

Greek Stars and Chaldaean Hours: A Bouquet of Aratean Emendations from Franz Boll's Library

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A SERIES OF HANDWRITTEN NOTES by Franz Boll (1867–1924)¹ is published here for the first time. These shed new light both on their author's philological and historical work and on the history of the Aratean corpus.² Franz Boll was one of the most prominent figures of *Altertumswissenschaften* in the first quarter of the twentieth century. The main focus of his prolific research activity was ancient astronomy, especially the history of the constellations and of astrology. After a stellar career in Munich (Ph.D. 1894, Director of the manuscript department of the Staatsbibliothek 1898) and Würzburg (Professor of Classical Philology 1903), he be-

¹ On Franz Boll's life and work see H. Gärtner, "‘Finsternisse’ und die Heidelberger klassische Philologie: Franz Boll," in H. Köhler et al. (eds.), "Stürmend auf finsternem Pfad..." *Ein Symposium zur Sonnenfinsternis in der Antike* (Heidelberg 2000) 83–98 (with further bibliography); V. Gysembergh, "Die Kalendergötter des Eudoxos von Knidos," *Antike Naturwissenschaft und ihre Rezeption* 25 (2015) 37–54.

² By Aratean corpus, I refer to the corpus of introductions, commentaries, and scholia to the *Phaenomena*, the hexametric poem written in the third century BCE by Aratus of Soloi and based on Eudoxus of Cnidus' (fourth century) description of the heavens. One should bear in mind that the *Phaenomena* was one of the most widely read Greek astronomical texts through all of Antiquity and the Middle Ages. Therefore, the poem and its exegetical corpus fully deserve to be included in the history of astronomy even though their content is scientifically far less advanced than Ptolemy's *Almagest* or other such texts. Furthermore, they are often an interesting source of information on major astronomers like Eudoxus, Eratosthenes, Hipparchus, etc.

came Professor of Greek in Heidelberg in 1908, and occupied this position until his early death, even declining a call to be the successor of Hermann Diels in Berlin. Yet he is seldom recalled as one of the founding fathers of the history of the ancient celestial sciences; some key factors in this may be his lack of interest in the mathematical aspects that later became central to the historiography of ancient astronomy, and his focus on philological-linguistic study rather than the literary approach that gained prominence in classical scholarship in the later twentieth century.

The library of the Seminar für klassische Philologie at Heidelberg University houses an exemplar of E. Maass' *Commentariorum in Aratum reliquiae* (1898) annotated by Franz Boll (call number Cb 12/550).³ The book has Boll's ex-libris, and Boll's hand can be identified with absolute certainty by comparison with his correspondence kept at the Universitätsbibliothek and with his personal exemplar of his book *Sphaera*.⁴ The numerous annotations are of varied content, and often antiquated, but the notes on matters of textual criticism, coming from such an authority, will be of interest for the establishment and interpretation of the Aratean corpus as well as for the history of scholarship. The emendations recorded by Boll show a classical scholar of the early twentieth century at work on a set of difficult texts. They consistently improve the received text, and showcase his knowledge of current work in both Classics and Assyriology. Boll's only shortcoming in this regard is his failure to use Wieck's 1897 dissertation on the Empedoclean *Sphaera*, which renders some of his own efforts unnecessary (see nos. 5 and 7 below).

In each entry below, the text commented upon by Boll is first

³ Boll published a review of Maass' book in *BZ* 11 (1902) 135–139; the review does not make use of the notes published here.

⁴ Some of Boll's notes in his exemplar of *Sphaera* are published in Gysembergh, *Antike Naturwissenschaft und ihre Rezeption* 25 (2015) 37–54; at the present author's request the entire book was scanned and made available online (<http://digi.ub.uni-heidelberg.de/diglit/boll1903>).

given in its current form according to the standard edition, then in Boll's emended form where this is relevant, with its modifications underscored. There follows an English translation (of the emended text when there is one). Then Boll's remarks are printed, along with the necessary elucidations and examinations. The entries follow the order of Maass' book.

1 Maass p.9 = Hipparchus *Commentary on Eudoxus and Aratus' Phaenomena* p.60 Manitius

Current text (Manitius): οἱ γὰρ ἐν τῷ ἀριστερῷ ποδὶ τοῦ Περσέως δύο λαμπροὶ καὶ ἔτι <ὁ> [οἱ Maass] ἐν τῇ ἀριστερᾷ κνήμῃ πολλῶ ἐγγιόνες εἰσι τῶν Πλειάδων ἤπερ τὸ ἀριστερὸν γόνυ.

The two bright ones (sc. stars) on Perseus' left foot and also <the one> on his right shin are much closer to the Pleiades than his right knee.

Boll, at fr.12 line 11: "οἱ ist falsch, es gibt an der Stelle nur *einen* Stern."

Commentary: Maass supplemented οἱ instead of Manitius' ὁ; Boll rightly points out that Manitius' supplement is superior.

