-called Chaldean order Saturn, Jupiter, Mars, Sun, Venus, Mercury, Moon. Thus if the zodiacal sign is known, knowing the *monomoiria* limits the longitude to a set of four or five single degrees spread out at intervals of seven degrees. Our horoscope is usually reliable with respect to *monomoiriai*, but there is one clear instance of error.
- The triplicity (or trigon). Each set of three zodiacal signs at intervals of four signs forms a triplicity, ruled by one of the seven heavenly bodies for diurnal naticities and another for nocturnal. Since the rulers given for the triplicities in our horoscope frequently conflict with the standard system, we have not made use of this information to establish or confirm the zodiacal signs.
- The *dodekatemorion*. This is a variety of scheme that associates either twelve or thirteen equal divisions of each sign of the zodiac with one of the zodiacal signs. The particular scheme used in our horoscope, as we infer from the data, takes the degrees of the longitude, disregarding the minutes, multiplies by thirteen, and counts the product from the beginning of the zodiacal sign to find the sign of the *dodekatemorion*. The *dodekatemoria* appear to have been consistently computed correctly.
- Exaltations and depressions. Each of the seven heavenly bodies has its exaltation in one zodiacal sign, and its depression in the diametrically opposite sign, according to a standardized system. Knowledge that a sign is the exaltation or depression of a particular body determines the sign. In our horoscope this information is reliable.
- Nearby fixed star. The bottom register of each column of the horoscope’s first part names a star that is close to the heavenly body. If the star is identifiable, it determines the body’s longitude within a few degrees.
- Lots. Lots are astrologically significant longitudes equal to a sum or difference involving the ascendant and some subset of the longitudes of the heavenly bodies. Our horoscope presents a system of seven lots whose formulas are given by Paulus Alexandrinus. The lots determine precise relations among the longitudes. The computations of lots in our horoscope have apparently been carried out carefully.

The papyrus preserves complete statements of the longitudes of Jupiter, Mars, Venus, Mercury, the ascendant, and the ascending and descending nodes. Saturn’s zodiacal sign can be deduced to be Aries, which together with Scorpio has Mars as its house ruler and which is the exaltation of the Sun and depression of Saturn. The Moon must be within a few degrees of its mean longitude, given as Cancer 24° 3', and the Sun within thirty degrees of Mercury and within sixty degrees of Venus, say between Scorpio 15° and Sagittarius 30°. Hence we have the following “low precision” data for establishing the date of the horoscope:

Saturn	Aries
Jupiter	Virgo
Mars	Scorpio
Venus	Libra (end)
Mercury	Sagittarius
Sun	Between Scorpio 15° and Sagittarius 30°
Moon	Cancer
Ascending node	Scorpio



Ascendant

Virgo

With the Sun in Scorpio or Sagittarius and the ascendant in Virgo, this is obviously a nocturnal nativity. We can narrow down the possible dates using the usual strategy for simple undated horoscopes, beginning with the combination of Saturn's and Jupiter's positions.<sup>8</sup> Limiting consideration on the basis of the papyrus's paleography to years between 200 and 500 CE, and allowing generous margins beyond the sign boundaries, the combination Saturn in Aries, Jupiter in Virgo would be possible for the following years:<sup>9</sup>

201-202, 260-261, 319-321, 379-380, 438-439, 497-498

For each of these years, we inspect the longitudes of Mars and the ascending node on November 20, around the middle of the span of less than two months possible for the Sun. In a single month Mars cannot move an entire sign, while the Moon's nodes shift by less than two degrees.

Since we are not testing for very precise agreement, we have used the theories of Ptolemy's *Almagest* to test each of the listed years because of the convenience of Robert van Gent's *Almagest Ephemeris Calculator* for making such comparisons.<sup>10</sup> Only for 319 do we find a satisfactory match for both Mars and the node. Taking into account the signs occupied by Venus, Mercury, and the Moon, we can narrow the possible dates down to November 17-19.

To obtain further precision, we exploit the formulas for calculating the Lot of Fortune  $\lambda_{\text{Fortune}}$  and the Lot of Daimon  $\lambda_{\text{Daimon}}$  from the longitudes of the ascendant ( $\lambda_{\text{H}}$ ), the Sun ( $\lambda_{\odot}$ ), and the Moon ( $\lambda_{\text{C}}$ ) for a nocturnal nativity:

$$\lambda_{\text{Fortune}} = \lambda_{\text{H}} + \lambda_{\odot} - \lambda_{\text{C}}$$

$$\lambda_{\text{Daimon}} = \lambda_{\text{H}} + \lambda_{\text{C}} - \lambda_{\odot}$$

This gives us the elongation of the Moon from the Sun, ( $\lambda_{\text{C}} - \lambda_{\odot}$ ), as  $241^{\circ} 22'$ , while incidentally securing the uncertainly read numeral for the degrees of the Lot of Fortune. According to the *Almagest* theories, this elongation was attained, to the nearest equinoctial hour, on November 19 at about two equinoctial hours after midnight for the meridian of Alexandria. For this date and time, we compare data computed by the theories of the *Almagest* with the papyrus (Table 1).

	<i>Almagest</i>	<i>Papyrus</i>
Saturn	Aries $2^{\circ} 35'$	Aries
Jupiter	Virgo $3^{\circ} 3'$	Virgo $7^{\circ} 40'$
Mars	Scorpio $20^{\circ} 28'$	Scorpio $22^{\circ} 32'$
Venus	Libra $27^{\circ} 19'$	Libra $29^{\circ} 18'$
Mercury	Sagittarius $12^{\circ} 51'$	Sagittarius $13^{\circ} 53'$
Sun	Scorpio $25^{\circ} 21'$	
Moon	Cancer $26^{\circ} 34'$	Cancer
Mean Moon	Cancer $24^{\circ} 53'$	Cancer $24^{\circ} 3'$
Moon's arg. of anomaly	$179^{\circ} 24'$	
Moon's equation	$+1^{\circ} 41'$	

Table 1. Astronomical data computed from Ptolemy's *Almagest* for 319 CE, November 19, 2 equinoctial hours after midnight (meridian of Alexandria, mean time according to the Era Nabonassar) compared with data from P.Berl. 9825.

Ascending node                      Scorpio 8° 40'                      Scorpio 18° 3'

Further refinements and corrections are possible. Saturn's *dodekatemorion* is stated to be in Taurus; this could only be true for a longitude whose whole number part is 3° or 4°. The precise longitude can be determined as Aries 3° 43' from the formula for the Lot of Nemesis for a nocturnal nativity:

$$\lambda_{\text{Nemesis}} = \lambda_{\text{H}} + \lambda_{\text{h}} - \lambda_{\text{Fortune}}$$

In the case of Jupiter, the stated longitude, Virgo 7° 40', conflicts with Mercury as the terms ruler (valid in Virgo only for longitudes less than or equal to 6°) and with Jupiter as ruler of the *monomoiria* (valid for  $3^\circ + 7i < \lambda \leq 4^\circ + 7i, i = 0, 1, 2, \text{ or } 3$ ). From the formula for the Lot of Victory for a nocturnal nativity,

$$\lambda_{\text{Victory}} = \lambda_{\text{H}} + \lambda_{\text{Daimon}} - \lambda_{\text{z}}$$

we find Jupiter's longitude as Virgo 3° 40', consistent with the other astrological data derived from the longitude. The figure 7° in the papyrus must be a copying error (zeta instead of gamma).

The Moon's *dodekatemorion* fell in Gemini, so that the whole number part of its longitude was either 26° or 27°. Even at the beginning of this range this would imply an equation greater than +1° 57' where the *Almagest* gives +1° 41', so we may assume that the longitude was not much greater than Cancer 26°.

The data provided for the preceding full Moon provide us with another check on the solar and lunar longitudes. According to the papyrus, the exact opposition took place on Hathyr 17 (November 14) at the 7th seasonal hour—undoubtedly of day, though the indication of this is illegible—with the Sun at Scorpio 20° 30' and the Moon at Taurus 20° 30'. Since the nativity was roughly four and a half days later, the Sun's longitude at the nativity should have been within a few minutes of Scorpio 25° 0', and (adding the known elongation) the Moon's should have been within a few minutes of Cancer 26° 22'.

With an approximate value for the Sun's longitude, we can use the ascendant to get a more accurate estimate of the time of the nativity as well as the terrestrial latitude for which the horoscope was computed, on the hypotheses that the time was a whole number of seasonal hours past sunset and that trigonometrical tables comparable to Ptolemy's were used to determine the cardines. For a chosen latitude, we find the oblique ascensions of the ascendant ( $Q_{\text{H}}$ ) and of the point diametrically opposite the Sun ( $Q_{180^\circ-\odot}$ ) as well as the number of degrees of ascension corresponding to one seasonal hour of night ( $\chi$ ). The ascensional difference divided by  $\chi$  gives the number of seasonal hours past midnight corresponding to the ascendant for the chosen latitude; if it is close to an integer, this is likely to be the correct latitude.

Latitude	$Q_{\text{H}}$	$Q_{180^\circ-\odot}$	$Q_{\text{H}} - Q_{180^\circ-\odot}$	$\chi$	Hours
Meroe (16° 27')	160° 13'	46° 39'	113° 34'	15° 59'	7.11
Syene (23° 51')	159° 5'	43° 42'	115° 23'	16° 29'	7
Lower Egypt (30° 22')	158° 0'	40° 45'	117° 15'	16° 58'	6.91

Table 2. Time in seasonal hours corresponding to the known longitudes of the ascendant and Sun for principal latitudes of Ptolemy's geographical system.

From the oblique ascension tables of the *Handy Tables* we find the data given in Table 2.<sup>11</sup> The circumstance that the calculations for the latitude of Syene lead to *exactly* 7 seasonal hours strongly suggests that we have reconstructed the basis on which the ascendant was computed. This result implies (1) that the assumed time and place of the nativity were 319 November 19, end of the 7th hour of night, on the parallel through Syene, (2) that the ascension tables were essentially the same as those of the *Handy Tables*, and (3) that the longitude of the Sun was assumed to be exactly Scorpio 25° 0', either because this was the actual longitude calculated for the date or because the longitude was close enough to a whole number that the computer did not bother to interpolate in the table but merely read of the tabulated value for the nearest whole degree. (If we take the Sun's stated longitude at the preceding full Moon and add the

Sun's progress between that moment and that of the nativity according to the *Almagest*, we get approximately Scorpio 25° 8'.)

According to the table of right ascensions of the *Handy Tables*, the midheaven corresponding to  $Q_H = 159^\circ 5'$  is Gemini 10° 44'. Unfortunately all that one can be sure of from the papyrus is that the whole number part of the midheaven's longitude was 10° or greater, and that the number of minutes had two digits.

Table 3 lists the positions of the planets, nodes, preceding full moon and cardines with the restorations and corrections for technical data discussed above; for a diagrammatic representation see Fig. 6.

	Longitude Papyrus	Longitude Restored/Emended	House	Terms	Triplicity	Exaltation/Depression	Monomoiria	Dodekatemorion
Sun	[missing]	[near Scorpio 25° 0']	[Mars]	[Saturn]	[Mars]	[Depression Moon]	[Mercury]	[Virgo]
Moon	[missing]	[near Cancer 26° 22']	[Moon]	[Saturn]	Venus	[Ex. Jupiter] Dep. Mars	Venus	Gemini
Saturn	[missing]	[Aries 3° 43']	Mars	[Jupiter]	Jupiter	Ex. Sun, Dep. Saturn	[Mercury]	Taurus
Jupiter	Virgo 7° 40'(!)	Virgo [3°] 40'	Mercury	[Mercury]	Saturn(!) [Moon]	Ex. Mercury Dep. Venus	Jupiter	[Libra]
Mars	Scorpio 22° 32'		Mars	Jupiter	Venus(!) [Mars]	Depression Moon	Sun	[Leo]
Venus	Libra 29° 18'		Venus	Saturn(!) [Mars]	Mercury	Ex. Saturn Dep. Sun	Mercury	Libra
Mercury	Sagittarius 13° 53'		Jupiter	Venus	Jupiter		Mars(!) [Saturn]	Taurus
Ascending Node	Scorpio 9° 40'		Mars	Venus	Venus(!) [Mars]	Depression Moon	Venus	Aquarius
Descending Node	Taurus 9° 40'		Venus	Mercury	Venus(!) [Moon]	Exaltation Moon	Moon	Leo
Preceding full moon	Taurus 20° 30'		Venus	Jupiter	Moon	not given	Sun	Capricorn
Ascendant	Virgo 10° 57'		Mercury	Venus	not given	not given	not given	not given
Midheaven	Gemini 10° [nn']		Mercury	Jupiter	not given	not given	not given	not given
Setting	Pisces nn° 5[n']	Pisces [10°] 5[7']	[Jupiter]	Venus	not given	not given	not given	not given
Lower Midheaven	Sagittarius	Sagittarius 10° [nn']	Jupiter	Jupiter	not given	not given	not given	not given

Table 3. Summary of the data of the horoscope. [ ] = restoration/emendation; (!) = error.

