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NUMEROLOGY AND TEXT IN ANATOLIOS OF LAODIKAIA. ON THE DECADE

I. Disorder

The sequence of thought on the heptad seems disturbed, placing material on astronomy amidst material on arithmetic and material on medicine amidst material on astronomy. Although the epitome in *Theol. Arith.* (pp. 41-42 Ast = pp. 54-56 de Falco) follows the order of the MS of Anatolios' *Decade* (pp. 35.6-36.2), § A.1-7 in the table below; it is not a reliable witness, omitting all of § B except B.1. and reporting § C in the order C.4, C.6, C.7, C.5 (omitting C.2, C.3, and C.8 altogether). Parallels from other authors confirm the dislocation (misplaced passages of Anatolios are bracketed):

- A (pp. 35.6-36.2 H.) Arithmetic
(Philon, *Alleg.* 1.15 and *Creation* 91-100;
Nikomakhos, *Arithmetic* 2 [*Theol. Arith.* p. 44 Ast = pp. 58.7-59.1 de Falco])
 - A.1 seven is neither generative nor generating
 - A.2 a series of seven additions from one gives the perfect 28
[28-day lunar month composed of heptads]
 - A.3 a series of seven doublings from one gives a number both square and cube ...
 - A.4 ... as does a series of seven triplings, etc.
 - A.5 the three dimensions plus the four limits make seven
 - A.6 seven is the first harmony (4/3) and the first geometric proportion (1, 2, 4)
[seven is significant in human reproduction and disease]
 - A.7 seven is the first right triangle (3 + 4)
- B (pp. 36.2-8 H.) Astronomy
(Varro, *Hebdomades* in Gellius 3.10.2-6;
Philon, *Alleg.* 1.8 and *Creation* 101-2, 113-116;
Nikomakhos, *Arithmetic* 2 [*Theol. Arith.* pp. 44-45 Ast = pp. 59.5-60.18 de Falco])
 - B.1 seven planets
 - B.2 -----
 - B.3 seven lunar phases
 - B.4 seven stars in the bear and in the Pleiades
 - B.5 seven-month interval of solstices and of equinoxes

- C (pp. 36.8-22 H.) The body and its activities
(Varro, *Hebdomades* in Gellius 3.10.7-15;
Philon, *Alleg.* 1.11-14 and *Creation* 117-126;
Nikomakhos, *Arithmetic* 2 [*Theol. Arith.* pp. 45-53 Ast = pp. 60-71 de Falco])
 - C.1 -----
 - C.2 seven soul parts
 - C.3 seven body parts, seven gut parts, and seven openings of head
 - C.4 seven perceptibles
 - C.5 seven voice modulations
 - C.6 seven bodily movements
 - C.7 seven vowels
 - C.8 seven strings on lyre

