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NOTE: BOETHUS FR. 44 RASHED

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The Arabic text of Boethus fr. 44 Rashed[1] has, pace Rashed (p. 266), a parallel in a Greek scholium to Galen's *De elementis ex Hippocratis sententia*.[2] The scholium occurs in the sets of scholia to *De elem.* in Paris BNF suppl. gr. 634 (= Π; saec. xii) and in El Escorial Φ.II.15 (= Σ; saec. xiii). The former set was edited by G. Helmreich in *Handschriftliche Studien zu Galen*, vol. I.[3] The relevant passage occurs in Π fol. 21 r ult. – v 3 (= schol. 34 p. 12 Helmr.) and in Σ fol. 136 r 7-11. The polysyllogism ascribed to Boethus[4] reads:

τὸ ὅμοιον ὑπὸ τοῦ ὁμοίου γινώσκεται. ἡ αἴσθησις τὰ στοιχεῖα γινώσκει. ἡ αἴσθησις ἄρα ὁμοία τοῖς στοιχείοις … ἡ αἴσθησις ὁμοία τοῖς στοιχείοις. τὸ ὅμοιον ἐκ τοῦ ὁμοίου [γινώσκεται]. ἡ αἴσθησις ἄρα ἐκ τῶν στοιχείων [γινώσκεται].

1 τὸ ὅμοιον ὑπὸ τοῦ ὁμοίου γινώσκεται] = Philop. *In De an.* I 2 p. 86.15-16, I 5 p. 180.2,7-8,31; (sim.) I 2 p. 181.5, I 5 p. 180.20,26, III 2 p. 452.9-10 Hayduck ‖ 3 τὸ ὅμοιον ἐκ τοῦ ὁμοίου] = Porph. *Ad Gaur. quom. anim. fet.* 17.4 p. 59.18; (sim.) 18 p. 62.19 Kalbfleisch; Simpl. *In Phys.* I 2 p. 23.2-3 Diels = Xenoph. A 31(4) DK; Philop. *In Phys.* II 2 p. 240.23, III 4 p. 396.27, 403.14 Vitelli

3 ἐκ] ὑπὸ ΠΣ, correxi ‖ 3,4 γινώσκεται seclusi

[1] Apud *Boéthos de Sidon – Exégète d'Aristote et philosophe*, éd. par R. Chiaradonna et M. Rashed (Berlin, Boston, 2020), p. 75.7-11 = G. Bos and Y. T. Langermann, "An epitome of Galen's On the Elements ascribed to Ḥunayn Ibn Isḥāq," *Arabic sciences and philosophy*, 25 (2015), p. 33-78: 72.12-17.

[2] Briefly commented on by D. Manetti, "P. Berol. 11739A e i commenti tardoantichi a Galeno," in A. Garzya (ed.), *Tradizione e ecdotica dei testi medici tardoantichi e bizantini. Atti del Convegno Internazionale, Anacapri, 29-31 ottobre 1990* (Napoli, 1992), p. 211-235: 220.

[3] *Handschr. Studien zu Galen*, vol. I, "Bruchstücke eines Kommentars zu Galens Schriften Περὶ στοιχείων, Περὶ κράσεων und Περὶ φυσικῶν δυνάμεων" (Ansbach, 1910) ("Programm des K. humanistischen Gymnasiums in Ansbach für das Schuljahr 1909/10"), p. 4-20.

[4] References to Boethus recur in schol. 33 p. 11 Helmr. ≈ Σ fol. 136 r 1 sqq. and in Π fol. 21r in a diagram neither reproduced nor mentioned in Helmreich's edition. In both cases Boethus is conjoined with Empedocles. The diagram is similar to the one found in the Arabic Alexandrian Summary of *De elem.* Cf. *The Alexandrian epitomes of Galen*, vol. 1, "On the medical sects for beginners, The small art of medicine, On the elements according to Hippocrates," ed. J. Walbridge (Provo, 2014), p. 141. Instead of Ἀσκληπιάδης (= *Asqilībiyāḏis*) Π features Ἐμπεδοκλῆς καὶ μᾶλλον Βοηθός.