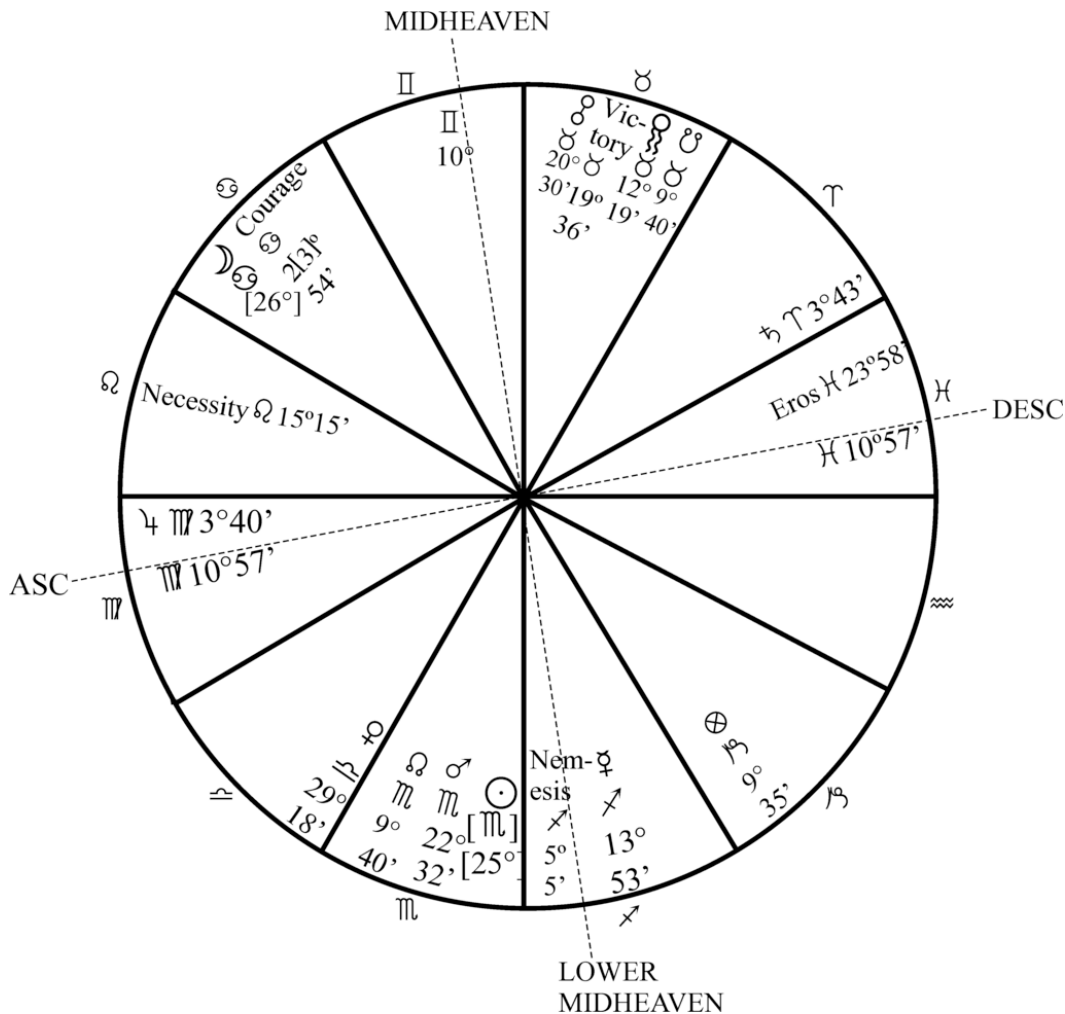


Fig. 6. Diagrammatic representation of the horoscope.

**Part II: Astronomical commentary.**

For purposes of comparison with modern theory, we assume (disregarding the effect of the equation of time) that times according to our horoscope as well as according to the *Almagest* theories are two equinoctial hours later than UT. The time of the nativity derived above is approximately 1.1 equinoctial hours past midnight, and the horoscope’s time for the preceding full Moon is approximately 0.9 equinoctial hours past noon. The longitudinal data present in the papyrus or securely restored are compared below with computations for the same dates and times according to the *Almagest* and according to the modern theory.<sup>12</sup> The errors with respect to the JPL figures are in parentheses.

	<i>papyrus</i>	<i>Almagest</i>	<i>Modern</i>
<i>319 November 14, 0.9 equinoctial hours after noon</i>			
Sun	230° 30' (-1° 56')	230° 41' (-1° 45')	232° 26'
Moon	50° 30' (-2° 2')	50° 30' (-2° 2')	52° 32'
<i>319 November 19, 1.1 equinoctial hours after midnight</i>			
Saturn	3° 43' (-1° 13')	2° 35' (-2° 21')	4° 56'

Table 4. Comparison of papyrus horoscope with data from Ptolemy’s *Almagest* and modern theory (JPL Horizons ephemeris).

Jupiter	153° 40' (-0° 31')	153° 2' (-1° 9')	154° 11'
Mars	232° 32' (+0° 20')	230° 27' (-1° 45')	232° 12'
Venus	209° 18' (-0° 34')	207° 16' (-2° 36')	209° 52'
Mercury	253° 53' (-0° 7')	252° 48' (-1° 12')	254° 0'
Moon elongation	241° 22' (+0° 27')	240° 42' (-0° 13')	240° 55'
Moon mean long.	114° 3' (-2° 10')	114° 24' (-1° 49')	116° 13'
Moon ascending node	219° 40' (-1° 3')	218° 40' (-2° 3')	220° 43'

It is immediately obvious that the longitudes in the papyrus were not obtained from Ptolemy's tables, but from some other source of roughly equivalent accuracy. Considering only the five planets, the mean error for the papyrus is  $-25'$ , with a standard deviation of  $35'$ ; the *Almagest* mean error is  $-1^\circ 49'$ , with standard deviation  $39'$ . The mean error of Ptolemy's longitudes is largely due to his defective tropical frame of reference, which is about a degree off for his own time and by the date of the horoscope about a degree and a half off.<sup>13</sup> If, as we incline to believe, the longitudes of the horoscope are to be understood as tropical, the planetary tables on which it was based seem to have reflected little error in the frame of reference. On the other hand, the tables for the Sun and Moon appear to have had similar systematic errors to Ptolemy's. Perhaps the composer of the horoscope used tables from different sources for the luminaries and for the planets.

An alternative possibility worth exploring is that the longitudes in the horoscope are in a sidereal frame of reference. Abundant evidence exists that when Ptolemy's tables were used for astrological purposes during the third and fourth centuries, the tropical longitudes obtained from the tables were generally converted to sidereal by adding  $8^\circ$  minus one-eightieth of a degree for every year since 158 BCE, a formula explicitly reported by Theon of Alexandria as employed by the "astrologers of old."<sup>14</sup> For the nativity date, the value of this correction would have been approximately  $+2^\circ 3'$ , an amount that would more or less cancel out the error of Ptolemy's tropical frame of reference. It is conceivable, therefore, that the planetary longitudes in the papyrus look like tropical longitudes in an accurate tropical frame of reference because they are actually sidereal longitudes in a frame of reference that by chance nearly coincided with the true tropical frame of reference in the early fourth century. This hypothesis fails, however, to explain why the longitudes for the Sun and Moon appear to fit Ptolemy's inaccurate tropical frame of reference, and moreover our reconstructed computation of the ascendant assumes that the solar longitude was understood as tropical.

The synchronization of the longitudinal theories of the Sun and Moon is crucial for obtaining accurate times of 94 syzygy. According to the JPL ephemeris, the exact opposition on November 14 occurred less than 20 minutes before the time given in the papyrus, which of course is expressed just as a whole number of seasonal hours; the *Almagest* theories predict exact opposition about 20 minutes later than the papyrus.

A puzzling item in the horoscope is the longitude given for the "latitude ( $\pi\lambda\acute{\alpha}\tau\omicron\varsigma$ ) of the Moon," Capricorn  $18^\circ 3'$ . Obviously this is not a latitude at all, nor does it have any recognizable relation to the Moon's argument of latitude ( $167^\circ 20'$  from the northern limit according to the *Almagest*) or the nodes. We suspect that it represents the longitude of the apogee in an eccentric lunar model. Modern theory puts the lunar apogee at Capricorn  $27^\circ 41'$ , while according to the mean motions of the *Almagest*, this point (which has no direct role in Ptolemy's epicyclic model) would have been at Capricorn  $25^\circ 29'$  (error  $-2^\circ 12'$ ). Hence if our identification is correct, the error in the apogee ( $-9^\circ 38'$ ) and the resulting phase error in lunar anomaly of the tables used for the horoscope were considerably greater than Ptolemy's. The incorrect designation of this position as the latitude could have resulted from eyeskip in copying a list of data relating to the Moon.

We pointed out previously that if the solar tables used for the horoscope gave the same increase in the

Sun's longitude as the *Almagest* over the interval between the preceding full Moon and the nativity, the Sun's longitude at the nativity should have been about Scorpio 25° 8', and hence, adding the elongation 241° 22', the Moon's longitude should have been about Cancer 26° 30'. Subtracting the Moon's mean longitude, Cancer 24° 3', we find the Moon's equation to be about +2° 27'.

Now suppose that the lunar tables used by the horoscope's composer assumed a simple eccentric model, the eccentric counterpart of the preliminary epicyclic model of *Almagest* Book 4. Entering the Moon's argument of anomaly (i.e. the mean Moon minus the apogee), 186° 0', in the table of equations in Book 4 chapter 10, we find an equation of merely +35'. Obviously a simple model, even with a much larger eccentricity, could not have produced an equation of about two and a half degrees.

The final lunar model of *Almagest* Book 5, which accounts for the Moon's second anomaly by introducing a rapidly revolving eccentric bearing the epicycle, yields an equation of +1° 36' because Ptolemy's special definition of the apogee of the lunar epicycle introduces an adjustment (commonly called the *prosneusis* in modern discussions) to the argument of anomaly. This correction is dependent on the mean elongation of the Moon from the Sun. The equation, in turn, is dependent on this corrected argument of anomaly and on the mean elongation.

Suppose now that the tables used for the horoscope assumed a model that was functionally similar to Ptolemy's final model. We may assume that the mean elongation would have been very nearly the same as obtained from the *Almagest* theory, 238° 37', but, because of the greater phase error, the mean anomaly was 186° 0' instead of 178° 52'. The so-called *prosneusis* correction, +13° 9', is unchanged, so the corrected argument is 199° 9', and the equation is +2° 32'. Since this is quite close to the value we are looking for, it would appear that our conjecture is correct that the longitude Capricorn 18° 3' in the horoscope refers to the apogee in lunar model in which an eccentric accounted for the first anomaly, and moreover this model also incorporated a correction for the second anomaly in a way not dissimilar from Ptolemy's final model.

The middle register for the Moon and each of the planets contains a statement about the body's position and motion in latitude. It comprises three parts:

- A location statement "in the ascent/descent of the south/north" (ἐπὶ τῆς τοῦ νοτίου/βορείου ἀναβάσεως/καταβάσεως). This is probably according to a division of the ecliptic into four quadrants delimited by nodes and northern and southern limits, so that the variables were determined purely by the body's longitude and the location of the nodes.
- The latitude expressed in degrees and minutes in a stated direction south or north (ὡς πρὸς τὰς μεσημβρίας/ἄρκτους) of the ecliptic. This would have been computed using tables based on a latitudinal model.
- A qualitative statement about the latitude in the form "ascending/descending the south/north" (ἀναβαίνων/καταβαίνων τὰ νότια/βόρεια) or simply "ascending/descending." The trend was likely also determined from the latitudinal model, e.g. by comparing latitudes computed for consecutive days, while the direction, when given, simply repeats information from the second part using a different vocabulary.

The Moon's descending node is given later in the papyrus as Taurus 9° 40', and, as we have seen, the Moon's own longitude was near Cancer 26° 30', so it would have been on the descending quadrant south of the ecliptic. If the maximum lunar latitude was assumed to be 5° (Ptolemy's parameter), an argument of latitude around 166° 50' would yield a latitude of -4° 52'. Only the whole number of the latitude, 4°, and the indication in the third part that the Moon is moving further south survive on the papyrus.

The latitudes and trends (represented by arrows, up meaning northward) ascribed to the planets in the horoscope are summarized below, with comparisons from Ptolemy's *Almagest* and *Handy Tables* and from modern theory.

<i>Planet</i>	<i>Papyrus</i>	<i>Almagest</i>	<i>Handy Tables</i>	<i>JPL</i>
Saturn	+1° 01' ↓	-2° 51' ↑	-2° 48' ↑	-2° 44' ↑
Jupiter	+1° 22' ↓	+1° 09' ↑	+1° 01' ↑	+1° 12' ↑
Mars	-0° 20' ↓	-0° 01' ↓	+0° 04' ↓	-0° 14' ↓
Venus	+1° 35' ↓	+1° 42' ↓	+1° 34' ↓	+1° 36' ↓
Mercury	-1° 13' ↑	-2° 01' ↑	-1° 41' ↑	-2° 17' ↑

Table 5. Latitudinal data for planets from papyrus horoscope and Ptolemy's *Almagest* compared.