Anatolios begins with arithmetic, moves to astronomy (the *makrokosmos*), and then to biology and medicine (the *mikrokosmos*) – a natural development, seen also in most of the extant parallels and likely sources. The mid-first-century-BCE work *Hebdomads* (attributed by the manuscripts to Hippokrates), which was probably an influence on Anatolios and Philon (Mansfeld, 1971, 229), begins with cosmology (1-2), descends to earth (3-4), and then treats the ages of human life (5), the connection between the *mikrokosmos* and the *makrokosmos* (6), then the body and its powers (7-9), and the seven parts of the soul (10). Gellius' report of Varro's *Hebdomades* suggests that he treated astronomy (B) before the body (C), and included the bracketed passages thereunder (3.10.6 and 3.10.7 respectively). The three topics are also separated in Philon of Alexandria, *Creation* 90-127 (in the same order A, B, C), and more briefly in *Allegorical Interpretation* 1.8-15 (in the order B, C, A). (In *Creation* 106-110, Philon finds seven in musical proportions.) Philon places the first bracketed passage in a position corresponding to B (*Alleg.* 1.8 and *Creation* 101), and places the second passage in a position corresponding to C (*Alleg.* 1.9, 1.13 and *Creation* 124-5). Anatolios and Philon adhere to the same branch of the *hebdomad*-tradition, usually standing somewhat apart from Theon and Nikomakhos (Robbins, 1921, 99-100; Mansfeld, 1971, 162-163, 173-182, and 197-199), and indeed the topics arithmetic, astronomy, and biology are confused in Theon, *Mathematics* 2.46 (pp. 103-4 H.). Anatolios (pp. 36.22-25 H.) does add two references, to Plato's *Timaios* and to straits, which are not in Philon, and which are separated in Theon, *Math.* 2.46 (pp. 103.15-16 and 104.18-19 H.). Nonetheless, Nikomakhos *Arithmetic* 2 (*Theol. Arith.* pp. 42-53 Ast = pp. 56-71 de Falco) also presents the material in the order A, B, C (note especially his transition from A to B + C at p. 44 Ast = p. 59.1-3 de Falco: διὰ πολλὰ συντηγάνει ἐν τοῖς κοσμοῖς οὐρανοῖς τε καὶ περὶ γῆς, ἀστροῖς καὶ ζώοις καὶ φυτοῖς, κατ' αὐτὴν ἀποτελεῖσθαι), and includes the bracketed passages in sections corresponding to B and C respectively (pp. 44-45 Ast = pp. 59.5-60.2 de Falco and pp. 46-47 + 51-53 Ast = pp. 61.13-63.5 + 68.11-71.3 de Falco). Hermippos of Berutos (Montanari, 1998, 439), *apud* Clement of Alexandria, *Stromata* 6.16.143, includes the lunar heptads (first bracketed passage) among his astronomical

items. Anatolios (pp. 36.25–38.5 H.) concludes with a passage, taken from *Hebdomads* 5 and from Solon, on the stages of a man's life, found also in Philon, *Creation* 103–5, in Hermippos *apud* Clement, *Stromata* 6.16.144, and in Nikomakhos, *Arithmetic* 2 (*Theol. Arith.* pp. 48–50 Ast = pp. 65–67 de Falco), and in part in Varro, *Hebdomades apud* Gellius 3.10.12, and Theon, *Mathematics* 2.46 (p. 104.3–9 H.).

The first bracketed passage in Anatolios is 41 greek letters, the second 64, which possibly represents two and three lines of about 21 letters: a not untypical line-length for Greek prose (Birt, 1882, 273–281). The two bracketed passages are separated by 525 letters, or exactly 25 lines of 21 letters. I suggest that a scribe, copying line by line, completed the line ending μέρεσιν ἰσοῦμενον (p. 35.13 H.), in § A.2 in the table above, and then by mistake copied two lines (ἡμέραι σελήνης ... συμπληρωθεῖσαι) from one page or column below, before realizing his mistake and returning to the proper place. Then, 25 lines later, the scribe completed the line ending with γεωμετρικῆς α' β' δ' (p. 35.25–26 H.), in § A.6, and made the same mistake, this time copying three lines καλεῖται ... ἐβδομάς before he noticed.

The two displaced passages find their natural position in the table above at § B.2 (36.3 H.) and § C.1 (36.8 H.) respectively, which are separated by 238 letters or 11 lines of about 21 letters (e.g., 4 lines of 21 letters and 7 lines of 22 letters). The first passage would then begin 100 letters (or 5 lines) after γεωμετρικῆς α' β' δ'. Thus we have:

Lines	Passage
[2]	(B.2) 28 days of moon
25	(A.3–6)
[3]	(C.1) Telesphoros
5	(A.7 and B.1)
-----	restored B.2
11	B.3–5
-----	restored C.1

The dislocation may have occurred early, and found its way into the epitome (*Theol. Arith.*).