2 Maass p.45 = Achilles *On the Universe* ch. 18, §7 Di Maria

Current text (Di Maria): Χαλδαῖοι δὲ περιεργότατοι γενόμενοι ἐτόλμησαν τοῦ ἡλίου τὸν δρόμον καὶ τὰς ὥρας διορίσασθαι· τὴν γὰρ ἐν ταῖς ἰσημερίαις ὥραν αὐτοῦ, καθ' ἣν ἴσως διέρχεται τὸν πόλον, εἰς τριάκοντα ὅρους μερίζουσιν, ὥστε τὸ τριακοστὸν μέρος τῆς ὥρας τῆς ἐν τῇ ἰσημερινῇ ἡμέρᾳ ὅρον λέγεσθαι τοῦ δρόμου τοῦ ἡλίου. λέγουσι δὲ πάλιν ἀνδρὸς πορείαν μῆτε τρέχοντος μῆτε ἡρέμα βαδίζοντος μῆτε γέροντος μῆτε παιδὸς τὴν πορείαν εἶναι τοῦ ἡλίου καὶ τριάκοντα σταδίων καθαρῶν εἶναι.

Emended text: Χαλδαῖοι δὲ περιεργότατοι γενόμενοι ἐτόλμησαν τοῦ ἡλίου τὸν δρόμον καθ' ὥρας διορίσασθαι· τὴν γὰρ ἐν ταῖς ἰσημερίαις ὥραν αὐτοῦ, καθ' ἣν ἴσως διέρχεται τὸν πόλον, εἰς τριάκοντα ὅρους μερίζουσιν, ὥστε τὸ τριακοστὸν μέρος τῆς ὥρας τῆς ἐν τῇ ἰσημερινῇ ἡμέρᾳ ὅρον λέγεσθαι τοῦ δρόμου τοῦ ἡλίου. λέγουσι δὲ πάλιν ἀνδρὸς πορείαν μῆτε τρέχοντος μῆτε ἡρέμα βαδίζοντος μῆτε γέροντος μῆτε παιδὸς τὴν πορείαν εἶναι τοῦ ἡλίου καὶ τριάκοντα σταδίων καθ' ὥραν εἶναι.

καθ' ὥρας Billfinger | καθ' ὥραν Billfinger

The Chaldaeans, having become most inquisitive, were so bold as to split the sun's course into double-hours: indeed they divide its equinoctial hour, according to which it crosses the sky at constant speed, into thirty measures, so that the thirtieth part of the equinoctial hour is called a measure of the sun's course. Again, they say that the sun's journey is the journey of a man who is neither running nor walking slowly, and not of an old man or a child, and that it comprises thirty stades per hour.

Boll (in the lower margin, as a supplementary critical apparatus): “2 καὶ τὰς: καθ’ Bilfinger (Die babylonische Doppelstunde, Stuttg. 1888) 8 καθαρῶν: καθ’ ὥραν Bilf.”

Commentary: The first conjecture introduces a reference to the time unit *bēru*, “double-hour” (in *Boll*'s time erroneously read *kasbu*), instead of the absurd claim that the “Chaldaeans” were so bold as to divide the sun's course and the hours.⁵ The second conjecture replaces the strange notion of a “pure stadion” with the correspondance, well known from the Sumerian-Babylonian weight and length systems, between one *bēru* and 30 UŠ, here rendered as 1 ὥρα = 30 στάδια.⁶ The text thus exhibits a striking familiarity with Near Eastern metrology, as neither this correspondance nor the equivalence 1 ὥρος = 1 στάδιον = 1° seem to be documented elsewhere in Greek texts.⁷ The comparison of the sun's course with “the journey of a man” could be derived from the *Epic of Gilgamesh*, Tablet 9, where Gilgamesh travels twelve *bēru* along the course of the

⁵ For other instances of ὥρα with the meaning “double-hour” see F. *Boll*, *Sphaera* (Berlin 1903) 311–313 and 335, and W. Hübner, “Zwei griechische Texte über die Tages- und Stundenherrscher,” *ZPE* 49 (1982) 53–66, here 64.

⁶ See M. A. Powell, “Maße und Gewichte,” in *Reallexikon der Assyriologie* 7 (1987) 457–530, here 465–468; F. Rochberg-Halton, “Babylonian Seasonal Hours,” *Centaurus* 32 (1989) 146–170, here 147–150.

⁷ On stadion as a name of the double-hour see e.g. C. Manitius, *Hipparchi in Arati...* (Lepizig 1894) 274 ff., with O. Neugebauer, “Some Fundamental Concepts of Ancient Astronomy,” in E. A. Speiser et al. (eds.), *Studies in the History of Science* (Philadelphia 1941) 13–29, here 17 (repr. O. Neugebauer, *Astronomy and History. Selected Essays* [New York 1983] 5–21).

sun.⁸ It also reflects the fact that the *bēru* is not only a unit of time, but also one of length.