Saturn was in fact near its southern limit, so that a modest shift in its assumed nodal line would explain why the papyrus has its latitude decreasing, but the indication that it was north of the ecliptic is surely a mistake rather than a reflection of a variant latitudinal model. Similarly Jupiter was close enough to its northern limit so that its computed trend would have been sensitive to the exact placement of the nodal line. In any case, it is obvious that the latitudinal models underlying the data in the papyrus were significantly different from either those of the *Almagest* or the revised models of the *Handy Tables*.<sup>15</sup>

The lowest register identifies a fixed star that “rises with” the heavenly body. These turn out to be stars in the zodiacal belt, and the principle of their selection seems to have been proximity in longitude, not in oblique ascension; in other words, the composer of the horoscope simply consulted a star catalogue, paying attention only to the stars' longitudes. As we will see, the catalogue was similar or identical to the zodiacal star list in the *Handy Tables*. The text in the horoscope (“being north/south of the star”) gives the impression that the stated number of degrees and minutes represents a difference in latitude between the star and the heavenly body, but comparison with the *Handy Tables* list shows that this quantity is simply the star's own latitude. Perhaps τοῦ ἀκτέροϋ (“of the star”) is a confused substitution for τοῦ διὰ μένων (“of the ecliptic”). βαθμός, “step,” as a quasi-unit for the stars' magnitudes (which again simply match Ptolemy's) has no parallel of which we are aware; it is unrelated to the use of βαθμός for a unit of argument of latitude (equivalent to 15°).<sup>16</sup>

The *Handy Tables* list is an adaptation from the catalogue of *Almagest* Books 7-8 but with many variants in the names assigned to the stars. Instead of absolute longitudes for a specific epoch date, the list gives each star's elongation from Regulus (obtained by subtracting Regulus's *Almagest* longitude, 122° 30', from the star's *Almagest* longitude). The stars are not grouped according to the imaginary figures of the constellations but in order of increasing elongation, which is convenient for finding which stars were closest to each heavenly body on a given date. In the absence of a critical edition of the list, we have consulted three early copies, *L* = *Leid. B.P.G.* 78 (ff. 142r-145r), *F* = *Laur. plut.* 28,26 (ff. 124v-127r), and *V* = *Vat. gr.* 1291 (ff. 90v-94v).<sup>17</sup>

For each of the planets, we give the body's elongation from Regulus (subtracting the *Handy Tables* longitude of Regulus for the nativity date, Leo 4° 19' from the body's horoscope longitude). The star's name as given in the papyrus is followed by the form or forms of the name in the three *Handy Tables* manuscripts and the *Almagest*. References in the form “XXII: 1, PK 362, Heiberg 2.84-85” indicate the constellation and star number in Toomer's translation of the *Almagest* catalogue, the number assigned by Peters and Knobel (following Bailly), and the page numbers in Heiberg's edition.<sup>18</sup> We also provide Toomer's and Graßhoff's identifications of the stars.<sup>19</sup>

Saturn. Elongation 239° 24'.

Papyrus: τῶν [ἐν τῇ κεφαλῇ τοῦ Κροῦ] γ/ ὁ ἡγοῦ[μενος]

*Handy Tables (FV)*: τῶν ἐν τῇ κεφαλῇ τοῦ Κριοῦ ᾧ ἡγούμενος

*L*: ΤΟ ΕΝ ΤΗ ΚΕΦΑΛΙ Τ(ΟΥ) ΚΡΙΟΥ Ἰ Ο Π(ΡΟ)ΗΓΟΥΜΕΝΟΣ

*Almagest* (XXII: 1, PK 362, Heiberg 2.84-85): τῶν ἐπὶ τοῦ κέρως β̄ ὁ προηγούμενος

Elongation 244° 10', latitude +7° 20', magnitude 3

Toomer: γ Ari; Graßhoff: γ<sup>2.1</sup> Ari

Despite the gaps in the papyrus, enough survives of the star's name to put its identity beyond reasonable doubt. At elongation 244° 10', it was not the closest star to Saturn in the *Handy Tables* list. The nearest star with a lower elongation is ὁ προηγούμενος τοῦ ἐπὶ τοῦ συνδέσμου τῶν β̄ λίνων ("the one in advance of the one on the node of the two fishing-lines" = XXXIII: 18, PK 691, Heiberg 2.126-127), while the nearest with a higher elongation is ὁ ἐπ' αὐτοῦ τοῦ συνδέσμου τῶν β̄ λίνων λαμπρός ("the bright one right on the node of the two fishing-lines" = XXXIII: 19, PK 692, Heiberg 2.126-127).<sup>20</sup> The star named in the papyrus comes immediately after this pair. Apparently either the list consulted by the composer of the horoscope was missing several stars that the *Handy Tables* list has in this region, or he made a mistake.

Jupiter. Elongation 29° 19'.

Papyrus: ὁ ἐπόμενος τῆς νο[τί]ας πτέρυγος τῆς [Πα]ρθένου

*Handy Tables (LFV)*: ὁ ἐπ' ἄκρας τῆς νοτίας πτέρυγος τῆς Παρθένου

*Almagest* (XXVII: 5, PK 501, Heiberg 2.102-103): ὁ ἐπ' ἄκρας τῆς νοτίου καὶ ἀριστερᾶς πτέρυγος

Elongation 26° 30', latitude +0° 10'<sup>21</sup>, magnitude 3

Toomer, Graßhoff: β Vir

ἐπόμενος ("trailing") in the papyrus was probably a misreading of ἐπ' ἄκρας ("on the tip of"). The next star in the *Handy Tables* list (but further from Jupiter at elongation 35° 45') is ὁ ἐπόμενος καὶ δεύτερος ὢν νοτιώτερος αὐτοῦ ("the trailing and second one, being south of it" = XXVII: 6, PK 502, Heiberg 2.102-103).<sup>22</sup>

Mars. Elongation 108° 13'.

Papyrus: ὁ ἐπόμενος τῶν ἐν τῷ κτήθει τοῦ Σκορπίου

*Handy Tables (V)*: ὁ ἐπόμενος τῶν ἐν τῷ κτήθει τοῦ Σκορπίου

*L*: Ο ΕΠΟΜΕΝ(Ο)C Γ Τ(ΩΝ) ΕΝ ΤΩ CΤΙΘΗ Τ(ΟΥ) CΚΟΡΠΙ(ΟΥ)

*F*: Ο ΕΠΟΜΕΝΟΣ ΤΩΝ Ἰ ΑCΤΕΡΩΝ ΤΩΝ ΕΝ ΤΩ CΤΗΘΕΙ Τ(ΟΥ) CΚ(ΟΡΠΙΟΥ)

*Almagest* (XXIX: 9, PK 554, Heiberg 2.110-111): ὁ ἐπόμενος τῶν ᾗ (*scil.* ἐν τῷ κόματι λαμπρῶν)

Elongation 102° 0', latitude +5° 30', magnitude 3

Toomer, Graßhoff: τ Sco

The papyrus agrees with *V*'s version of the name in not indicating that this is one of a set of three stars; the somewhat unstable presence of the number in *L* and *F* may reflect contamination from the *Almagest*. The next star in the *Handy Tables* list, ὁ ἐπὶ τοῦ ἐπομένου γόνατος τοῦ Ὀφιοῦχου ("the one on the trailing knee of Ophiuchus" = XIII: 12, PK 245, Heiberg 2.68-69) had a greater longitude than Mars but was much closer to the planet, at elongation 108° 40'.

Venus. Elongation 84° 59'.



Papyrus: ὁ ἐν μέσῃ τῇ νοτίῳ χήλῃ τοῦ Σκορπίου  
*Handy Tables (F)*: ὁ ἐν μέσῃ τῇ νοτίῳ χήλῃ τοῦ Σκορπίου  
*L*: Ο ΕΝ ΜΕCΩ Τ(ΗC) ΝΟ(ΤΙΑC) ΧΗΛ(ΗC) Τ(ΟΥ) CΚΟΡΠΙ(ΟΥ)  
*V*: the relevant folio is lost  
*Almagest* (XXVIII: 5, PK 533, Heiberg 2.106-107): ὁ ἐν μέσῃ τῇ νοτίῳ χήλῃ  
 Elongation 81° 30', latitude -1° 40', magnitude 4  
 Toomer: ι Lib; Graßhoff: ι<sup>1</sup> Lib

The next star in the *Handy Tables* list, ὁ ἐν μέσῃ τῇ βορείῳ χήλῃ τοῦ Σκορπίου (“the one on the middle of the northern claw of the Scorpion”), has elongation 85° 20' and thus was closer to Venus though higher in longitude.

Mercury. Elongation 129° 34'.

Papyrus: ὁ βοριότερος ἀπὸ τοῦ βοριοτάτου τῶν ἐν τῷ τόξῳ  
*Handy Tables (FV)*: ὁ δεύτερος ἀπὸ τοῦ βορειωτάτου τῶν ἐν τῷ τόξῳ  
*L*: Ο Β̄ ΑΥΤ(ΟΥ) ΒΟΡΙΩΤΑ(ΤΟΥ) Τ(ΩΝ) ΕΝ ΤΩ ΤΟΞΩ  
*Almagest* (XXX: 4, PK 573, Heiberg 2.112-113): τῶν ἐν τῷ βορείῳ μέρει τοῦ τόξου ὁ νοτιότερος  
 Elongation 126° 30', latitude -1° 30', magnitude 3  
 Toomer, Graßhoff: λ Sgr

The reading of *L* shows the origin of the papyrus's βοριότερος as a misinterpretation of the ordinal numeral beta as an abbreviation. The next star in the *Handy Tables* list, ὁ ἡγούμενος τῶν ἐν τῷ ὠμοπλάτῃ τοῦ Τοξότου (“the leading one of those on the shoulderblade of Sagittarius” = XXX: 7, PK 576, Heiberg 2.112-113), was closer to Mercury at elongation 130° 30'.

Thus with the sole exception of the star provided for Saturn, which was probably chosen in error, the star said to be “rising with” each planet is consistently the star in the *Handy Tables* list that was closest to it in the direction of lower longitude. If this was the case for the Moon (at elongation 352° 11'), the star ought to have been the following:

*Handy Tables (LF)*: τῶν ἐν τῇ κεφαλῇ τοῦ Λέοντος β̄ ὁ νοτιότερος  
*V*: the relevant folio is missing  
*Almagest* (XXVI: 4, PK 465, Heiberg 2.98-99): ὁ νοτιότερος αὐτῶν (*scil.* τῶν ἐν τῇ κεφαλῇ β̄)  
 Elongation 351° 40', latitude -9° 30', magnitude greater than 3  
 Toomer, Graßhoff: ε Leo

This reconstruction has tenuous support in the surviving numeral for the magnitude (which could have been qualified with “greater than” either before or on the next line); the preceding and following stars in the *Handy Tables* list respectively have magnitudes “less than 4” and “greater than 4.”

### Part III: Astrological Commentary

This part of our commentary consists of four sections. First, the kinds of astrological data represented in our horoscope will be given. Secondly, a tally will be made of all horoscopes in the extant corpus that include these data. Thirdly, examples of elaborate horoscopes incorporating a variety of data will be compared with our horoscope. Finally, their astrological meaning and context will be examined.

*Astrological Techniques in P.Berl. 9825*

The astrological significance of this papyrus can scarcely be overstated. It now joins other elaborate (sometimes called ‘deluxe’)<sup>23</sup> papyri in the extant corpus that apply a number of additional kinds of data (henceforth referred to as “technical data”) to the basic horoscopic positions given for the nativity (that is, the zodiacal longitudes – which may include degrees and minutes of the sign – of the planets and luminaries, the Ascendant, and sometimes the Midheaven and other cardines). The information given in the papyrus consists of the following:

- For the planets, luminaries, and lunar nodes  
(due to damage, the papyrus lacks information relating to the Sun)
  1. Zodiacal longitude
  2. Dignities<sup>24</sup> (in order of listing): house, terms, triplicity, exaltation/depression
  3. *Monomoiria*
  4. *Dodekatemorion*
  5. Latitude
  6. Co-rising (*paranatellonta*) with fixed stars
  7. Fixed star’s “step” in magnitude
- For the cardines: (Ascendant, Midheaven, Setting [Descendant], Lower Midheaven)
  1. Zodiacal longitude (degrees and minutes)
  2. Dignities: house, terms
- For the Lots: Fortune, Daimon, Eros, Necessity, Courage, Victory, Nemesis
  1. Zodiacal longitude
  2. Dignities: house, terms
- For the Moon only
  1. “Latitude” (apparently an error for longitude of apogee); its house
  2. Mean longitude; longitude’s house
- Prenatal full Moon
  1. Date of prenatal syzygy
  2. Zodiacal longitude
  3. Dignities: house, terms, triplicity
  4. *Monomoiria*
  5. *Dodekatemorion*
    - Presiding planet
    - Managing planet
    - Master of the nativity

The wealth of information provided by the horoscope is almost unparalleled in the extant corpus of original documentary and literary horoscopes. At present, there are 446 extant horoscopic texts (including our horoscope) surviving from antiquity, as catalogued by Stephan Heilen and including not only Greek (345) and Latin (8) charts but those in Akkadian (30), Demotic Egyptian (51), Coptic (1), Persian (2), Arabic (2, plus 7 unpublished) and Jewish (1).<sup>25</sup> Most of these extant horoscopes give only the luminary and planetary positions, the Ascendant, and occasionally the Midheaven, often only by sign, though many include zodiacal longitudes in degrees or degrees and minutes.<sup>26</sup> Some include a number of additional technical data (astronomical, astrological, or both) to be used in chart interpretation, in addition to basic information.

*Frequency of Additional Technical Data in Extant Horoscopes*

To see how frequently the varieties of technical data given in our horoscope are included in the corpus of extant horoscopes as a whole, we have made a tally of those specifically represented in P.Berl. 9825, namely: lots, latitudes, fixed stars, the Moon’s nodes, *monomoiriai*, *dodekatemoria*, pre-natal syzygy (new

Moon or full Moon), planets presiding/managing, and ‘house-master’ (*oikodespotes*).<sup>27</sup> Table 6 inventories horoscopes in the currently known corpus that contain technical data, concentrating on those in Greek dated up to the end of late antiquity,<sup>28</sup> but excludes our present horoscope in the tally.

Technical Datum	Number	Language other than Greek	No. of Type		Date Range	
			Documentary	Literary	Documentary	Literary
Lots <sup>29</sup>	95	1 Demotic	26	69	81–5 <sup>th</sup> c.	43 BCE–621 CE
Prenatal Syzygy	23		1(?) <sup>30</sup>	22	338	40–497
Moon’s Nodes	18		—	18	—	72 BCE–497 CE
‘Master’/ ‘House-master’ ( <i>oikodespotes</i> ) <sup>31</sup>	14		6	8	15/22–late 4 <sup>th</sup> /early 5 <sup>th</sup> c.	40–487
<i>Dodekatemoria</i>	7		4	3	46–late 2 <sup>nd</sup> / early 3 <sup>rd</sup> c.	479–487
Fixed Stars	7		2	5	81–137	76–497
Latitudes	5		4	1	46–late 2 <sup>nd</sup> / early 3 <sup>rd</sup> c.	497
Presiding and Managing Planets	4		—	4	—	475–497
<i>Monomoiriai</i>	3		2	1	late 2 <sup>nd</sup> / early 3 <sup>rd</sup> –late 3 <sup>rd</sup> / early 4 <sup>th</sup> c.	497

Table 6. Technical Data in Ancient Horoscopes in Order of Frequency.

