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THREE NOTES ON THE *EUCLIDES LATINUS* PRESERVED IN THE VERONA MANUSCRIPT, BIBLIOTECA CAPITOLARE XL (38)*

Six palimpsest folios – or, to be accurate, three bifolios – of the Verona manuscript, Biblioteca Capitolare XL (38), contain fragments of a Latin translation of Euclid's *Elements*: fols. 331v–r and 326v–r, 341r–v and 338r–v, 336r–v and 343r–v. The folios are dated to around A.D. 500, and the text is written in capital script in two columns. Unfortunately the folios have suffered severe damage from various chemical substances, which were used by nineteenth-century scholars in attempts to retrieve the underlying text. Nevertheless, an edition of the fragments finally appeared in 1964 by M. Geymonat.¹

With modern techniques for deciphering palimpsests, it would perhaps in the future be possible to extract more text from the folios and to obtain more reliable readings of obscure passages. Ventures to this end are to be encouraged, and hopefully this paper will at least in some respect contribute to a renewed interest in the fragments among specialists in palimpsests. For the time being, however, Geymonat's edition will have to do as basis for philological studies of the fragments.²

I. On three occasions in the fragments Geymonat read *deliget*:

fol. 331v col. 1, lines 11–12 (p. 14, 11–12 Geymonat)
DELIGETQUAE ·AT·...· | ·EB·BZ·EZ· SUNT

fol. 336v col. 2, lines 14–15 (p. 33, 14–15 Geymonat)
EST — (D)<E>(LI)GETQUA[~] | ·T· [—]

fol. 336v col. 2, line 17 (p. 33, 17 Geymonat)
[—] DELIGETQUOd

* I thank Prof. Michel Federspiel, Clermont-Ferrand, and Prof. Jean-Yves Guillaumin, Besançon, for their comments on an earlier draft of this paper. For more critical notes on this text, see E. Bohlin, 'Some Notes on the Fragmentary Latin Translation of Euclid's *Elements* Preserved in the Codex Palimpsestus Veronensis Bibliothecae Capitulare XL (38)', in F. Biville, M.-K. Lhommé, D. Vallat (eds.), *Latin vulgaire – latin tardif IX. Actes du IXe colloque international sur le latin vulgaire et tardif, Lyon, 2–6 septembre 2009* (Lyon, 2012), 881–92.

¹ M. Geymonat (ed.), *Euclidis latine facti fragmenta Veronensia* (Milan, 1964). For a more detailed description of the folios and previous research on them, see Geymonat pp. 5–9, 55–65. For an introductory survey of Euclid in the Middle Ages, see M. Folkerts, 'Euclid in Medieval Europe', in id., *The Development of Mathematics in Medieval Europe. The Arabs, Euclid, Regiomontanus* (Aldershot, 2006), 3.1–64.

² Explanation of some of the critical symbols and conventions used in Geymonat's edition (for further details, see Geymonat [n. 1], 13): full stop (.) = illegible letter; dash (—) = two or more illegible letters; dash within square brackets ([—]) = illegible part of the text due to damaged parchment; full stop within square brackets ([.]) = illegible letter due to damaged parchment; letter(s) within round brackets = letter(s) illegible to Geymonat, but preserved in a transcript made by A. Mai in 1817 (see Geymonat [n. 1], 13 and 56–7; the transcript is found in Vat. lat. 9555, Bibl. Apost. Vat., fols. 96r–100v, 145r–v, 144r); letter(s) within angle brackets (< >) = letter(s) supplied by conjecture. In addition, small capitals are used in the edition for letters which are written in the palimpsest in smaller size than the regular script.

It should also be pointed out that the following two signs are used in the palimpsest as well as in the edition: interpunct (·) is used for separating pairs or groups of Greek letters; *linea nasalis* (˘) occurs at the end of a line and after the vowel to which it belongs.

Geymonat probably identified *deliget* as the verb *deligere*, for in his note on the *deliget* on fol. 331v he reports I. Cazzaniga's conjecture *delige et* with the additional comment 'fortasse recte',³ and in his *index verborum* to the edition all three occurrences of *deliget* are recorded together under the same lemma: *deliget*.⁴ I would suggest, however, that it is far more likely that <UI>DELIGET, <UI>(D)<E>(LI)GET, and <UI>DELIGET, that is, the adverb *videlicet*, should be read. On the first occasion (fol. 331v col. 1, line 11), the second half of the preceding line 10 is illegible. On the second occasion (fol. 336v col. 2, line 14), several letters are illegible between EST and (D)<E>(LI)GET. And, finally, the first half of the line in which the third *deliget* is found (fol. 336v col. 2, line 17) is illegible as well. Hence, in all three occurrences, the letters U and I may well once have been written before *deliget*.