Boll's recollection of Gustav Billfinger's palmary conjectures,⁹ which have been neglected not only by Maass but also by the subsequent editor Giorgio Di Maria, and indeed by a great number of classical scholars, is a tribute to his remarkable knowledge of contemporary Assyriology, due in part to his friendship and collaboration with Carl Bezold, one of the pioneers in the study of ancient Near Eastern astronomy.¹⁰ In this regard, it is not inappropriate to report the (hitherto unrecorded) dedication in a book given by Boll to his friend and colleague (*Arati Phaenomena et Diosemea* ed. Philippus Buttmannus [1826], kept in the Heidelberg Institut für Assyriologie under call number Cn 10):

Τῷ ἐμῷ Βεζολδίῳ ἄστρα διακρίναντι Χαλδαίων 4.X.13 Βόλλιος
To my dear Bezold, who has told apart the constellations of the
Chaldaeans, 4.X.13, Boll.¹¹

3 Maass p.104 = “Anonymus II,” Introduction to Aratus’
Phaenomena ch. 3 Maass

Current text (Maass): ὁ δὲ χειμερινὸς τροπικὸς πλεῖον ἔχει τὸ ὑπὸ γῆν, ἦσσον δὲ τὸ ὑπὲρ γῆν, ἐφ’ ᾧ κατεστήρικται ζώδια ζ’, Ἡριδανὸς Ἀργὼ Κένταυρος, ἐφ’ ᾧ Θηρίον, Θυτήριον Ἰχθὺς μέγας νότιος ἀφανής.

Emended text: ὁ δὲ χειμερινὸς τροπικὸς πλεῖον ἔχει τὸ ὑπὸ γῆν, ἦσσον δὲ τὸ ὑπὲρ γῆν, ἐφ’ ᾧ κατεστήρικται ζώδια ζ’, Ἡριδανὸς Ἀργὼ Κένταυρος, ἐφ’ ᾧ Θηρίον, Θυτήριον Ἰχθὺς μέγας

⁸ Ed. A. R. George, *The Babylonian Gilgamesh Epic* (London 2003); German transl. (based in part on unpublished cuneiform texts) S. M. Maul, *Das Gilgamesch-Epos* (Munich 2005).

⁹ G. Billfinger, *Die babylonische Doppelstunde: eine chronologische Untersuchung* (Gymnasialprogr. Stuttgart 1888) 21–22.

¹⁰ It was Bezold who provided Boll with Billfinger's rare *Gymnasialprogramm*, see Boll, *Sphaera* 312 n.3.

¹¹ The book also bears two notations of ownership:
“Ex libris C. Bezold, Heidelberg, 4.10.13”
“W. Schady Bonn 1868”

Νότιος Στέφανος.

Στέφανος Rehm

A bigger part of the winter tropic is below the earth, and a smaller part of it is above it; on it six constellations are marked out: Eridanus, Argo, the Centaur upon which is the Beast, the Altar, the big Fish, and the Southern Crown.

Boll, at l. 19, with regard to ἀφανής: “στέφανος Rehm”

Commentary: *Boll* reports an unpublished conjecture by Albert Rehm (1871–1949). The sequence of three adjectives μέγας νότιος ἀφανής is redundant, as Ἰχθύς μέγας was a common denomination of Piscis Austrinus, cf. (ps.?)-Eratosthenes *Catast.* 38 (ed. Pàmias-Zucker): ὁ μέγας καλούμενος Ἰχθύς, ὃν κάπτειν λέγουσι τὸ ὕδωρ ἀπὸ τῆς τοῦ Ὑδροχόου ἐκχύσεως, “the Fish that is called big, who they say gulps down the water poured out by Aquarius.” ἀφανής is a rather heavy, but plausible corruption of στέφανος, so one should accept Rehm’s conjecture, which restores the count of six constellations (assuming that the relative clause ἐφ’ ᾧ Θηρίον is not part of the six). However, it should be noted that this description of the tropic is inaccurate, like other descriptions of celestial circles in the text: the first four constellations, including Θηρίον/Lupus, are indeed on the tropic of Capricorn, but Θυτήριον/Ara, Ἰχθύς μέγας/Piscis Austrinus, and Νότιος Στέφανος/Corona Australis are much farther south.

4 Maass p.156 = [Emped.] *Sphaera* line 23

Current text (Maass): Ἐριφοὶ δὲ ταύτης νέρθεν εἴληχαν τόπον.

Emended text: Ἐριφοὶ δὲ ταύτης νέρθεν εἴληχεν τόπον.

Haedi have their place below it (sc. Capella).

Boll, with regard to “23 Ἐριφος – εἴληχεν libri” in the critical apparatus: “richtig.”

Commentary: *Boll* rightly rejects the form εἴληχαν, which is grammatically incorrect, for εἴληχεν, which is attested in all manuscripts (*libri*).