As the above list shows, lots are the most frequent addition to a horoscope (95). The second most frequent category is the prenatal syzygy, with 23, followed by the Moon’s nodes (18) and the *oikodespotes* (14). A very few include fixed stars (7), *dodekatemoria* (7), latitudes (5) or steps (4), presiding and managing planets (4) or *monomoiriai* (3). We should point out that of the extant horoscopes including additional technical data, most do not include large quantities of them, but concentrate on a few as needed for a specific interpretation. This makes our horoscope even more rare. To illustrate its exceptionality, we shall now look at the commonalities and differences between this and four other elaborate horoscopes of comparable length and content.

#### *Elaborate Horoscopes: Examples and Comparisons*

Only a small number of elaborate horoscopes approach the detail of ours. For a comparison, we shall look at four elaborate horoscopes, pertaining to nativities from the first through the fifth centuries CE (and thus probably composed from the late first through the sixth centuries), that contain at least five types of technical data in addition to the basic longitudes of planets, luminaries and cardines/angles. These include three original horoscopes on papyri and one preserved through the medieval manuscript tradition in multiple copies.

#### *P.Lond. 1.130 (Hor. gr. 81.III.31 = GH 81)*

This papyrus horoscope is dated to March 31, 81 CE, so was likely calculated in the late first to early second century CE.<sup>32</sup> It consists of nine columns and 213 lines, and is completely preserved. Unusually for an original documentary chart, its author, Titus Pitenius, identifies himself in a kind of colophon. It includes the following technical data also occurring in our horoscope: dignities (house, terms, triplicity, exaltation, decan), *dodekatemoria*, fixed stars, Lot of Fortune, *oikodespotes*. In addition, it contains information on decans in their Egyptian names, the gender and quadruplicity (tropical, solid, double-bodied) of a planet’s or luminary’s sign, planetary phases in relation to the sun,<sup>33</sup> and the number of days of the pregnancy.<sup>34</sup> It is similar to our horoscope in terms of length and in the abundance of technical data

calculated. There is an emphasis in P.Lond. 1.130 on the locations of heavenly bodies and the Midheaven in relation to fixed stars or constellations. The wording used for the calculation of the Lot of Fortune is problematic, and has been addressed by both Greenbaum and Heilen.<sup>35</sup> The calculation of the house-master (*oikodespotes*), which turns out to be Mercury, is consistent with the rules of Vettius Valens, Dorotheus and, later, Porphyry.<sup>36</sup> *Dodekatemoria* are calculated (wrongly, as Neugebauer and Van Hoesen correctly note)<sup>37</sup> only for the Sun and Moon.

*P.Lond. 1.98 (Hor. gr. 95.IV.13 = GH 95)*

This is another elaborate horoscope containing numerous technical data. Parts of the papyrus are missing or severely damaged; in particular, little remains of what was presumably its first column, comprising an introductory section followed by sections pertaining to the Sun and Moon. The horoscope proper consists of 81 lines. It is immediately followed by a text, large parts of which have been made illegible through erasure, headed “Prognostications of the 5 stars [i.e. the planets] concerning life,” and comprising 36 lines in Greek and 73 in Egyptian though written in an adaptation of the Greek alphabet (“Old Coptic”). We are not concerned here with this text, which, consisting as it does of extensive statements concerning the life of the native derived from elements of the horoscope, is unparalleled in any other known Greek horoscope on papyrus. Like our horoscope, P.Lond. 1.98 includes the dignities of house, exaltation and terms, as well as *dodekatemoria*, latitude, and *oikodespotes*. Additionally, it distinguishes between “bright horoscopes” and decans, supplying information for both.<sup>38</sup> It claims to have three “lots,” but these are more likely a reference to places in the chart (the Demotic Egyptian term *tmy.t*, “lot,” can also mean, in an astrological context, a “place,” Greek *topos*).<sup>39</sup>

*P. Oxy. astr. 4277 (Hor. gr. 150-250b)*

Dated paleographically (and hence only roughly) to the second half of the second century CE, this incomplete horoscope consists of two fragments, the first with three columns of 40, 35 and 9 lines respectively, and the second containing 5 lines. Included in what remains of the papyrus are the positions and descriptions of Mercury, the Ascendant, Descendant, Midheaven and Lower Midheaven; and the four lots Fortune, Daimon, Eros and Necessity. Horoscopes with these four lots are quite rare in the extant corpus.<sup>40</sup> Even as a fragmentary document missing all planetary positions except for Mercury, P. Oxy. astr. 4277 includes dignities (house, term, triplicity, exaltation, decan), *dodekatemoria*, *monomoiriai*, lots, steps and winds, planetary stations and descriptions of the zodiacal signs involved, such as gender and quadruplicity.

*The “Eutocius” horoscope (Hor. gr. 497.X.28 = GH L497)*

Dated October 28, 497, this horoscope is transmitted complete in two Byzantine Greek manuscripts, *Laur. Plut.* 28,34 ff. 141v-143v, and *Par. gr.* 2425 ff. 216v-219v, under the title “From the astrological writings [ἀστρολογουμένων] of Eutocius,” and abridged in a few other manuscripts without the attribution to Eutocius.<sup>41</sup> Its author is presumably Eutocius of Ascalon (fl. early sixth century CE), the author of extant commentaries on mathematical works of Archimedes and editor of a recension (with commentaries) of Books 1-4 of Apollonius’s *Conics*.<sup>42</sup> The introductory passage indicates that the horoscope is offered as an example of how “the computation of a chart” should be set out; in other words, it is a didactic model that, unlike most horoscopes provided in ancient astrological treatises, is meant to illustrate not techniques of astrological prognostication but rather the format appropriate for an elaborate horoscope.<sup>43</sup> It is in fact one of the most elaborate horoscopes we have.

The technical data which match those in our horoscope are: dignities (house, terms [Ptolemaic and Egyptian], triplicity [all rulers<sup>44</sup>], exaltation/depression), *monomoiria*, fixed stars near the planets (with step, magnitude, longitude and latitude), the Lots of Fortune and Daimon, lunar nodes and prenatal syzygy.

The planets are also described by their step, magnitude, longitude and latitude. In addition to these, the chart also supplies the planetary decan and face, and planetary phase of appearance in relation to the Sun.

Table 7 provides an easy-to-see comparison between the technical data of our horoscope and those with which it has been compared in the previous paragraphs.

Types of technical data:	P. Berl. 9825	P. Oxy. astr. 4277	P. Lond. 1.130	P. Lond. 1.98	Eutocius
<b>Dignities: house term</b>	X	X	X	X	X
<b>triplicity</b>	X	X	X		X
<b>exaltation/depression</b>	X	X	X	X	X
<b>Latitude</b>	X			X (but missing)	X
<b>Step &amp; direction</b>	X	X		X (but missing)	X
<b>Magnitude</b>	X		X		X
<b>Monomoiria</b>	X	X			X
<b>Dodekatemorion</b>	X	X	X	X	
<b>Fixed stars (paranatellonta)</b>	X		X		X
<b>Lots</b>	Fortune, Daimon, Eros, Necessity, Courage, Victory, Nemesis	Fortune, Daimon, [Eros], Necessity	Fortune (?)	? (Items called 'lots' are probably not) <sup>45</sup>	Fortune, Daimon
<b>Lunar Nodes</b>	X				X
<b>Master/House-master</b>	X		X	X	
<b>Presiding and Managing</b>	X				
<b>Prenatal Syzygy</b>	X				X
Dignities: decan face		X	X	X	X
Phase in rel. to Sun			X		X
Planetary stations		X	X		
Gender of planet's sign		X	X		
Quadruplicity		X	X		
"Bright Horoscopes"				X	

Table 7. Technical Data in P.Berl. 9825 Compared to Other Elaborate Horoscopes.

Key:

**Bold** = data used in P.Berl. 9825

Regular = data used in other elaborate horoscopes but not in P.Berl. 9825

#### *An Analysis of the Technical Data Used in P.Berl. 9825*

We now explore some of the technical data presented in the papyrus in their astrological meaning and context. This exposition will provide possible rationales for including them in the calculation of a horoscope. The data to be discussed are:

- Dignities
- *Monomoiria*
- *Dodekatemoria*
- Presiding and Managing
- Length of life
  - Pre-natal syzygy
  - Master of the nativity
- Lots

Astrological manuals of the Greco-Roman period and Late Antiquity may supply both methods and reasons for the technical data used by practicing astrologers. Often, they are not used in a vacuum, but can be intertwined with one another to produce an interpretation for specific concerns a client might have, such as happiness, fortune and length of life. For our particular horoscope, doctrines outlined by Paulus Alexandrinus, a fourth-century CE astrologer practicing in Alexandria, frequently coincide with those used in our horoscope. A number of them are given a thorough treatment in Paulus's *Introduction to Astrology*, produced in 378 CE. The works of other astrologers will also be consulted in elucidating the reasons for using specific techniques.

For astrologers, horoscope interpretation necessarily involves a number of factors to be synthesized and applied. The *Compendium* of Rhetorius (fl. probably 6<sup>th</sup> century CE)<sup>46</sup> provides instructions for applying these. It includes seven considerations for the astrological interpretation of a birthchart, especially in delineating the circumstances at birth, the parents, and fortunate or unfortunate life circumstances. Technical data to be considered include dignities (especially triplicity/trigon lords), the latitude of the Moon's winds, the position of the new or full moon prior to birth, lots (especially the Lots of Fortune, Daimon, Basis and Exaltation), and the ascending and descending nodes of the Moon. Another text, attributed by Franz Cumont to a Byzantine compiler who excerpted Rhetorius (*Par. gr.* 2506, fol. 73 and *Ven.* 7, fol. 170, in *CCAG* 8.1: 243-244) tells us to examine "the decans or faces...the *monomoiriai*, the bright degrees, the *dodekatemoria*, and the latitudes of the winds and the steps; the phases, stations and the co-risings of the fixed stars nearest by degree to them..."<sup>47</sup> The same document also recommends looking at the pre-natal conjunction or opposition of Sun and Moon (i.e. new or full Moon). Thus, as outlined by Rhetorius, our papyrus gives data for performing a very complete horoscope analysis.

### *Dignities*

Dignities are frequently added to extant horoscopes, as well as mentioned in astrological manuals. A definition of each type of dignity used in our horoscope can be found above in the astronomical commentary. Dignities are important in interpretation because they allow assessment of the quality and power of the planet involved. They also allow the astrologer to assess the interaction between planets based on their rulerships and rulers.

Each kind of dignity can provide more nuance in evaluation. For example, the term ruler of a luminary was often used as a factor in length of life. But the various rulers – house, exaltation, triplicity, term and decan – could also be used to find an overall chart ruler, or the ruler of a specific topic.<sup>48</sup> This discussion will briefly give some of the reasons that dignities are used in astrological interpretation, accompanied by the details of our horoscope.

1. *House rulership*. This is the most commonly reported dignity, and often mentioned in chart interpretation. The house ruler is essential to the construction of the "*thema mundi*," a symbolic chart for the birthday of the cosmos,<sup>49</sup> where each planet falls in one its zodiacal houses. The nativity of any person can be compared to the *thema mundi* as an example of an "ideal" chart.<sup>50</sup> In our horoscope, the house ruler is missing for the Sun (as all details are) and Moon. All other house rulers are correct.

2. *Term rulership*. In systems of finding rulers for length of life, the term ruler of a "predominating"

planet can become the primary indicator of longevity. In our horoscope all the term rulers are correct except for Venus, which (using the Egyptian system) should be in the terms of Mars, not Saturn.

3. *Triplicity rulership*. The triplicity lords, especially of the sect luminaries (i.e., the Sun for a day chart and the Moon for a night chart), are used for different purposes, including assessments for eminence (Valens, *Anthology* II, 2 and 22 [Pingree 1986]) and for gaining happiness, fortune or property (Dorotheus, *Carmen Astrologicum* I, 24-26 and Valens II, 2).

In our horoscope, triplicity rulers are given for eight positions including the lunar nodes (Sun is missing). For four planets these are correct: Moon, Saturn, Venus and Mercury; incorrect are the triplicity rulers for Jupiter, Mars and both lunar nodes. The errors show a tendency on the part of the chart's composer to list the diurnal triplicity rulers for earth and water instead of the nocturnal rulers.

4. *Exaltation and Depression*. The effect of exaltation is similar to that of house. A planet in its exaltation is fortified for effective action, and can aid planets located in its sign of exaltation. Conversely, a planet in the sign of its depression is weak and ineffective, or even harmful.

In our horoscope the exaltations are given for four positions: Saturn, Jupiter, Venus and the descending node (the Moon's is missing, and no planets are exalted in the signs of Scorpio and Sagittarius, where Mars, Mercury and the ascending node are located). Depressions are given for Moon, Saturn, Jupiter, Mars and the ascending node (there is no exaltation or depression in Sagittarius, where Mercury lies, and in Taurus, where the descending node lies). All exaltations and depressions are accurate.