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The polysyllogism is composed of a sequence of two συλλογισμοί – i. e. two deductively valid arguments. The general form of the sequence is $\phi_1, \phi_2 \vdash \phi_3; \phi_3, \phi_4 \vdash \psi$, where each ϕ_i is a distinct proposition and ψ – also a distinct proposition – is the conclusion the twofold chain of sequents is meant to proof. The two sequents are denoted $\mathfrak{S}_1$ (= $\phi_1, \phi_2 \vdash \phi_3$) and $\mathfrak{S}_2$ (= $\phi_3, \phi_4 \vdash \psi$) in what follows.

The text of ϕ_4 and concomitantly of ψ is corrupt in the Greek tradition. Either ϕ_1 or, else, more analytically, a proper substring thereof (probably ὑπὸ τοῦ ὁμοίου γινώσκεται) must have been carried over from $\mathfrak{S}_1$ to $\mathfrak{S}_2$ (second premise). Subsequently, γινώσκεται was probably added at the end of the genuine ψ in a faulty attempt at restoring validity to the argument. The text of both ϕ_4 and ψ is easily emended on logical grounds by conjecture. The three emendations, viz. twice [γινώσκεται] and the alteration of ὑπὸ into ἐκ are also supported by the evidence gleaned from the Arabic text. Once emended, the transmitted text becomes similar to Rashed's (p. 266 n. 3) Greek retroversion from the Arabic.

The text of fr. 44 must have been partially derived from Philoponus. Excerpts from Philoponus recur throughout Π.[5] Let "$\gamma\iota\nu(x, y)$" = "x γινώσκει y" and also (for the sake of brevity, with the corresponding passive / active transformation) "y γινώσκεται ὑπὸ x"; "$o\mu(x, y)$" = "x ὅμοιος y"; "$\varepsilon\kappa(x, y)$" = "x ἐκ y"; "α" = "ἡ αἴσθησις"; and "σ" = "τὰ στοιχεῖα". The argu-

[5] Schol. 30-32 p. 10-11 Helmr. features an excerpt from Philop. *In De gen. et corr.* I 2 p. 23.2-24 Vitelli (the source was identified by Manetti, "P. Berol. 11739A" p. 220). The passage is glossed εἰς τὸ αὐτὸ ἀπὸ τῆς ἐξηγήσεως τοῦ Φιλοπόνου. None of the excerpts that follow are glossed similarly. Helmreich's annotations to the text are of little help because he is either silent as to the sources of the relevant passages or traces them back only to Aristotle. I see in fact only one reference by Helmreich to CAG, on p. 9 n. 5. (1) Schol. 27 p. 10 Helmr. < Philop. *In De an.* I 2 p. 68.3 sqq., 84.9 sqq. Hayduck; *In De gen. et corr.* I 2 p. 26.8 sqq. Vitelli; *In Phys.* I 5 p. 117.11-13 Vitelli. – On p. 10 l. 1 Helmr. read Ἀβδηρικὰ ὀνόματα instead of ἀνδειρικὰ ὀνόματα as printed by Helmr. dubit. (2) Schol. 29 p. 10 Helmr. < Philop. *In Phys.* I 2 p. 26.1 sqq. Vitelli. (3) Schol. 33 p. 11 Helmr. = Σ fol. 136 r 2-4 < Philop. *In De an.* I 2 p. 73.21 sqq.; I 3 p. 93.3-7; III 2 p. 469.17-20; III 4 p. 516.24-26, 520.4-5, 524.6 sqq., 533.21 sqq. (4) Schol. 40-41 p. 14 Helmr. < Philop. *In An. pr.* I 23 p. 244.6 sqq. Wallies. To this list should be added schol. 10 p. 6 Helmr. whose partial source (Philop. *In De gen. et corr.* I *Prooem.* p. 4.18-26 Vitelli) can be retrieved from the parallel in P. Moraux, "Unbekannte Galen-Scholien," *Zeitschrift für Papyrologie und Epigraphik*, 27 (1977), p. 1-63: 45 l. 95-104. The source is misidentified by Moraux note ad l. 102. and by L. Perilli, "La fortuna di Galeno filosofo. Un nuovo testimonie dei commentari neoplatonici (*Scholia Yalensia*) al *De elementis*," in A. Brancacci (ed.), *La filosofia in età imperiale. Le scuole e le tradizioni filosofiche. Atti del Colloquio Internazionale, Roma, 17-19 giugno 1999* (Napoli, 2000), p. 85-135: 125.