5 Maass p.158–160 = [Emped.] *Sphaera* lines 53–56

Current text (Maass): ἐμπροσθίον δὲ Τοξότου χεροῖν ὑπο / δινω-
τὸς ἄστρον Κύκλος ἀμφελίσσεται / [ἐνθένδε δ’ ἄλλος κύκλος,

ὅς κικλήσκειται] / ὁ νότιος Ἰχθύς τ' ἄλλος ἐσθ' ὀρώμενος.

Emended text: ἐμπροσθίον δὲ Τοξότου χεροῖν ὑπο / δινωτὸς ἄστρον Κύκλος ἀμφελίσσεται. / ἐνθένδε δ' ἄλλος κύκλος, ὅς κικλήσκειται / ὁ νότιος, Ἰχθύς τ' ἄλλος ἐσθ' ὀρώμενος.

Beneath the forelegs of Sagittarius spins a swirling circle of stars.

Hence is another circle, which is called the Southern one, and another Fish (sc. Piscis Austrinus) is visible.

Boll, after p.160 line 55: “Lücke?”

Commentary: Boll suspects a lacuna after line 55, which Maass had athetized. He may have been disturbed by the enjambment at the end of line 55. However, no intervention in the received text seems necessary, as Wieck has explained the meaning of these lines in his dissertation.¹² The δινωτὸς ἄστρον κύκλος is in fact Corona Borealis, described in similar terms by Aratus (400–401), and νότιος κύκλος is an accepted denomination of the antarctic circle (see e.g. “Anonymus II,” Introduction to Aratus’ *Phaenomena* ch. 2 Maass p.103: ἀνταρκτικὸν δὲ ἐν τῷ ἀφανεῖ, τὸν καὶ νότιον λεγόμενον, “the antarctic circle in the invisible part of the sky, which is also called the southern circle”).

6 Maass p.160 = [Emped.] *Sphaera* lines 72–73

Current text (Maass): Κριός θ' ὑπ' αὐτὸν Ἰχθύων τε σώματα / παρ' οὓς ἰκνεῖται Κῆτος.

Aries is below it (sc. Taurus), as are the Pisces' bodies, next to which comes Cetus.

Boll: “falsch.”

Commentary: Boll, noting that neither Aries nor Pisces can be said to be “under” Taurus, condemns the received text but does not offer an emendation. Perhaps he considered the text to be correct, but its content to be false.

7 Maass p.166 = [Emped.] *Sphaera* lines 132–136

Current text (Maass): μεθ' ὃν κύκλου φοραῖσι ταῖς πολυ-

¹² F. Wieck, *Sphaeram Empedoclis quae dicitur recensuit et dissertationem adjecit* (Leipzig 1897) xxi.

στρόφοις / εὔσημος οὐκ ἄσημός ἐστι Τοξότης / (ἐκ γῆς γὰρ ἤδη καρπὸς ἐκτοξεύεται) / τὰ νέρθε δεικνὺς γαστρὸς οὐ κεκρυμμένα / νέοις θ' ὑπερθε φύεται κεντρίσμασιν.

Emended text: μεθ' ὃν κύκλου φοραῖσι ταῖς πολυστρόφοις / εὔσημος οὐκ ἄσημός ἐστι Τοξότης, / (135) τὰ νέρθε δεικνὺς γαστρὸς οὐ κεκρυμμένα· / (134) ἐκ γῆς γὰρ ὡσπερ καρπὸς ἐκτοξεύεται / νέοις θ' ὑπερθε φύεται κεντρίσμασιν.

v. 135 ante v. 134 transp. Wieck || 134 ὡσπερ [*velut* Lat.]

Wieck in app. || 136 θ' [*et* Lat.] Wieck: γὰρ codd.

After him (sc. Scorpio), with the winding revolutions of a circle (sc. Corona Australis), there is Sagittarius, not obscure but conspicuous, who shows without conceit what is beneath his stomach; for from the earth, he shoots out like fruit, and grows above the new shoots.

Boll, at line 136: “γὰρ” (instead of θ’).

Commentary: *Boll* prefers the received Greek text to Maass’ restitution from the Latin version. The substitution of an anapest for an iamb in the second foot is acceptable in the didactic iambic tradition. As in no. 5 above, *Boll* does not seem to have read Wieck’s dissertation, in which lines 134 and 135 are transposed. Indeed, as noted by Wieck, κύκλου φοραῖσι ταῖς πολυστρόφοις refers to Corona Australis, which can be said to be underneath the stomach of Sagittarius. As they stand in the Greek text, lines 134–136 do not make much sense, but the Latin version suggests their probable meaning: *a terra autem fructus velut sagittae mittitur / novasque desuper germine insertas*. In Greek, these lines end on a remarkable (but seemingly unnoticed) pun, with κέντρισμα literally referring to plant shoots, but alluding both to the arrows shot by Sagittarius and to his frequent depiction as a centaur.