#### *Monomoiriai*

Our horoscope includes data on *monomoiriai* by sign. Chapter 5 of Paulus's *Introduction* explains this doctrine (another form, by trigon/triplicity, is discussed in Chapter 32). This process is dependent on the house-ruler of the sign, and the so-called Chaldean order of the planets (Saturn, Jupiter, Mars, Sun, Venus, Mercury, Moon). To find the planetary ruler of the *monomoiria* (which means 'single degree') of a sign's degree, one starts with the house ruler of that sign, which rules its first degree. Thus, for Aries and Scorpio, Mars is the ruler of the first degree. The process continues with the planets in Chaldean order through the rest of the degrees of Aries and Scorpio – the second degree's ruler is the Sun, the third degree's Venus, and so on. For the Venus-ruled signs of Taurus and Libra, one begins with Venus for the first degree's ruler, Mercury for the second degree, Moon for the third degree, Saturn for the fourth degree, and so on. Paulus provides a table at the end of Chapter 5. A scholion for this chapter<sup>51</sup> states that *monomoiriai* can connect (by "sympathy") two planets otherwise unrelated to each other, since it assigns degrees based on planets ruling signs that may not make a conventional aspect, such as Aries and Scorpio (both ruled by Mars).

Valens mentions *monomoiriai* in his *Anthology*, IV, 26 (Pingree 1986), which seem to operate under the same set of rules that Paulus gives for the *monomoiria* by sign. *Monomoiriai* are also mentioned in Ch. XXXV of the *Liber Hermetis*<sup>52</sup> but these seem to be the *monomoiriai* by triplicity (also covered in Paulus, Ch. 32). In original documentary horoscopes, the calculation of the *monomoiria* is rare. We find it calculated for the Midheaven, Lower midheaven, Lot of Fortune and Lot of Daimon in one "deluxe horoscope," P.Oxy. astr. 4277 (Hor. gr. 150-250b).<sup>53</sup> In the Eutocius horoscope *monomoiriai* are calculated for all five planets and the two luminaries, the prenatal full Moon, the Ascendant, Midheaven, Lot of Fortune and Lot of Daimon. In our horoscope, the *monomoiriai* are all correct except for that of Mercury.

#### *Dodekatemoria*

*Dodekatemoria* means, simply, 'twelfth-part'. It can be used to refer to any twelfth-part of something – a twelfth-part of the 360° circle, i.e. one zodiacal sign; a twelfth-part of a sign of 30°, i.e. 2 ½°; or any portion of 12 degrees. The concept originates with the Babylonians.<sup>54</sup> Paulus discusses the doctrine of *dodekatemoria* in Chapter 22. The doctrine is known in other authors, such as Julius Firmicus Maternus

(*Mathesis* II, 13.2-3), but Firmicus multiplies the degrees of the sign by 12 and adds that sum to  $0^\circ$  of the sign to produce the *dodekatemorion*, while Paulus multiplies by 13, which effectively takes into account the actual degree of the sign in question. The Babylonian system, as Rochberg demonstrates, matches what Paulus does: “Given a position in the zodiac (longitude [ $l_1$ ] expressed in degrees ( $n$ ) of a zodiacal sign ( $z$ ), a second position in the zodiac ( $l_2$ ) [i.e. the *dodekatemorion*] may be obtained by multiplying the degrees  $n$  by 12 and adding the result to the first longitude [ $l_1 = n^\circ$  of  $z$ ]:  $l_2 = 12n + n^\circ$  of  $z$ .”<sup>55</sup> As an example, Paulus gives Aries  $11^\circ$ . He multiplies the degrees by 13, yielding  $143^\circ$ . He adds that sum to the beginning of Aries:  $143^\circ + 0^\circ$  [Aries  $0^\circ$ ] =  $143^\circ$  = Leo  $23^\circ$ . (Effectively  $12n + n + z = 13n + z$ .)

Olympiodorus (Ch. 20; Boer 1962: 41.12-20) uses the example of an Ascendant at Scorpio  $20^\circ$ . Multiplying  $20^\circ$  by 13 =  $260^\circ$ . Add that to the beginning of Scorpio, i.e.  $210^\circ$ :  $260^\circ + 210^\circ = 470^\circ$ .  $470 - 360 = 110^\circ$ , or Cancer  $20^\circ$ . (Olympiodorus explains this differently, but effectively this is what he is doing.)

The calculation of *dodekatemoria* is rare in original documentary horoscopes, as we saw above.<sup>56</sup>

In our horoscope only the sign of the *dodekatemorion* is given, not the degrees. The *dodekatemoria* for the Moon, Saturn, Jupiter (for the corrected position of Virgo  $3^\circ 40'$ , not Virgo  $7^\circ 40'$ ), Mars and Venus match what the Paulus formula would produce. However, the positions of Mercury, both lunar nodes and the prenatal full Moon’s *dodekatemoria* do not match what Paulus’s formula would produce (they do match the Firmicus formula which also fits for Saturn, Jupiter [corrected position] and Mars). Two possibilities could explain this result. First, the birthchart’s constructor did use the Paulus formula, but neglected to calculate the minutes of each position, at least for Mercury, the nodes and the prenatal full moon (the *dodekatemorion* for Mercury is Gemini  $0^\circ 29'$ , almost in Taurus where the text says it is). Since no degrees are given for the *dodekatemoria*, only signs, this could have been a further truncation of the entire procedure. Or, the chart’s constructor could have been using the Firmicus formula, but miscalculated for the Moon and Venus.

Paulus tells us that this procedure is important for obtaining information about whether someone will be ‘fortunate, long-lived and blessed’ (Ch. 22, Boer 1958: 46.15-16) or make them ‘laborers, ... unable to acquire property and cursed’ (Ch. 22, Boer 1958: 46.21-22); such people will also have short lives, violent deaths, illnesses and injuries (Ch. 22, Boer 1958: 46.23). If the *dodekatemorion* of a benefic falls in the sign of the natal Sun, Moon, Mercury, cardines, Lots of Fortune, Daimon or Necessity, or on the prenatal lunation, this is said to be fortunate, but when a malefic’s *dodekatemorion* falls there, the effects are unfortunate.

### *Presiding and Managing*

Few authors except for Paulus mention the concept of presiding and managing. The earliest appears to be Serapion, in a text on *katarchai*.<sup>57</sup> Antiochus of Athens<sup>58</sup> gives outcomes for those born when certain hour rulers manage during a day, usually based on whether the planetary ruler is a benefic or malefic. Another text, by “Zenarion” (about whom nothing further is known) also uses the technique in *katarchic* charts.<sup>59</sup>

In Chapter 21, “On the Star Presiding and the One Managing” Paulus outlines the technique and promotes its use both in nativities and *katarchai*. He further approves its use in decumbitures, a chart cast for when an ill person takes to his or her bed. Paulus’s method depends, first, on finding the god ruling over the day in question (Ch. 20, ‘On Knowing to which of the Gods Each Day Belongs’). This is the god traditionally assigned to each day of the week. Thus, if the day in question is a Sunday, the Sun is the god of the day. Once the god (i.e. planet) of the day is known, that planet presides over the entire 24-hour day, which is sectioned into 12 day and 12 night hours.<sup>60</sup> The presiding planet rules the 1<sup>st</sup>, 8<sup>th</sup>, 15<sup>th</sup> and 22<sup>nd</sup> hours of that day. The hour rulers are assigned in the so-called Chaldean order from the presiding planet,



and become the ‘managers’ of that hour, beginning with the first hour of the day. Olympiodorus, Paulus’s commentator, covers the same material (Ch. 18). As an example, the well-known katarthic horoscope for the crowning of Leontius at Antioch (Hor. gr. 484.VII.18 = GH L484), lists Mercury as πολεύων and διέπων, and uses this as the reason the chart was not successful: “but they [the astrologers] did not pay attention, first, that the presiding and managing [planet], Mercury, had fallen into misfortune (εἰς πάθος). For it was at its greatest [distance] from the Sun, which brings about violent death, and it was aspected only by Saturn.”<sup>61</sup>

Only three other extant horoscopes include this technique: all are from literary sources, with dates in the fifth century CE (Hor. gr. 475.VII.16 = GH L475, Hor. gr. 479.VII.14 = GH L479, and 487.IX.5 = GH L487, the last of which mentions only the managing ruler).

In our horoscope, the planets presiding and managing are listed as Jupiter and Saturn. These would be correct if this was a diurnal chart for the 7th hour of the day of 319 CE, November 19, but this horoscope is nocturnal and belongs to the night preceding the day of November 19.<sup>62</sup> In the system outlined by Paulus, and also mentioned by Vettius Valens, an anonymous Christian writer on the hours of the day of the week, and Cassius Dio,<sup>63</sup> the 24-hour day begins at sunrise with the planetary day hours. This is the usual epoch for this system, probably arising from the fact that the Hellenistic Egyptians began the day at sunrise. But other epochs were also in use, in which the 24-hour day could begin at sunset.<sup>64</sup> Neugebauer and Van Hoesen mention horoscopes in the fourth century that use an evening epoch, and a calendar of 354 CE does as well.<sup>65</sup>

So it seems that the author of our horoscope was using an evening epoch with the Alexandrian calendar, where the day begins at sunset, and begins it by applying the usual rulers of the day hours to this evening epoch. Even though it was still Wednesday, November 18, in a day epoch (where the presiding planet would be Mercury and the managing planet, Mars, rules the 7<sup>th</sup> hour), in an evening epoch the presiding planet would be Jupiter (the presiding planet for Thursday November 19, 319), and the planet managing the 7<sup>th</sup> hour is Saturn. Because the beginning of the text is lost, we cannot know for certain how the author dated it. But this explanation seems plausible based on our knowledge of the use of epochs in this timeframe. Though it does contradict the common practice of planetary days and hours outlined by Paulus, the author was not necessarily incorrect in using the day rulers for an evening epoch, even if he was unorthodox.

#### *Length of Life: Master of the Nativity and the Prenatal Syzygy*

Although we have no way of knowing how the author of our chart planned to use the calculated information, discovering length of life is an important consideration addressed by ancient astrologers. Aside from the use of term rulers, two of the techniques used to determine this are included in our chart: the housemaster/master of the nativity, and the prenatal syzygy.

#### **Master of the Nativity**

This is yet another technique mentioned by Paulus in his *Introduction*. Chapter 36, “On Housemastership” (Περὶ οἰκοδεσποτείας), provides the conditions under which a planet may become the chart ruler (or, to use Paulus’s term, the κύρια τῆς γενέσεως, authority of the nativity). The Sun and Moon are most important in this process, the Sun being used in a day chart, but the Moon at night. In a nocturnal chart, as ours is, one looks at the term-ruler and house-steward (οἰκοδέκτωρ) of the Moon, and then at whether the Sun or Moon (depending on the sect of the chart) are in ‘effective’ places. At night, the effective places are the four cardines, the fifth (Good Fortune), eleventh (Good Daimon), second and eighth.

Let us apply these rules to our papyrus. In a nocturnal nativity, we look at the Moon. We know that the

Ascendant is Virgo 10° 57', and that the Moon is likely to fall between 24° (roughly its mean position) and 27° Cancer. Using the whole-sign place system, the Moon will fall in the 11<sup>th</sup> place, that of the Good Daimon, which is an effective place. The term-ruler for the Moon at 26° Cancer is still Jupiter, but in the next degree moves to Saturn in the Egyptian system. That the horoscope gives Jupiter as the 'master of the nativity' would therefore suggest a position of around 26° for the Moon (as also suggested in Part I of this commentary). The house-steward of the Moon in Cancer is, of course, the Moon. Jupiter is also in an effective place, the first (including the entire sign of Virgo as the first place). So far it seems that the Moon and Jupiter have equal claim on rulership.

Then Paulus says "when one star has more counts than the others and is found at morning rising [in a phase of visibility] on a cardine and in its own throne, this one has the rulership, especially if it oversees (κατοπτρεύω) the sect luminary."<sup>66</sup> Jupiter has no counts of rulership in the early degrees of Virgo (in fact, its depression is Virgo). It sextiles the Moon, the sect luminary, by sign (but in fact, by degree makes no aspect). (It also sextiles the other luminary, the Sun, by sign.) It is in a phase of visibility, and would appear in the eastern sky before the sun rises. It is also in a cardine, the Ascendant/first place. By contrast, the Moon is in its own house and face, which would give it two counts to Jupiter's zero. It is not on a cardine, but it is the sect luminary. This would seem to give the Moon an edge over Jupiter. Further, since both Jupiter and the Moon are in effective places, and Paulus says that if a luminary is in an effective place it becomes the ruler, it would seem that the Moon should have been chosen. However, it may be that the astrologer has (incorrectly) moved to Paulus's next condition: examining the term-ruler, triplicity lord or house-steward of the prenatal Full Moon (for a nocturnal birth).

#### **The Prenatal Syzygy**

The preceding full Moon took place at Taurus 20° 30'. This is the house of Venus, the term of Jupiter and the triplicity of the Moon. This position falls, however, in the ninth place, not usually considered an effective place (although it is a "good decline" and the place of the Sun god).<sup>67</sup> If the prenatal full Moon is not in an effective place, Paulus says, one must look at the triplicity, house and term rulers of the Lots of Fortune or Daimon; and also the lord of the Ascendant.

The Lot of Fortune falls in the 10<sup>th</sup> degree of Capricorn: triplicity of the Moon, house of Saturn and term of Jupiter. The Lot of Daimon falls in the 13<sup>th</sup> degree of Taurus: triplicity of the Moon, house of Venus, term of Mercury. The lord of the Ascendant is Mercury. We know that the Moon and Jupiter are in effective places; Saturn is in the eighth (effective), Venus in the second (also effective) and Mercury in the fourth (effective). 'And if the one ruling these places is found being aspected in the aforementioned places with that one which it has received, it will be taken as the authority of the nativity.'<sup>68</sup> In our chart, the Moon opposes Fortune by sign, Saturn squares it and Jupiter trines it. The Moon sextiles Daimon by sign, makes no aspect to Venus (but both are in Venus-ruled signs) and no aspect to Mercury. Mercury squares the Ascendant. There seems to be no clear winner here. Jupiter is not particularly dominant; it is only the term ruler of the Lot of Fortune. Although it is in an effective place and trines Fortune, this rationale seems weak for giving it the rulership instead of the Moon.