At fol. 331v col. 1, lines 11–12, *deliget* is followed by the relative clause QUAE [sc. *plana*] ·ΑΓ·...· | ·ΕΒ·ΒΖ·ΕΖ· SUNT, which, as the corresponding passage in the Greek text of Euclid shows (*Elements* 11 Prop. 24 p. 70,19 Heiberg),⁵ obviously specifies six planes by which a certain solid is comprehended. At fol. 336v col. 2, lines 14–15, *deliget* is most likely followed by a relative clause of similar, specifying type: (D)<E>(LI)GET QUA | ·Γ· (= *deliget quam* [sc. *lineam*?] Γ?). At fol. 336v col. 2, line 17, finally, *deliget* is followed by QUOD, which probably also begins a relative clause of the aforementioned type. Now, consider the following passages, in which the words *videlicet* and *scilicet* are read: fol. 341v col. 1, lines 21–2 UIDELICET ILLAE [sc. *lineae*] QUAE | ·ΑΒ·, fol. 343r col. 1, line 10 ET UIDELICET QUEM [sc. *angulum*] ·(ΖΘ)Δ·, and fol. 343r col. 1, lines 13–14 ET SCILICET QUEM [sc. *angulum*] ·ΖΕΑ· TES | TAN(TUR). As these examples indicate, the obscure occurrences of *deliget* are most likely the remains of three original instances of *videlicet*.

The word *videlicet* is spelled with a C at fol. 331r col. 1, line 13, fol. 341v col. 1, lines 9 and 21, fol. 341v col. 2, lines 2–3, fol. 338r col. 2, line 22, fol. 343r col. 1, lines 3 and 10; cf. also fol. 341r col. 2, line 9 and fol. 343r col. 1, line 13, where the word *scilicet* is spelled with a C. Since *videlicet* is usually spelled with a C, I think that the three examples of the spelling with G are to be regarded as scribal errors; moreover, I have not found any other attestation of the letter G being used instead of an expected C in the fragments.

Occasionally, however, the letter C is found instead of an expected G. At fol. 343r col. 1, line 2, RELICABUNT is written, where *religabunt* would have been expected;⁶ so also at fol. 336v col. 1, line 19, where R<E>LICABUNT (with the letters N and T written in nexus) is read. At fol. 341r col. 2, line 8, SECTIO(NE)S occurs, but a contemporary corrector has deleted TIO(NE)S and added MENTA above the line, producing the corrected reading *segmenta*, where *segmenta* would have been expected. At fol. 341r col. 2, line 23–fol. 341v col. 1, line 1, Geymonat reads TRIAN | <GULAS SEDES>; a contemporary corrector, however, has deleted AN and added CONAS above the top line of fol. 341v col. 1, which gives the corrected reading *triconas*, where *triconas* would have been expected.⁷

³ Geymonat (n. 1), 38.

⁴ Geymonat (n. 1), 47.

⁵ J.L. Heiberg (ed.), *Euclidis Elementa. Edidit et latine interpretatus est I. L. Heiberg. Vol. IV. libros XI–XIII continens* (Leipzig, 1885).

⁶ Mai initially wrote *religabunt* in his transcript, but then corrected it to *relicabunt*; see Vat. lat. 9555 fol. 100r and Geymonat (n. 1), 44. Cf. n. 2 above.

⁷ The top line of fol. 341v col. 1 is illegible, but Geymonat, rightly as it seems, supplied GULAS SEDES and suggested that GULAS, together with AN at fol. 341r col. 2, line 23, was deleted by the

II. At fol. 341r col. 1, lines 3–4 (p. 22,3–4 Geymonat) the following is read:

(QUODFUITE)XPEDI | RERATIONES

These words end a short fragment of Euclid, *Elements* 12 Prop. 2. In his note ad loc., Geymonat compares the phrase *expedire rationes* with Vitruvius, *De architectura* 10.16.12:⁸ *Quas potui de machinis expedire rationes pacis bellicae temporibus et utilissimas putavi, in hoc volumine perfecī.*⁹ This comparison, however, is hardly apt, since *quod fuit expedire rationes* is, most probably, a Latin rendering of the Euclidean ὅπερ ἔδει δεῖξαι, nowadays more commonly known in the Latin form *quod erat demonstrandum* (Q.E.D.), which is regularly placed at the end of a proof and signals its completion.¹⁰ The *quod fuit expedire rationes* is, moreover, probably the earliest preserved Latin translation of the famous phrase. In the fragmentary Latin translation of Euclid's *Elements* ascribed to Boethius, the phrase *quod oportebat facere* is attested;¹¹ there, however, the Latin is a translation of the similar phrase ὅπερ ἔδει ποιῆσαι, equivalent to the Latin form *quod erat faciendum* (Q.E.F.).

III. According to Geymonat's edition the following is read at fol. 341v col. 1, lines 5–7 (p. 24,5–7 Geymonat):

(SECTIONESSIUEDA)NTUR | (QUIDEM)QUOIUREQUAE | SUNT ·AB·BF· [...]·ΔB·ΔΓ·

A comparison with the Greek text of Euclid indicates that the words after the initial *sectiones* ought to be rendering the following phrase: Τετμήθωσαν γὰρ αἱ AB, BF, ΓA, AΔ, ΔB, ΔΓ δίχα (*Elements* 12 Prop. 3 p. 150,7–8 Heiberg). Hence, (SIUEDA)NTUR is probably either a corrupt or misread *dividantur*, which would correspond to τετμήθωσαν.¹² Furthermore, as I would argue, the reading QUO IURE does not make sense. It is, most likely, either a corruption or a misreading.¹³ In either case, I suggest that QUO IURE should be corrected to *duo illae*. In capital script the letters D and Q (and O) are easily confused. Moreover, capital A may easily be mistaken for R, and the combination LL may be confused with U, especially if the lower parts

corrector. In addition, at fol. 338r col. 2, line 11 only the correction CONAS, written above the line, can be read; Geymonat therefore suggested that *triangulas* originally was read in this line.