8 Maass pp.310–311 = Anonymous *Excerptum de astrologia Arati* pp.44–45 Dell’Era

Boll copies a selection of variants from the MS. Munich, Bayerische Staatsbibliothek, *Clm* 210. This manuscript is used in Antonio Dell’Era’s standard edition of the *Excerptum de*

astrologia Arati.¹³ It had in fact been known as a witness to the *Excerptum* since 1888, when K. Rueck drew attention to it.¹⁴ Its contents were also described in Meyer and Riezler's catalogue of Latin manuscripts in the Bayerische Staatsbibliothek.¹⁵ Hence, it is surprising that Maass, despite quoting Rueck's *Schulprogramm* in his apparatus, did not use this manuscript: his edition is indeed "un notevole passo indietro."¹⁶ It would be interesting to know whether Boll collated the manuscript while he was still in Munich or on a later occasion.

9 Maass p.318 = *Isagoga bis excerpta* §14 = Martin, *Scholia* pp.26–27

Text (Maass): καὶ τῶν μὲν ἀπλανῶν τῶν σὺν τῷ παντὶ περι-
αγομένων τὰ μὲν ἀκατονόμαστα ἡμῖν καὶ ἀπερίληπτα, ὡς καὶ
Παρμενίδης ὁ φυσικὸς εἶρηκε, τὰ δὲ κατωνομασμένα ὡς ἐκ τοῦ
μεγέθους χίλια εἰσι κατὰ τὸν Ἄρατον.

Emended text: καὶ τῶν μὲν ἀπλανῶν τῶν σὺν τῷ παντὶ περι-
αγομένων τὰ μὲν ἀκατονόμαστα ἡμῖν καὶ ἀπερίληπτα, ὡς καὶ
Παρμενίδης ὁ φυσικὸς εἶρηκε, τὰ δὲ κατωνομασμένα ἕως
ἕκτου μεγέθους χίλια εἰσι κατὰ τὸν Ἄρατον.

ἕως ἕκτου μεγέθους Diels

And among the fixed stars which revolve with the universe, some are neither named nor perceived by us, as the physicist Parmenides also said, whereas the others, down to the sixth magnitude, are a thousand according to Aratus.

Boll, at line 18 regarding ὡς ἐκ τοῦ μεγέθους: "ἕως ἕκτου μεγέθους richtig Diels Hermes XXXV 200."

Commentary: Boll recalls the correct emendation by Hermann Diels, who noted that the text in MS. Paris, *BNF Suppl.gr.* 607A,

¹³ A. Dell'Era, *Una caeli descriptio d'età carolingia* (Palermo 1974) 43–46.

¹⁴ K. Rueck, *Auszüge aus der Naturgeschichte des C. Plinius Secundus in einem astronomisch-komputistischem Sammelwerke des achten Jahrhunderts* (Munich 1888) 5–10.

¹⁵ G. Meyer and S. Riezler, *Catalogus codicum latinorum bibliothecae regiae Monacensis* (Munich 1892).

¹⁶ A. Dell'Era, *Una caeli descriptio* 8.

is in fact ἕως ἐκ τοῦ μεγέθους, so that his emendation does not require the insertion of an ε.¹⁷ The actual source is not Aratus but Ptolemy, as suggested by Diels; Ptolemy's catalogue in *Almagest* 7–8 has 1028 stars.¹⁸

10 Maass, pp.324–333 (= Vita IV, pp.19–21 Martin) +
Excerpta varia pp.535–544

Boll collates MS. Heidelberg, *Palat.gr.* 40 f. 111^v and f. 101^r. This manuscript has since been used by J. Martin in his edition of Vita IV, but not for the *Excerpta varia*. *Boll*'s collations show that he understood the eventful history of its Aratean section, as described by Martin.¹⁹

The text of the *Excerpta varia* in H is closest to MS. M (= Venice, *Marc.gr.* 476). One should note the following original readings:

538.9 ἀρότων: ἀροτήρων H

543.3–4 πᾶσαι – ἴσαι: ἕκασται εὐθεῖαι πᾶσαι ἀλλήλαις ἴσαι H

544.9–10 ἄγεται ὁ οὐρανός Martin: habet H, cf. ὁ οὐρανός ἄγεται Est. (showing that H does not descend from M, which has λέγεται ὁ οὐρανός)²⁰

11 Maass p.360 = schol. Arat. *Phaen.* 127

Current text (Maass; not printed by Martin):²¹ αἱ διαφοραὶ τῶν λέξεων παριστῶσι τὰς κακίας τῶν ἀνθρώπων.

Emended text: αἱ διαφοραὶ τῶν μετάλλων παριστῶσι τὰς κακίας τῶν ἀνθρώπων.

μετάλλων *Boll*

The differences in metal show the evils of men.

¹⁷ H. Diels, "Parmenidea," *Hermes* 35 (1900) 196–201, here 200.