For Venus sharing the rulership, there are the following considerations. Venus is in its own house. It is in a phase of visibility (rising before the sun and not combust). It is in an effective place (the 2<sup>nd</sup>) in a nocturnal horoscope, according to Paulus.

However, it is still something of a mystery as to why the astrologer chose Jupiter as the "master of the nativity," unless the fact that it was well placed in the Ascendant, well ahead of the sun and in a phase of visibility, is the term ruler of the prenatal full Moon and aspects both the luminaries and the Lot of Fortune, gives it more advantages than the equally well-placed and more dignified Moon.

## Lots

Lots have an oversized presence in our horoscope: seven lots are prominently featured. Our horoscope is the earliest, and only original documentary, chart to contain so many lots.<sup>69</sup> Using the formulae of Paulus, they are calculated by degree and minute, and supplied with both their house and term ruler. More exclusively, then, than the other techniques supplied in this horoscope, these lots are directly associated with Paulus Alexandrinus. Besides his later commentator Olympiodorus, he is the only author in the extant corpus to provide formulae for these lots. His chapter on lots mentions each by name, with its formula, and associates it with a planet: “Suitably, the lots have this origin: since by nature the Moon is set down as Fortune, the Sun Daimon, Aphrodite Eros, the [star] of Hermes Necessity, that of Ares Courage, that of Zeus Victory, and that of Kronos Nemesis.”<sup>70</sup> This order matches the listing of the lots in our horoscope. Paulus’s commentator, Olympiodorus (writing in 564 CE),<sup>71</sup> spells out the direct connection of each lot to a celestial body: “...7 lots owing to the number of the 7 stars.”<sup>72</sup>

At present this is the only documentary horoscope to contain all of the “planetary” lots that Paulus describes, using the formulae he provides. In literary horoscopes, one rather corrupt text associated with Olympiodorus likely calculates the Lot of Eros according to Paulus’s formula.<sup>73</sup> No other documentary or literary horoscope up to the end of Late Antiquity uses any of Paulus’s lot formulae for the Lots of Eros, Necessity, Courage, Victory or Nemesis. In the Arabic period, a horoscope transmitted by Abū Ma’shar includes the Lots of Courage and Victory, and a lot called “Intellect and Native Wit,” the formula of which is identical to the Paulus formula for the Lot of Necessity.<sup>74</sup> Finally, a nativity calculated for September 3, 905 CE, calculates, among others, the Lots of Fortune, Daimon and Eros.<sup>75</sup> But the calculation for the Lot of Eros does not use Paulus’s formula.<sup>76</sup>

### The “Planetary” Lots in Context

Prior to the discovery of this horoscope, only one literary and no documentary horoscopes contained the Lots of Eros and/or Necessity using Paulus’s formulae, and none before the end of Late Antiquity contained the Lots of Courage, Victory or Nemesis. Our horoscope is unique within the extant corpus in containing all seven lots as described, with formulae and meanings, by Paulus.

Before Paulus, who was writing in 378 CE,<sup>77</sup> the Lots of Fortune and (less so) Daimon appear somewhat regularly in documentary and literary horoscopes, as well as (albeit rarely) the Lots of Eros and Necessity.<sup>78</sup> Vettius Valens and Firmicus Maternus are the main authors who discuss interpretation and provide formulae for these four lots. However, the formulae they use for the Lots of Eros and Necessity are not those that Paulus specifies in his astrological treatise.<sup>79</sup> Thus, before the fourth century CE, no documentary evidence exists for use of the Paulus formulae, and no calculation of the Lots of Courage, Victory or Nemesis. In astrological texts said to antedate Paulus, only Antiochus of Athens provides a short section on these lots (see below).

Previous work on lots has posited two traditions of calculation for the lots of Eros and Necessity.<sup>80</sup> One tradition may be designated “Hermetic,” after the assertion by Olympiodorus and a scholiast for Paulus that these lots derive from a book by Hermes Trismegistus called the *Panaretos*.<sup>81</sup> The other tradition is called “Egyptian,” drawing on a scholion to a passage in Hephaestio’s *Apotelesmatika* III, 6.11, describing two methods for casting the Lots of “Necessity and Eros according to Hermes Trismegistus or, just as in the 4<sup>th</sup> book, Dorotheus gives an account of the opinion of the Egyptians.”<sup>82</sup> This scholion thus supplies evidence of two lot traditions for these lots in antiquity.

One of Paulus’s passages on the planetary lots has a number of similarities to a passage that the later compiler Rhetorius claims are from the *Thesaurus* of Antiochus of Athens, whose probable *floruit* was the second century CE. Antiochus associates a planet or luminary with each lot, but gives no formula to

calculate them, or an origin (we can assume they are the same lots Paulus describes because of the similar wording).<sup>83</sup> Possibly Paulus and Antiochus drew on a similar source, or Paulus was the first to come across this passage by Antiochus, because no other author in the extant literature before 378 CE mentions such lots. In the second century, Vettius Valens specifically associates the Lots of Fortune, Daimon, Eros and Necessity with several astrological techniques (e.g. *Anthology* II 37, IV 4-10, 25 [Pingree 1986]), but does not use the Paulus formulae and does not mention any other “planetary” lots. Paulus’s near contemporary, Firmicus Maternus, mentions a Lot of Nemesis along with his versions of the Lots of Eros and Necessity (*Mathesis*, VI.32), but his formulae for them also do not match Paulus’s.

It should be emphasized that Paulus himself does not mention Hermes as the originator of these lots, nor does the word “*Panaretos*” appear anywhere in his text, but only in the title of Chapter 23. The word *panaretos* means “all-virtuous.” In the extant corpus of Greek works, its association to a book, as in the phrase “παναρέτος βιβλος” (or variants) is rare. *Panaretos* does not appear in reference to a book until the fourth century CE. The phrase “παναρέτω βιβλω” appears in Pap. Mag. Leid. J 395 (PGM XIII.981-982) where it is associated with “Ptolemaica.”<sup>84</sup> Its association with Hermes Trismegistus appears only in the Paulus-connected texts. Other uses of the word *Panaretos* appear to be restricted to later ecclesiastical writings (there is mention in the fourth century of a “*Panaretos*” on the wisdom of Solomon).<sup>85</sup> It does not seem to have anything to do with the astrological *Panaretos*.

It is difficult to judge the date of the *Panaretos*. No extant texts earlier than the fourth century mention it. One could assume, as the Gundels did, that any Hermetic text would likely have been written around the 2<sup>nd</sup> century BCE.<sup>86</sup> But that any mention of the *Panaretos* does not arise until the fourth century suggests that the text was unknown before then. It may have been discovered during that time. In addition, Paulus does not mention Hermes Trismegistus as the author. Perhaps Olympiodorus attached the name of Hermes to the text to give it authenticity, or the text did have the name of Hermes attached to it (but this was not noted until the Olympiodorus commentary). In any case, P.Berl. 9825, containing the chart of a birth in 319, fits into this fourth-century timeframe. Because of the uncertainty surrounding the origins of these lots, it is testamentary evidence of the work of Paulus Alexandrinus, as well as an exclusive and important witness to the use of all the “planetary lots” in practice.

### Conclusions

This horoscope undoubtedly ranks among the most comprehensive of antiquity. The amount of technical data it includes puts it near, if not at the top, of elaborate horoscopes of antiquity. It is significant both astronomically and astrologically.

Astrologically, it is an astounding example of the variety of technical data and methods used by astrologers in late antiquity. As this astrological commentary has shown, a number of the techniques included in our horoscope’s data have been covered by Paulus Alexandrinus in his *Introduction*. Among his specialties, *dodekatemoria*, *monomoiriai*, presiding and managing planets and, especially, “planetary” lots, whose formulae Paulus is the first to delineate, appear in our papyrus.

While it is highly unlikely that a definitive author of this horoscope will ever be known, these connections to Paulus and his work provoke some further attention. The timeframe of 319 easily falls within Paulus’s lifetime (he wrote the *Introduction* in 378 CE). That the horoscope was cast for the latitude of Syene, in Upper Egypt, suggests an Egyptian link, and Paulus was known to have practiced astrology in Alexandria. A compelling piece of evidence is, of course, the seven planetary lots calculated with the formulae described first by Paulus (and, during Late Antiquity, later taken up only by his commentator Olympiodorus). It is possible, then, that the horoscope was calculated by someone following the practices of Paulus as a student, perhaps practicing the calculation of multiple techniques as a student exercise.<sup>87</sup> Equally, we have no way of knowing whose chart was calculated. Although the date of birth falls in the

correct timeframe for Paulus himself, and there are examples of astrologers casting their own horoscopes both for personal use and as a teaching tool,<sup>88</sup> it goes beyond the bounds of speculation to suggest that the horoscope could be his. Though any final certainty is unlikely, the tantalizing authorial hints we obtain from this birthchart make it an even more unusual and important example of a late antique horoscope.

## Notes

<sup>1</sup> The most recent checklist of ancient horoscopes in Greek, Heilen 2015: 2.213-316, lists 345 horoscopes of which 168 are original documents. This is nearly twice as many horoscopes as were collected in Neugebauer & Van Hoesen 1959 (texts in this collection will be designated here as GH followed by the text numbers). The greatest increase is in the number of known horoscopes on papyri; most of the additional papyrus horoscopes are collected in Baccani 1992 (texts designated as OG followed by the text numbers) and Jones 1999 (texts designated as P.Oxy. astr. followed by the text numbers, which are also part of the P.Oxy. sequence within volume 61 of *The Oxyrhynchus Papyri*). Heilen's listings will be designated in this paper as "Hor. gr." followed by Heilen's text number, which, like GH text numbers, represent the exact or approximate date of the nativity. The horoscope of P.Berl. 9825 with which the present paper is concerned is Hor. gr. 319.XI.18-19.

<sup>2</sup> Lots (κλήροι) are astrologically significant points whose longitudes were generally computed as linear combinations of the longitudes of heavenly bodies and other significant points. Dignities are locations or zones in the zodiac having astrological associations with or rulerships by heavenly bodies. Greek astrology recognized five canonical dignities: houses (entire zodiacal signs), exaltations (signs that ameliorate the astrological effect of a heavenly body; the opposite sign, the "depression," worsens it), triplicities (sets of three signs at intervals of four signs), terms (unequal subdivisions of signs, typically five to a sign), and decans (equal thirds of signs, sometimes called faces).

<sup>3</sup> For this genre see Jones 1999: 1.8, 10-11, and 46-47.

<sup>4</sup> Since a horoscopic document may have been written down at any date from the individual's birth to several decades later, paleographical datings should in principle average later than the corresponding birthdates, say by a decade or two. In the present discussion we neglect this distinction.

<sup>5</sup> First published in de Jong & Worp 1995, and see also Heilen 2004. The medium of this horoscope is a wooden board; both the astronomical and astrological data were incompetently determined.

<sup>6</sup> Unpublished; description available at <http://papyri.uni-leipzig.de/>.

<sup>7</sup> The authors are grateful to the Ägyptisches Museum und Papyrussammlung, Staatliche Museen zu Berlin Preußischer Kulturbesitz, and its former curator, Dr. Fabian Reiter, for providing access to this papyrus and permission to publish its contents provisionally in advance of its formal edition.

<sup>8</sup> Neugebauer & Van Hoesen 1959: 1-2.

<sup>9</sup> Jones 1999: 1.344-348.

<sup>10</sup> [http://www.staff.science.uu.nl/~gent0113/astro/almagestephemeris\\_main.htm](http://www.staff.science.uu.nl/~gent0113/astro/almagestephemeris_main.htm)

<sup>11</sup> For a critical edition of the tables of right and oblique ascensions of the *Handy Tables* see Tihon & Mercier 2011.

<sup>12</sup> For longitudes we have used the JPL Horizons ephemeris (<http://ssd.jpl.nasa.gov/horizons.cgi>); for the lunar orbital parameters, the software Alcyone Ephemeris 4.3.

<sup>13</sup> Jones 2010.

<sup>14</sup> Jones 2010: 11-15 and 30-35.

<sup>15</sup> On Ptolemy's evolving latitude theories for the planets see Swerdlow 2005.

<sup>16</sup> Neugebauer 1975: 2.669-674.

<sup>17</sup> Digitizations of these manuscripts may be viewed respectively at [https://socrates.leidenuniv.nl/R/-?func=dbin-jump-full&object\\_id=2866440](https://socrates.leidenuniv.nl/R/-?func=dbin-jump-full&object_id=2866440), <http://teca.bmlonline.it/TecaRicerca/index.jsp> (search for “plut.28.26”), and [http://digi.vatlib.it/view/MSS\\_Vat.gr.1291](http://digi.vatlib.it/view/MSS_Vat.gr.1291).

<sup>18</sup> Toomer 1984: 341-399; Peters & Knobel 1915: 27-50; Heiberg 1898-1903.

<sup>19</sup> Graßhoff 1990: 275-316.

<sup>20</sup> In *F* the copyist or his source skipped a line so that the former of this pair of stars is given the data for the latter.

<sup>21</sup> Heiberg adopts a manuscript variant +0° 20', but the preponderance of the *Almagest* tradition in both Greek and Arabic has +0° 10'; see Toomer's note *ad loc*.

<sup>22</sup> *L*: Ο ΕΠΟΜΕΝ(ΟC) Κ(ΑΙ) ΝΟΤΙΟΤ(ΕΡΟC) Κ(ΑΙ) ΔΕΥΤΕΡΟ(C) ΥΠ' ΑΥΤ(ΟΥ); *F*: Ο ΕΠΟΜΕΝΟC ΑΥΤΟΥ ΚΑΙ ΝΟΤΙΟC ΔΕΥΤΕΡΟC; *V*: Ο ΕΠΟΜΕΝΟC ΚΑΙ ΔΕΥΤΕΡΟC ΩΝ ΝΟΤΙΩΤΕΡΟC ΑΥΤΟΥ. The name in the *Almagest* is quite different: τῶν ἐν τῇ ἀριστερᾷ πτέρυγι δὲ ὁ προηγούμενος.