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ment chain must then run:

$$(\mathfrak{S}_1)\ \begin{array}{ll}(\phi_1) & \forall xy(\gamma\iota\nu(x,y) \rightarrow o\mu(x,y)) \\ (\phi_2) & \gamma\iota\nu(\alpha,\sigma) \\ \hline (\phi_3) & o\mu(\alpha,\sigma) \qquad \therefore\end{array} \qquad (\mathfrak{S}_2)\ \begin{array}{ll}(\phi_3) & o\mu(\alpha,\sigma) \\ (\phi_4) & \forall xy(o\mu(x,y) \rightarrow \varepsilon\kappa(x,y)) \\ \hline (\psi) & \varepsilon\kappa(\alpha,\sigma) \qquad \therefore\end{array}$$

where the proof is in both $\mathfrak{S}_1$ and $\mathfrak{S}_2$ by universal instantiation (twice in each) and modus ponens. In $\mathfrak{S}_2 \vdash \varepsilon\kappa(\alpha,\sigma)$ is accordingly what the scholiast claims the demonstrandum to be, sc. ἡ αἴσθησις ἐκ τῶν στοιχείων (βοηθὸς … ἐκέχρητο δὲ καὶ δυσὶ συλλογισμοῖς, δεικνύς, ὅτι ⟨ἡ⟩ αἴσθησις ἐκ τῶν στοιχείων).

Now, Philop. *In De an.* I 2 p. 73.6-9 Hayduck reads: τὸ γινῶσκον ὅμοιον θέλει εἶναι τῷ γινωσκομένῳ· τὸ γὰρ ὅμοιον τῷ ὁμοίῳ γνωρίζεται … εἰ τοίνυν γινώσκει πάντα τὰ ὄντα ἡ ψυχή, δεῖ ἄρα αὐτὴν ἐκ πάντων εἶναι τῶν ὄντων. The scholiast would probably have known by the so-called synthetic theorem that one can obtain $\phi_1,\phi_2,\phi_4 \vdash \psi$ from $\phi_1,\phi_2 \vdash \phi_3$; $\phi_3,\phi_4 \vdash \psi$.[6] Let us then permute ϕ_2 and ϕ_4 and formulate the reduction of the sequence $\mathfrak{S}_1;\mathfrak{S}_2$ to $\phi_1,\phi_4,\phi_2 \vdash \psi$: τὸ ὅμοιον ὑπὸ τοῦ ὁμοίου γινώσκεται. τὸ ὅμοιον ἐκ τοῦ ὁμοίου. ἡ αἴσθησις τὰ στοιχεῖα γινώσκει. ἡ αἴσθησις ἄρα ἐκ τῶν στοιχείων.

We may now formulate ϕ_1 and ϕ_4 as propositional functions: $\gamma\iota\nu(x,y) \rightarrow o\mu(x,y)$ and $o\mu(x,y) \rightarrow \varepsilon\kappa(x,y)$ respectively, from which by transitivity (i. e. by a special case of the synthetic theorem) we obtain $\gamma\iota\nu(x,y) \rightarrow \varepsilon\kappa(x,y)$. Substitute "ἡ ψυχή" (instead of "α") for "x" and "πάντα τὰ ὄντα" (instead of "σ") for "y", and we then obtain the implication in the last sentence of the passage from Philoponus (p. 73.8-9). By appropriate Galenic substitutions (i. e. by "α" and "σ" as in ϕ_2; a proposition attested in *De elem.*) and backward reasoning from Philoponus a scholiast could have easily obtained the sequence $\mathfrak{S}_1;\mathfrak{S}_2$.[7]

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[6] Alternatively by knowledge of the third Stoic θέμα – i. e. a specialization of the synthetic theorem – Simplicius' formulation of which (*In De cael.* I 7 p. 236.33 sqq. Heiberg = FDS fr. 1168 Hülser) corresponds exactly to the reduction performed here. Cf. S. Bobzien, "Stoic syllogistic," *Oxford studies in ancient philosophy*, 14 (1996), p. 133-192: 142 sqq. (esp. p. 146, 153: T3S = T3), with further references.

[7] I suggest the following three alterations to p. 75 l. 8 Rashed: ⟨*ammā*⟩ *l-ūlā* ⟨*fa-*⟩*bi-an yaqūla*. – Instead of *bi-šabīhihī* retain *bi-šibhihī* as transmitted. – Instead of *fa-inna* read *fa-iḏan*. – Note finally that l. 11 has been left untranslated on p. 74. Prof. Rashed informs me that this line of Arabic text was not meant to be included.

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