¹⁸ Cf. B. E. Schaefer, "The Thousand Star Magnitudes in the Catalogues of Ptolemy, Al Sufi and Tycho are All Corrected for Atmospheric Extinction," *Journal for the History of Astronomy* 44 (2013) 47–74 and A75–A91, here 47.

¹⁹ J. Martin, *Aratos. Phénomènes I* (Paris 2000) CLXIX–CLXXIII.

²⁰ That H is not a direct descendant of M was recognized as likely by Martin after his edition of the scholia: *Aratos. Phénomènes I* CLXXII.

²¹ J. Martin, *Scholia in Aratum vetera* (Leipzig 1975), leaves out the scholia that he considers devoid of any content originating from Antiquity.

Boll, at line 10, regarding διαφοραὶ τῶν λέξεων: “μετάλλων?”

Commentary: Boll tentatively suggests emending λέξεων to μετάλλων. In lines 96–136 Aratos is rewriting the Hesiodic myth of the five ages of mankind (the golden, silver, bronze, heroic, and iron ages). This is the basis for Boll’s conjecture. Although the corruption from μετάλλων to λέξεων is difficult to explain, Boll’s conjecture is, at any rate, more satisfactory than the received text.

12 Maass, pp.382–383 = schol. Arat. *Phaen.* 242

Current text (Martin): προείπομεν γὰρ ὅτι πρὸς τὸν ὦμον Ἄνδρομέδας <ὁ βορειότερος> Ἰχθύς μόνην τὴν οὐρὰν ἔχων ἐπὶ τῷ ζῳδιακῷ κεῖται, <καὶ> τοῦ ἑτέρου, τοῦ ἀφορῶντος πρὸς τὸν Κριόν, οὐραίοις ἐπιψαύει. τοῦτον τοίνυν τὸν βορειότερον Ἰχθύν χελιδόνος ἔχειν τὴν κεφαλὴν φασιν, ὃν Χαλδαῖοι καλοῦσι χελιδονίαν ἰχθύν. τὸ μέντοι σῶμα πλὴν τῆς κεφαλῆς.

Emended text: προείπομεν γὰρ ὅτι πρὸς τὸν ὦμον Ἄνδρομέδας Ἰχθύς μόνην τὴν οὐρὰν ἔχων ἐπὶ τῷ ζῳδιακῷ κεῖται, τοῦ ἑτέρου, τοῦ ἀφορῶντος πρὸς τὸν Ὑδροχόον, οὐραίοις ἐπιψαύοντος. τοῦτον τοίνυν τὸν νοτιώτερον Ἰχθύν χελιδόνος ἔχειν τὴν κεφαλὴν φασιν, ὃν Χαλδαῖοι καλοῦσι χελιδονίαν ἰχθύν, τὸ μέντοι σῶμα <ἰχθύος> πλὴν τῆς κεφαλῆς.

Ὑδροχόον vel Ἴππον Boll: Κριόν codd. | οὐραίοις Martin: οὐραίαις M, alii alia | ἐπιψαύοντος scripsi: ἐπιψαύει MKVU, om. alii | νοτιώτερον scripsi: βορειότερον codd. | ἰχθύος add. Boll

We said before that near Andromeda’s shoulder lies a Fish, with only its tail on the zodiac, while the other one, which looks away towards Aquarius, grazes it with its tail-parts. They say this southern Fish has the head of a swallow, and the Chaldaeans call it swallow-fish (that is, the body of the fish without its head).

Boll, at p.382 line 27, regarding Κριόν: “falsch: ὕδροχόον oder ἵππον.” At p.383 line 2, after σῶμα: “<ἰχθύος>.”

Commentary: Regarding Κριόν, Boll repeats a suggestion he had made in his *Sphaera* (71 n.3). Indeed, as emphasized by Martin in his heavy-handed addition, the first fish mentioned must be the northern one, since it is near Andromeda’s shoulder and has its tail on the zodiac; therefore, the second fish, with its tail

parts grazing the zodiac, must be the southern one. The southern fish does not face Aries and must have been said to face Aquarius or Pegasus. Thus, in his own logic, Martin should have accepted Boll's conjecture, had he been aware of it. After σῶμα Boll inserts ἰχθύος, which yields satisfactory sense if τὸ μέντοι – κεφαλῆς is construed as a restriction to ὄν – ἰχθύον.

The interesting reference to the Chaldaeans is accurate to the extent that the Babylonian constellation “Great Swallow” (ŠIM.MAH) corresponded more or less to the southernmost Fish.²² Hence the present author's further emendation νοτιώτερον.²³ It is also necessary to change ἐπιψαύει into ἐπιψαύοντος (genitive absolute), because it is the southernmost Fish whose tail-parts (ε Psc) graze the ecliptic.