<sup>23</sup> See Jones 1999.

<sup>24</sup> The term “dignities” is here used for convenience to describe the rulers of various portions or groups of zodiacal signs. At the time this horoscope was cast, there was no Greek equivalent word to describe this practice. See Bezza 2007: 240-241.

<sup>25</sup> See Heilen 2015: 1.204-333; 2.522.

<sup>26</sup> The Descendant and Lower Midheaven appear more seldom, but could easily be inferred, since the Descendant will be exactly opposite the Ascendant, and the Lower Midheaven exactly opposite the Midheaven. For the less frequent calculation of the Midheaven, see Hand 2007: 138-143.

<sup>27</sup> Dignities have not been included in this tally, due to their more frequent use than the other techniques, especially in literary horoscopes where they are important for interpretation. An analysis of the reasons that a horoscope would include various dignity systems will appear below.

<sup>28</sup> Preferring these criteria allows better comparison with horoscopes more similar to ours. Included rarely are Egyptian/“Old Coptic” (P.Lond. 1.98, but the horoscope proper is in Greek) and Egyptian/Demotic (OMM 134: see Ross 2006: 109-117; Ross 2011: 56-62) horoscopes containing technical data.

<sup>29</sup> The lots most frequently calculated in extant charts are the Lot of Fortune and the Lot of Daimon. For more on this practice, and a list, see Greenbaum 2008.

<sup>30</sup> Called “a preceding ἀποκρούσις” in PSI 23,a (no. 338 in Neugebauer & Van Hoesen 1959: 66), suggesting a reference to the previous lunation.

<sup>31</sup> For the details of these charts, see Greenbaum 2016: 423-438 (Appendix 7.A).

<sup>32</sup> It is, of course, impossible to tell whether the horoscope was calculated shortly after the birth of the child or later (but obviously not before September 81: see Neugebauer & Van Hoesen 1959: 24).

<sup>33</sup> For more on this technique, see Denningmann 2005: 386-474; Denningmann 2007.

<sup>34</sup> On conception and pregnancy in astrology, see Frommhold 2004.

<sup>35</sup> See Greenbaum 2007: 173-179, in part superseded in Greenbaum 2016: 333-334; Heilen 2015: 2.1167ff.

<sup>36</sup> See Greenbaum 2016: 255-266, 424-425.

<sup>37</sup> Neugebauer & Van Hoesen 1959: 25.

<sup>38</sup> For analysis, see Neugebauer & Van Hoesen 1959: 36-37; Greenbaum and Ross 2010: 158-162.

<sup>39</sup> See Neugebauer 1943: 116-117; Greenbaum 2016: 304 n. 7.

<sup>40</sup> See Greenbaum 2016: 367-378.

<sup>41</sup> Heilen 2010: 62; Heilen 2015: 1.310; Jones 1987: 21-22 and (for the relation of the manuscripts with the abridged version to Par. gr. 2425) 25.

<sup>42</sup> The attribution to Eutocius was tentatively accepted by Neugebauer and Van Hoesen (Neugebauer & Van Hoesen 1959: 188-189), with more definitive ascription and analysis by Heilen 2010: 62; see also Heilen 2015: 1.310 (and bibliography).

<sup>43</sup> Heilen 2010: 62; Heilen 2015: 1.310, citing Toomer 1976: 18 for the speculative suggestion that the horoscope may pertain to Eutocius's own birthdate.

<sup>44</sup> As in the Dorothean system: see *Carmen Astrologicum* I, 1 (Pingree 1976).

<sup>45</sup> See Neugebauer & Van Hoesen 1959: 36; Greenbaum 2016: 304 n. 7.

<sup>46</sup> See Holden 2009: ix-x, *contra* Pingree 1976: xii. A critical edition of this text by Pingree is being prepared for publication by Stephan Heilen.

<sup>47</sup> CCAG 8.1: 243.20-244.2: ...τοὺς δεκανοὺς ἦτοι πρόσωπα...τὰς μονομοιρίας, τὰς λαμπρομοιρίας, τὰ δωδεκατεμόρια καὶ τὰ πλάτη τῶν ἀνέμων καὶ τοὺς βαθμοὺς, τὰς φάσεις καὶ τοὺς στηριγμοὺς καὶ τὰς τῶν ἀπλανῶν συνεγγιζούσας αὐτοῖς μοιρικὰς παραναντολάς...". Trans. Greenbaum.

<sup>48</sup> These are various forms of a "housemaster" (*oikodespotes*). See Greenbaum 2016: 255-266.

<sup>49</sup> Ascribed to Nechepso and Petosiris by Julius Firmicus Maternus, *Mathesis* III, Intro.4.

<sup>50</sup> The earliest astrologer to do this was Thrasyllus, in CCAG 8.3: 100.27-30.

<sup>51</sup> Scholion 15, Paulus, *Introduction to Astrology (Elementa Apotelesmatica)*, ed. Boer 1958: 107.14-108.8.

<sup>52</sup> Ed. Feraboli 1994: 224-232.

<sup>53</sup> P. Oxy. astr. 4283 (Hor. gr. 250-350b) also mentions *monomoiria*.

<sup>54</sup> See Rochberg-Halton 1988: 57-59 (reprinted in Rochberg 2010: 156-160); Neugebauer & Van Hoesen 1959: 6.

<sup>55</sup> Rochberg-Halton 1988: 58; Rochberg 2010: 157.

<sup>56</sup> Seven charts include it: P.Oxy. 31.2555 (Hor. gr. 46.V.13), P.Lond. 1.130 (Hor. gr. 81.III.31), P.Lond. 1.98 (Hor. gr. 95.IV.13), P.Oxy. astr. 4277 (Hor. gr. 150-250b), Hor. gr. 479.VII.14, Hor. gr. 483.VII.8, and Hor. gr. 487.IX.5.

<sup>57</sup> CCAG I: 99 (bottom).1-100.8.

<sup>58</sup> CCAG VII: 114.

<sup>59</sup> CCAG I: 128-129.

<sup>60</sup> See the table of this in Greenbaum 2016: 135 (Table 4.1).

<sup>61</sup> CCAG I: 107.12-15; duplicated in CCAG VI: 66.25-67.1. Trans. Greenbaum.

<sup>62</sup> Its data produce a horoscope cast for around the seventh hour of the night; the birth in fact would have taken place at about two hours after midnight but still on the previous day, Wednesday, November 18.

<sup>63</sup> Valens, *Anthology* I, 9.3-11; Pingree 1986, 25.18-26.2; CCAG 7: 88-90 and Cassius Dio, *Roman History*, 37.18-19 (ed. Cary 1914-1927, vol. III), respectively. Cassius Dio ascribes this tradition to the Egyptians. These are just some of the sources that mention the planetary week and day and night hours. I am very grateful to Stephan Heilen for explaining the issue of epochs and their use in antiquity, as well as providing sources.

<sup>64</sup> Neugebauer & Van Hoesen 1959, 167-169 discuss epochs in antiquity. They mention both the Egyptian morning epoch and the Greek evening epoch, in reference to horoscope P.Lond. 1.130 (Hor. gr. 81.III.31), which uses the Alexandrian calendar: it may be "the outcome of a combination of the original Greek evening epoch with the traditional Egyptian morning epoch" (169, left column). So two kinds of epochs were used in antiquity.

<sup>65</sup> Neugebauer & Van Hoesen 1959, 168 right column; Divjak and Wischmeyer eds. 2014, I.110-139. See also a fragment from Potentia, Italy, ca. 100 CE: *CIL IX*, No. 5808.

<sup>66</sup> Paulus, *Introduction*, Ch. 36, Boer 1958: 96.3-6. Trans. Greenbaum. Paulus normally uses *κατοπτρεύω* to refer to difficult aspects – square or opposition – or aspects from a malefic. But in this context it may mean any aspect.

<sup>67</sup> Paulus, *Introduction*, Ch. 24, Boer 1958: 63.8-10.

<sup>68</sup> *Ibid.*, ch. 36, Boer 1958: 96.22-97.1. Trans. Greenbaum. This means that the rulers of Fortune or Daimon must aspect the lots (and “receive” them by a dignity) in effective places in order to become the “authority of the nativity.”

<sup>69</sup> Two literary horoscopes comparable to ours contain lots calculated according to Paulus’ formulae. They are dated 787 (in Abū Ma’shar, *De revolutionibus nativitatum*, ed. Pingree 1968; Hor. gr. 787.VIII.10 in Heilen 2015: 1.313) and 905 CE (the nativity of Constantine VII Porphyrogenitus: see Pingree 1973; Hor. gr. 905.IX.3 in Heilen 2015: 1.314).

<sup>70</sup> Paulus, *Introduction*, Ch. 23, Boer 1958: 49.11-15. Trans. Greenbaum.

<sup>71</sup> He mentions the dates of some of his lectures in his *Commentary on Paulus*. See also Westerink 1971, and Warnon 1967. In Chapter 21, he mentions that “Hermes Trismegistus has written about these lots in the book called *Panaretos*” (Boer 1962: 42.6-7). In Chapter 22 he again mentions Hermes Trismegistus in connection with the Lot of Fortune (Boer 1962: 46.8-12). Finally, he again says “And these...are the seven lots in the *Panaretos*, written about by the most divine Hermes Trismegistus, which Paulus set forth here.” (Boer 1962: 51.13-15). All trans. Greenbaum.

<sup>72</sup> Olympiodorus, *Commentary*, Ch. 21.4, Boer 1962: 42.11-12. Trans. Greenbaum.

<sup>73</sup> Olympiodorus, *Commentary*, Boer 1962: 59.8-15. See Greenbaum 2016: 375-377, 480.

<sup>74</sup> Abū Ma’shar, *De revolutionibus nativitatum*, Pingree 1968: 130.1-131.14.

<sup>75</sup> Pingree 1973.

<sup>76</sup> For more analysis of these last two mentioned charts, see Greenbaum 2016: 372-378, 479-482.

<sup>77</sup> In Chapter 20 of his *Introduction*, he calculates on what day of the week ‘today, the 20<sup>th</sup> of Mecheir, 94 years from Diocletian’ fell. It is equivalent to February 14, 378 CE (a Wednesday). Thus we know that Paulus was writing the *Introduction* in 378 CE.

<sup>78</sup> See Greenbaum 2008; Greenbaum 2009, Chapters 6 and 7; Greenbaum 2016: 356-377.

<sup>79</sup> Instead of using the arc between the Lot of Fortune or Daimon and the planet in question, both Valens and Firmicus, in different iterations, use the arc between the Lots of Fortune and Daimon, projecting this arc either clockwise or counterclockwise from the Ascendant, to construct the Lots of Eros and Necessity. (Thus the two lots appear in mirror image from the Ascendant.) For further detail, see Greenbaum 2016: 360-367.

<sup>80</sup> Greenbaum 2009: 227-232; Greenbaum 2016: 360-367.

<sup>81</sup> Olympiodorus, *Commentary*, Ch. 21, Boer 1962: 42.6-7; Paulus, *Introduction*, Title of Ch. 23, Boer 1958: 47.15 and Scholion 48, Boer 1958: 118.24-119.7.

<sup>82</sup> Dorotheus, *Carmen Astrologicum*, Scholium ad Heph. III 6, 11 (Pingree 1976: 433.14-434.1).

<sup>83</sup> Paulus, *Introduction*, ch. 23, Boer 1958: 49.17-50.16; Antiochus, *Thesaurus*, ch. 47, in *CCAG I*: 160.11-28. An example of the similarities. Paulus: “Eros signifies appetites and desires occurring by choice, and it becomes responsible for friendship and favor. Necessity signifies imprisonments, subordinations, battles and wars, and it makes enmities, hatreds, condemnations and all the other constraining circumstances which happen to humans as their lot at birth.” Antiochus: “Aphrodite’s Lot—the Lot of Eros—signifies appetites, desires, and things that come to be by choice, and it is indicative of



friendship and favor. Hermes' Lot—the Lot of Necessity—signifies imprisonments, wars, enmities, hatreds, condemnations and all the other constraining circumstances which are brought about by humans.”

<sup>84</sup> For the dating of the papyrus, see Daniel 1991: x-xi: “At page 21, line 23  $\chi\omicron\lambda\omicron\upsilon\epsilon$  (or perhaps some words earlier) a second hand ( $h^2$ ) took over and wrote to the end of page 25; ... The first hand is characteristic of the middle of the fourth century AD; by itself the second hand might have been dated somewhat earlier.” Thus the likely date for the papyrus *in toto* is the middle of the 4<sup>th</sup> century CE. Whether this is the same book later associated with Paulus and the seven lots cannot be verified; even so, the fourth-century date post-dates the discussion of lots by Valens.

<sup>85</sup> See Epiphanius, *On Weights and Measures*, 119 (Moutsoulas 1973); also *On Weights and Measures* as quoted in John of Damascus (Kotter 1973: 210-11).

<sup>86</sup> Gundel and Gundel 1966: 11, n. 1, cite the *Panaretos* as Hermetic. At 238 they say that one of Paulus's sources is Hermes Trismegistus, and the *Panaretos*, but do not explicitly assign the *Panaretos* to Hermes: “Als seine Quellen nennt er [i.e. Paulus] Hermes Trismegistos, die *Panaretos*, Apollonarios und Apollonius...”. (Yet Paulus does not mention Hermes in association with lots; only the scholiast does this.) Scholars subsequently citing this work (or citing works that cite it) accept the Gundels' account, causing a domino effect on later scholars using the same chain of citation, e.g.: Couliano 1984: 143, who cites the Gundels; Quispel 1992: 9 (= Quispel 2000: 155), who cites Couliano; and DeConick 2005: 207 and n. 51, who cites Quispel.