II. Lacuna

Heiberg records that the MS Monac. Gr. 384 marks a lacuna of 6 or 7 letters, at the beginning of § C.2 in the table above, and prints (p. 36.8–9 H.):

τὸ δίχα τὸ ----- τοῦ ἡγεμονικοῦ μέρους τῆς ψυχῆς εἰς ζ' διαίρεται

He suggests τὰ δίχα (and no lacuna) for τὸ δίχα τὸ: "the soul's things, other than the hegemonic part, are divided into 7" (similar to Philon, *Creation* 117). I suggest

filling the lacuna with ΥΜΕΡΟΥΣ, yielding τοῦ μέρους τοῦ ἡγεμονικοῦ, the word order of p. 31.5 H. (ὁ λόγος ὁ ἐν ἀναλογίᾳ) and p. 31.22 H. (τὸ τετράγωνον τὸ ἐπ' αὐτῆς). Then read τὰ for the initial τὸ, and μέρη for the printed μέρους (probably a later scribal emendation), yielding τὰ δίχα τοῦ μέρους τοῦ ἡγεμονικοῦ μέρη ..., and render "the parts of the soul, other than the hegemonic part, are divided into 7." The passage is omitted by the epitome in *Theol. Arith.*, and is lacking from Nikomakhos, *Arithmetic* 2 and the other parallels.

III. Haplography

At the beginning of the section on the decade itself, Heiberg prints (p. 39.4–5 H.):

πεντάκις γὰρ δύο ι'. κύκλος ἐστὶ παντὸς ἀριθμοῦ καὶ πέρας.

Before κύκλος a second ι' appears to have been omitted, which is the subject of its sentence. The epitome in *Theol. Arith.* (p. 63 Ast = p. 86 de Falco) has the numerals written out and only one δέκα; as for the dislocation (above, § I), this haplography may be early.

IV. Garble

Further on, after some arithmetic and some epithets, Anatolios (p. 39.16–19 H.) says:

χωρίων τε ἴση περίμετρος ΕΒΔΟΜΑΔΩΝ εὐρίσκεται τοῦ ι' τετραγώνου καὶ τοῦ ιη' προμήκους· πλευραὶ δὲ τούτων δ' καὶ F'· τετράκις γὰρ δ' ι', καὶ ἑξάκις γ' ιη', τὰ δὲ δ' καὶ F' ποιεῖ τὸν ι'.

Heiberg remarks *quae sequuntur obscura*, and the text as printed is indeed nonsense; Tannery translates the Latin (*arearum ipsarum*) of G. Valla, but banishes χωρίων τε ... ἑξάκις γ' ιη' to the margin as otiose. The epitome in *Theol. Arith.* (pp. 63–64 Ast = pp. 86–87 de Falco) breaks off before this passage, which is also omitted by Nikomachos and Philon.

I suggest that ΕΒΔΟΜΑΔΩΝ is wrong and arose as follows: ΕΜΒΑΔΩ was mis-copied as ΕΒΜΑΔΩ, and then 'corrected' to ΕΒ[ΔΟ]ΜΑΔΩ[N]. For ἐμβαδ- "area" cp. Heron, *Metr.* 1. pr. 1.1, 1.8, 1.31, 1.35, etc.; *Geom.* 21, 24, etc.; Theon, *Math.* 3.3 (p. 126 H.); Diophantos, *Arith.* 6.17, etc.; and especially Anat. p. 32.9 H. More to the point, the same idea, similarly expressed, occurs in Anat. p. 31.22–23 H. (of the number 4):

τὸ τετράγωνον τὸ ἐπ' αὐτῆς, τοιούτῳ τὸ ἐμβαδόν, τῇ περιμέτρῳ ἴσον κτλ.

So far from otiose and marginal, the emended text fits Anatolios' thought, and explains the otherwise dangling τὰ δὲ δ' καὶ F' ποιεῖ τὸν ι' . Render "perimeter equal to area of figures is found in the case of the square 16 and the rectangle 18", and the rest is no longer obscure, but clear. Anatolios correctly gives the sole quadrangular figures in integer side whose area is numerically equal to their perimeter.

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Abstract

Anatolios' *Decade* is rarely read despite its interest as a document of the transition from late paganism to early Christianity. Dating probably from his tenure as professor in Alexandria, it is the earliest extant work devoted to neo-pythagorean arithmology: the earlier *Mathematics* of Theon of Smurna only includes a little such material, while merely fragments of the earlier *Arithmetic* of Nikomakhos of Gerasa are preserved, in the summary by Photios of what may be Iamblikhos' work. Here I want to offer four emendations to the text of Anatolios as printed by Heiberg (1900): the text is disordered and has a lacuna in the section on 7, while in the material on 10 there is a haplography and a garble.