13 Maass p.390 = D-schol. *Il.* 18.486 Z^s(c) van Thiel, lines 31–36

Current text (van Thiel): Πλειάδων δὲ ἀνατολὴ ἑῶα ἡλίου ὄντος ἐν Διδύμοις, δύσις δὲ ἑῶα κατὰ τὴν διάμετρον ἡλίου ὄντος ἐν Σκορπίῳ. Ταύρου δὲ ὄντος ἡλίου κατὰ τὸ εἰκὸς ἐκατέρωθι ἐπίφασις γίγνεται. καὶ γὰρ τὸν προανατέλλοντα Κριὸν ἐπὶ πέντε ἡμέρας προκαταλάμπει καταρχὰς ἐγγὺς ὦν αὐτοῦ, καὶ τοὺς προανατέλλοντας Διδύμους ἐπ' ἄλλας ἡμέρας πέντε, ὥσπερ τὸ ἔν τινι καιόμενον πῦρ θέρμης ἀπόρροιαν ἔχει βραχεῖαν καὶ πρὸς τοὺς ἐκατέρωθεν. διὰ τοῦτο καὶ Ἡσίοδος ἔφη· “αἰ δὴ τοι νύκτας τε καὶ ἡμέρας τεσσαράκοντα κεκρύφαται,” διότι καταυγάζονται.

²² See H. Hunger and D. Pingree, *Astral Sciences in Mesopotamia* (Leiden 1999) 276. See also W. Hübner, *Manilius, Astronomica, Buch V* (2010) II 318 und 362–363, on Manil. 5.633 *volabit*: the swallow-fish accounts for winged Pegasus as a paranatellon of Pisces.

²³ On the contrary, Boll held that the “swallow-fish” was the northern one, on the strength of *P.Lond.* I 130.104–106: F. Boll, “Sternbilder, Stern-glaube und Sternsymbolik bei den Griechen und Römern,” in Roscher 6.867–1071, here 979. This was also the opinion of O. Neugebauer and H. B. van Hoesen, *Greek Horoscopes* (Philadelphia 1959) 26–27.

Emended text: Πλειάδων δὲ ἀνατολὴ ἑώρα ἡλίου ὄντος ἐν Διδύμοις, δύσις δὲ ἑώρα κατὰ τὴν διάμετρον ἡλίου ὄντος ἐν Σκορπίῳ. <ἐν> Ταύρω δὲ ὄντος ἡλίου κατὰ τὸ εἰκὸς ἑκατέρωθι ἀπόφασις γίνεται. Καὶ γὰρ τὸν προανατέλλοντα Κριὸν ἐπὶ πέντε ἡμέρας προκαταλάμπει καταρχὰς ἐγγύς ὦν αὐτοῦ, καὶ τοὺς ἐπανατέλλοντας Διδύμους ἐπ’ ἄλλας ἡμέρας πέντε, ὥσπερ τὸ ἐν τινι καίομενον πῦρ θερμῆς ἀπόρροϊαν ἔχει βραχεῖαν καὶ πρὸς τοὺς ἑκατέρωθεν. διὰ τοῦτο καὶ Ἡσίοδος ἔφη· “αἰ δὴ τοι νύκτας τε καὶ ἡμέρας τεσσαράκοντα κεκρύφαται,” διότι καταυγάζονται.

ἐν add. Maass || ἀπόφασις scripsi || ἐπανατέλλοντας Boll

The Pleiades have their dawn rising when the sun is in Gemini, and their dawn setting when it is in opposition in Scorpio. When the sun is in Taurus, in all likelihood there occurs a disappearance on both sides. Indeed, at the start it sheds light ahead of Aries, which rises first, for five days, being close to it (sc. Aries), and it sheds light ahead of Gemini, which rises afterwards, for another five days, just as fire burning inside something has a short exhalation of heat on both sides. That is also why Hesiod said: “They [sc. the Pleiades] are hidden during forty nights and days” [*Op.* 385–386], because they are outshone.

Boll, at p.390, l. 23, regarding προανατέλλοντας: “ἐπανα?”

Commentary: The general meaning of this passage is that the interval of forty days when the Pleiades vanish from the night sky is centered on the thirty-day month when the Sun is in Taurus, with the ten other days evenly split between Aries and Gemini. Boll’s emendation reflects this symmetry, as in fact Gemini has its heliacal rising not before but after Taurus. A further emendation ἀπόφασις (for ἐπίφασις) seems necessary, because the text is referring to the period of approximately forty days every year when the Pleiades are not visible in the night sky of Greece; although ἐπίφασις is not a very common word, it does appear over fifty times in the TLG corpus, and corruption of ἀπο- to ἐπι- is liable to occur in minuscule script, so that in the present case, *lectio difficilior* is not necessarily *melior*.

14 Maass p.418 = schol. Arat. *Phaen.* 400

Current text (Martin): ἀστέρων δέ ἐστι ιθ'.

Emended text: ἀστέρων δέ ἐστι θ'.

θ' Boll

It (sc. Corona Australis) is made up of nine stars.

Boll, at line 9: “θ' (soviele 4. und 5. Größe bei Ptolem.)”