<sup>87</sup> This would account for the errors in some calculations, and as well the faulty grammar of the papyrus.

<sup>88</sup> Other astrologers who include their own birthcharts in their astrological teaching texts include Manetho the astrologer, Vettius Valens and Hephaestio of Thebes.

## Manuscripts

*Leiden B. P. G.* 78, ff. 142r-145r. [https://socrates.leidenuniv.nl/R/-?func=dbin-jump-full&object\\_id=2866440](https://socrates.leidenuniv.nl/R/-?func=dbin-jump-full&object_id=2866440)

*Laurentianus pluteus* 28,26, ff. 124v-127r. <http://teca.bmlonline.it/TecaRicerca/index.jsp> (search for “plut.28.26”)

*Laurentianus pluteus* 28,34, ff. 141v-143v <http://teca.bmlonline.it/TecaRicerca/index.jsp> (search for “plut.28.34”)

*Parisinus graecus* 2425, ff. 216v-219v. <http://gallica.bnf.fr/ark:/12148/btv1b107240960>

*Parisinus graecus* 2506, f. 73. <http://gallica.bnf.fr/ark:/12148/btv1b10722216r?rk=21459;2>

*Vaticanus graecus* 1291, ff. 90v-94v. [http://digi.vatlib.it/view/MSS\\_Vat.gr.1291](http://digi.vatlib.it/view/MSS_Vat.gr.1291)

## Bibliography

Alcyone Ephemeris Calculator. [http://www.alcyone.de/alcyone\\_ephemeris.html](http://www.alcyone.de/alcyone_ephemeris.html)

Baccani, Donata. 1992. *Oroscopi greci: documentazione papirologica*. Ricerca papirologica 1. Messina: Sicania.

Bezza, Giuseppe. 2007. “The Development of an Astrological Term – from Greek *hairesis* to Arabic *hayyiz*.” *Culture and Cosmos* 11. 1 and 2: 229-260.

Boer, Emilie, ed. 1958. *Paulus Alexandrinus. Elementa Apotelesmatica*. Leipzig: B. G. Teubner.

Boer, Emilie, ed. 1962. *Olympiodorus. Heliodori, ut dicitur, in Paulum Alexandrinum Commentarium*. Leipzig: B. G. Teubner.

- Cary, Earnest, trans. 1914-1927. *Dio Cassius. Roman History*. 9 vols. Loeb Classical Library. Cambridge, MA: Harvard University Press.
- CCAG = *Catalogus Codicum Astrologorum Graecorum*. 1898-1953. Franz Cumont et al., eds. 12 vols. Brussels: Henri Lamertin.
- CIL = *Corpus Inscriptionum Latinarum*. 1883. Theodor Mommsen, ed. Vol. IX. Berlin: Georg Reimer.  
[http://cil.bbaw.de/cil\\_en/dateien/cil\\_baende.html](http://cil.bbaw.de/cil_en/dateien/cil_baende.html).
- Couliano, Ioan P. 1984. *Expériences de l'extase. Extase, ascension et récit visionnaire de l'Hellénisme au Moyen Âge*. Paris: Payot, 1984.
- Daniel, Robert W., ed. 1991. *Two Greek Magical Papyri in the National Museum of Antiquities in Leiden. A Photographic Edition of J 384 and J 395 (= PGM XII and XIII)*, Opladen: Westdeutscher Verlag.
- DeConick, April. 2005. *Recovering the Original Gospel of Thomas: A History of the Gospel and its Growth*. London/New York: T & T Clark.
- de Jong, Teije, and Klaas A. Worp. 1995. "A Greek Horoscope from 373 A.D." *Zeitschrift für Papyrologie und Epigraphik* 106: 235-240.
- Denningmann, Susanne. 2005. *Die astrologische Lehre der Doryphorie: Eine soziomorphe Metapher in der antiken Planetenastrologie*. Beiträge zur Altertumskunde 214. Munich/Leipzig: K. G. Saur.
- Denningmann, Susanne. 2007. "The Ambiguous Terms ἐψά and ἐσπερία ἀνατολή, and ἐψά and ἐσπερία δύσις." *Culture and Cosmos* 11.1 and 2: 189-210.
- Divjak, Johannes and Wolfgang Wischmeyer, eds. 2014. *Das Kalenderhandbuch von 354. Der Chronograph des Filocalus*. 2 vols. Vienna: Verlag Holzhausen GmbH.
- Feraboli, Simonetta, ed. 1994. *Hermetis Trismegisti: De triginta sex decanis*. Hermes Latinus IV/1 (Corpus Christianorum). Turnhout, Belgium: Brepols.
- Frommhold, Katrin. 2004. *Die Bedeutung und Berechnung der Empfängnis in der Astrologie der Antike*. Vol. 38, Orbis antiquus 38. Münster: Aschendorff.
- Graßhoff, Gerd. 1990. *The History of Ptolemy's Star Catalogue*. Studies in the History of Mathematics and Physical Sciences 14. New York: Springer-Verlag.
- Greenbaum, Dorian Gieseler. 2007. "Calculating the Lots of Fortune and Daemon in Hellenistic Astrology." *Culture and Cosmos* 11.1 and 2: 163-187.
- Greenbaum, Dorian Gieseler. 2008. "The Lots of Fortune and Daemon in Extant Charts from Antiquity (First Century BCE to Seventh Century CE)." *MHNH* 8: 173-190.
- Greenbaum, Dorian Gieseler. 2009. *The Daimon in Hellenistic Astrology: Origins and Influence*. Ph.D. dissertation, Warburg Institute, University of London.
- Greenbaum, Dorian Gieseler. 2016. *The Daimon in Hellenistic Astrology: Origins and Influence*. Ancient Magic and Divination 11. Leiden/Boston: Brill.
- Greenbaum, Dorian Gieseler and Micah T. Ross. 2010. "The Role of Egypt in the Development of the Horoscope." In *Egypt in Transition: Social and Religious Development of Egypt in the First Millennium BCE*, eds. Ladislav Bareš, Filip Coppens and Kveta Smolarikova, 146-182. Prague: Faculty of Arts, Charles University in Prague.
- Gundel, Wilhelm and Hans Georg Gundel. 1966. *Astrologumena. Die astrologische Literatur in der Antike und ihre Geschichte*. Wiesbaden: Steiner.
- Hand, Robert. 2007. "Signs as Houses (Places) in Ancient Astrology." *Culture and Cosmos* 11.1 and 2: 135-162.
- Heiberg, J. L., ed. 1898. *Claudii Ptolemaei Opera Quae Exstant Omnia*. Vol. 1. *Syntaxis Mathematica* (2 parts). Leipzig: B. G. Teubner.

- Heilen, Stephan. 2004. "Astrological Remarks on the New Horoscopes from Kellis." *Zeitschrift für Papyrologie und Epigraphik* 146 (2004): 131-136.
- Heilen, Stephan. 2010. "Ptolemy's Doctrine of the Terms and Its Reception." In *Ptolemy in Perspective: Use and Criticism of his Work from Antiquity to the Nineteenth Century*, ed. Alexander Jones, 45-93. Archimedes 23. Dordrecht/Heidelberg/London/New York: Springer Science and Business Media, 2010.
- Heilen, Stephan. 2015. *Hadriani genitura. Die astrologischen Fragmente des Antigonos von Nikaia. Edition, Übersetzung und Kommentar*. 2 vols. Texte und Kommentare 43. Berlin: De Gruyter.
- Holden, James Herschel, trans. 2009. *Rhetorius the Egyptian. Astrological Compendium containing His Explanation and Narration of The Whole Art of Astrology*. Tempe AZ: American Federation of Astrologers.
- Jet Propulsion Laboratory, California Institute of Technology. Horizons Ephemeris. <http://ssd.jpl.nasa.gov/horizons.cgi>
- Jones, Alexander. 1987. An Eleventh-Century Manual of Arabo-Byzantine Astronomy. *Corpus des astronomes byzantins* 3. Amsterdam: J. C. Gieben.
- Jones, Alexander. 1999. *Astronomical Papyri from Oxyrhynchus*. 2 vols. Philadelphia: American Philosophical Society.
- Jones, Alexander. 2010. "Ancient Rejection and Adoption of Ptolemy's Frame of Reference for Longitudes." In *Ptolemy in Perspective: Use and Criticism of his Work from Antiquity to the Nineteenth Century*, ed. Alexander Jones, 11-44. Archimedes 23. Dordrecht/Heidelberg/London/New York: Springer Science and Business Media.
- Kotter, P. B., ed. 1973. *Epiphanius*. "De mensuris et ponderibus (ap. Joannem Damascenum) (excerpta Graecum 8)." In *Die Schriften des Johannes von Damaskos*. Berlin: De Gruyter.
- Monat, P., ed. and trans. 1992-1997. *Julius Firmicus Maternus. Mathesis*. 3 vols. Collection des universités de France. Paris: Les Belles Lettres.
- Moutsoulas, E. 1973. "Τὸ 'Περὶ μέτρων καὶ σταθμῶν' ἔργον Ἐπιφανίου τοῦ Σαλαμῖνος." *Θεολογία* 44: 157-200.
- Neugebauer, Otto. 1943. "Demotic Horoscopes." *Journal of the American Oriental Society* 63.2: 115-127.
- Neugebauer, Otto. 1975. *A History of Ancient Mathematical Astronomy*. 3 vols. Berlin/Heidelberg/New York: Springer-Verlag.
- Neugebauer, Otto and H. B. Van Hoesen. 1959. *Greek Horoscopes*. Philadelphia: The American Philosophical Society.
- Peters, Christian H. F. and Edward B. Knobel. 1915. *Ptolemy's Catalogue of Stars: A Revision of the Almagest*. Washington: The Carnegie Institution.
- Pingree, David, ed. 1968. *Abū Ma'shar. De revolutionibus nativitatū*. Leipzig: B. G. Teubner.
- Pingree, David. 1973. "The Horoscope of Constantine VII Porphyrogenitus." *Dumbarton Oaks Papers* 27: 217-231.
- Pingree, David, ed. 1976. *Dorotheus of Sidon. Carmen Astrologicum*. Leipzig: B. G. Teubner.
- Pingree, David, ed. 1986. *Vettius Valens. Anthologiarum libri novem*. Leipzig: B.G. Teubner.
- Quispel, Gilles. 1992. "Hermes Trismegistus and the Origins of Gnosticism." *Vigiliae Christianae* 46.1: 1-19.
- Quispel, Gilles. 2000. "Hermes Trismegistus and the Origins of Gnosticism." (Reprint of Quispel 1992.). In *From Poimandres to Jacob Böhme: Gnosis, Hermetism and the Christian Tradition*, eds. R. van den Broek and C. van Heertum. Pimander 4. Amsterdam: Bibliotheca Philosophica Hermetica.

- Rochberg-Halton, Francesca. 1988. "Elements of the Babylonian Contribution to Hellenistic Astrology." *Journal of the American Oriental Society* 108, no. 1: 51-62.
- Rochberg, Francesca. 2010. *In the Path of the Moon: Babylonian Celestial Divination and its Legacy*. Studies in Ancient Magic and Divination 6. Leiden/Boston: Brill.
- Ross, Micah T. 2006. *Horoscopic Ostraca from Medīnet Mâdi*. Ph.D. Dissertation, Brown University.
- Ross, Micah. 2011. "A Provisional Conclusion to the Horoscopic Ostraca from Medīnet Mâdi". *Egitto e Vicino Oriente* 34: 47-80.
- Swerdlow, Noel M. 2005. "Ptolemy's Theories of the Latitude of the Planets in the Almagest, Handy Tables, and Planetary Hypotheses." In *Wrong for the Right Reasons*, eds. J. Z. Buchwald and A. Franklin, 41-71. Archimedes 11. Berlin [etc.]: Springer.
- Tihon, Anne and Raymond Mercier. 2011. *Les «Tables Faciles» de Ptolémée: 1.a. Tables A1-A2. Introduction, édition critique; Ptolemy's Handy Tables: 1b. Tables A1-A2. Transcription and Commentary*. Publications de l'Institut Orientaliste de Louvain 59a-b. Louvain-la-Neuve: Université Catholique de Louvain/Peeters.
- Toomer, Gerald J., ed. 1976. *Diocles, On Burning Mirrors. The Arabic Translation of the Lost Greek Original*. Sources in the History of Mathematics and Physical Sciences 1. Berlin/Heidelberg/New York: Springer-Verlag.
- Toomer, Gerald J., ed. 1984. *Ptolemy's Almagest*. Duckworth Classical, Medieval and Renaissance Editions. London: Duckworth. Reprinted 1998, with foreword by Owen Gingerich. Princeton: Princeton University Press.
- van Gent, Robert. *Almagest Ephemeris Calculator*. [http://www.staff.science.uu.nl/~gent0113/astro/almagestephemeris\\_main.htm](http://www.staff.science.uu.nl/~gent0113/astro/almagestephemeris_main.htm)
- Warnon, Jean. 1967. "Le commentaire attribué à Héliodore sur les εἰσαγωγικά de Paul d'Alexandrie." *Travaux de la Faculté de Philosophie et Lettres de l'Université Catholique de Louvain* 2. Section de Philologie classique 1. *Recherches de philologie et de linguistique*: 197-217.
- Westerink, L. G. 1971. "Ein astrologisches Kolleg aus dem Jahre 564." *Byzantinische Zeitschrift*, 64: 6-21
- ISAW Papers (ISSN 2164-1471) is a publication of the Institute for the Study of the Ancient World, New York University. This article was suggested for publication by Alexander Jones as a member of the ISAW faculty.*

©2017 Dorian Greenbaum and Alexander Jones. Distributed under the terms of the [Creative Commons Attribution 4.0 International license](https://creativecommons.org/licenses/by/4.0/). Additional rights holders and licenses for figures noted in captions as necessary.