Commentary: Boll refers to the number of stars in Corona Australis according to Ptolemy's star catalogue, applying the same rationale as above in no. 9. The conjecture here is tempting, and should be accepted, because the supposed cause of error (misdivision) is quite plausible. However, the method cannot be applied mechanically: see e.g. the scholia to 403, where Ara is said to contain four stars (as against eight in Ptolemy's catalogue).

15 Maass pp.568–570 = (ps.?)-Leontius Mechanicus *De zodiaco* pp.529–531.19 (ἐξήκοντα) Martin

Boll collates MS. H (as in no. 10 above) f. 101^r. Martin did not use H in his edition. The text of *De zodiaco* in H has several original readings, and, while closest to MS. M, it sides against it with the other manuscripts at 529.1:

529.1 ὅτι M: om. KCAPBH

529.1 διὰ δύο αἰτίας καλεῖται ζωδιακός: ζωδιακός καλεῖται διὰ δύο αἰτίας H

529.6 οὔτε ἀρχὴν οὔτε τέλος: ἀρχὴν οὐδὲ τέλος H

529.7 τοῦ κύκλου σχῆμα: τὸν κύκλον H

531.18 περιέχουσα ante δέκα habet H

16 Maass p.602

Current text (Maass): Serpentarius dicitur Arciepius (*legas* Asclepius) medicus. – [Scorpio dum oritur, mortalitas ginnitur.]

Emended text: Serpentarius dicitur Arciepius (*legas* Asclepius) medicus. – Scorpio dum oritur, mortalitas ginnitur.

Serpentarius is said to be Arciepius (read: Asclepius) the doctor.

When Scorpio is rising, mortality (sc. Hades) is born.

Boll, regarding line 4 *mortalitas ginnitur*: “ginnitur also *Hades!*”

Commentary: The astronomical embroiderings edited by Maass on pp.602–603 are from the so-called Star mantle of Holy

Roman emperor Henry II (r. 1014–1024), now housed in the Diözesanmuseum in Bamberg. They consist of depictions of constellations with a few words of explanation. Maass had found that these inscriptions mostly summarized the so-called *Recensio interpolata* of Aratus, which he edited at pp.180 ff. However, he athetized the inscription concerning Scorpio, probably because he could not understand the statement *mortalitas ginnitur*. Boll recognizes that *mortalitas* is in some way a rendering of Ἅιδης (Hades), the god of the underworld who was regularly associated with Scorpio in astrology. This explanation opens the way to restoring the sentence as authentic. The fact that the *Recensio interpolata* does not refer to the association of Scorpio with Hades is not a problem: the same is true of the association of Ἴππος (Pegasus) with the Muses, included on the mantle (p.602 line 10) but not in the *Recensio interpolata*. This only confirms that the text used as a source for the astronomical embroiderings was not exactly the one we know as the *Recensio interpolata*.

R. Baumgärtel-Fleischmann has shown that the astronomical inscriptions on this mantle were heavily restored in the fifteenth century.²⁴ The sole exception is the inscription concerning Cancer, which is preserved largely in its original form.²⁵ The Cancer inscription has mainly astrological content: HOC SIDUS / CANCBI / EERT NOC/IVA MUND/DI (read: *hoc sidus cancri fert nociva mundi*), “This constellation of Cancer bears the harmful things of the world.” It is followed by this sensible piece of advice: ASTROLOGUS HIC SIT CAUTUS, “Let the astronomer/astrologer be cautious here.” Baumgärtel-Fleischmann hypothesizes that only the Cancer inscription reflects the original text, whereas all other astronomical inscriptions were modified because of their exceedingly astrological content. Her hypothesis seems less convincing now, since the astrological

²⁴ R. Baumgärtel-Fleischmann, “Der Sternenmantel Kaiser Heinrichs II. und seine Inschriften,” in W. Koch (ed.), *Epigraphik 1988. Fachtagung für mittelalterliche und neuzeitliche Epigraphik* (Vienna 1990) 105–125.

²⁵ Baumgärtel-Fleischmann, in *Epigraphik 1988* 114 and 117.

sense of the Scorpio inscription is clear: perhaps the restored astronomical inscriptions do reflect the original text after all.

17 Various *crucis*

Finally, Boll marked several problematic passages with question marks; these are recorded here as enticements for philologists of today and tomorrow:

46.1–3; 154.2–4; 154.9 (ποσὶν); 162.85 (συνῆλθε);²⁶
 166.125; 166.144 (ταὐτὸν); 367.1–2; 373.5 (ἴση
 εὐθειᾶ); 374.4–5; 430, 2 (τῶν ἀπλανῶν).²⁷

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²⁶ Obviously at a later time, Boll wrote next to this word: “stoisch?”

²⁷ My thanks go to Klaus Geus for his comments on a draft of this paper. I am also indebted to an anonymous reviewer of *GRBS* for his/her suggestions.