⁸ Geymonat (n. 1), 40.

⁹ Cf. L. Callebaut and P. Fleury (edd.), *Dictionnaire des termes techniques du De architectura de Vitruve* (Hildesheim, Zurich and New York, 1995), s.v. *expedio* (col. 108). (Note that not all attestations of the verb *expedire* in Vitruvius are recorded in the dictionary.)

¹⁰ On *est* with the infinitive = *licet*, *oportet* etc. with the infinitive, see J.B. Hofmann and A. Szantyr, *Lateinische Syntax und Stilistik* (Munich, 1965), 349 and e.g. J. Svennung, *Orosiana. Syntaktische, semasiologische und kritische Studien zu Orosius* (Uppsala, 1922), 78–81. The *rationes* may, in my view, be regarded as some type of inner object to *expedire*. As noted by E. Wistrand, moreover, there are in Vitruvius not a few occurrences of abstract nouns, e.g. *ratio*, carrying a very vague, or even redundant, force (see E. Wistrand, *Vitruviusstudier* [Gothenburg, 1933], 48–50); I suggest that this could be the case with our *rationes* too.

¹¹ Euclid. *elem. vers. M* lines 332, 346, 356 (M. Folkerts [ed.], 'Boethius' *Geometrie II. Ein mathematisches Lehrbuch des Mittelalters* [Wiesbaden, 1970], 215 and 217.) The reference is abbreviated according to the *Thesaurus Linguae Latinae* (TLL); see the Index to the TLL (Leipzig, 1990), 91.

¹² If it is a misreading, it is to be put on Mai's account; cf. n. 2 above.

¹³ In his edition Geymonat did not point out that it was difficult to read; in fact, as Geymonat reports, Mai also read QUO IURE (see also Vat. lat. 9555 fol. 99v; cf. n. 2 above). Therefore, if Mai and Geymonat read correctly, it ought to be a corruption. On the other hand, since Mai's transcript was made in haste and not very diligently, it cannot be ruled out that Mai may have misread and Geymonat then was led into error by Mai (on the quality of Mai's transcript, see Geymonat [n. 1], 56–7).

of the letters LL are somewhat obscured and, as is the case with the script of the palimpsest folios, the letter ‘U approaches the uncial form’.¹⁴

By reading *dividantur quidem duo illae quae sunt* AB, BΓ, ??, ??, ΔB, ΔΓ, a sensible correspondence with the Greek is beginning to emerge: *dividantur* = τεμήσθωσαν, *quidem* = γάρ, *illae quae sunt* = αἰ, *duo* ≈ δίχα. Granted the conjecture *duo illae*, however, a difficulty emerges: one would have expected the preposition *in* between *quidem* and *duo*. The preposition is undoubtedly indispensable; cf. fol. 341r col. 2, lines 3–4 and 21–2, where the verb *dividere* in the passive is construed with the prepositional phrase *in duas pyramidas*; but cf. especially the following examples of the verb *dividere* + *in duo*, where *in duo* (in the neuter) approaches the function of an adverb (like δίχα):

Deinde ultima aequitatis tractatio: an quod fecit [sc. maritus] facere debuerit. Hoc divisit [sc. Latro] **in duo**: an iam certam sterilitatem uxoris tam bonae ferre debuerit [sc. maritus]; an ne sterilis quidem pro certo sit.

(Seneca, *Controversiae* 2.5.13)

Si damnari dementiae aliquis pater, etiam non demens, ob aliquod improbandum factum potest, an hic possit. Hoc **in duo** divisit [sc. Latro]: an, etiamsi hoc animo dixit ut filiam mori vellet, damnandus tamen non sit [...] [9] Deinde: an non eo animo dixerit ut illam mori vellet.

(Seneca, *Controversiae* 10.3.8–9)

In duo et Posidonius dividit, vocem et res.

(Quintilian, *Institutio oratoria* 3.6.37)

Causa ipsa dividitur **in duo**, in impulsionem et ratiocinationem.

(Marius Victorinus, *Explanations in Ciceronis rhetoricam* 2.5.1–2)¹⁵

In addition, in the fragmentary Latin translation of Euclid’s *Elements* ascribed to Boethius, the Euclidean δίχα is rendered in various ways: *in duas aequales/aequas partes*,¹⁶ *per aequalia*,¹⁷ *in duo aequa*. In the following example, the last expression is found used absolutely, as it were: *Datam circumferentiam semicirculi in duo aequa dividere*.¹⁸

On the one hand, the expected *in* may have been erroneously left out by the scribe. If so, the intended text should be re-established thus: *dividantur quidem <in> duo illae quae sunt* AB, BΓ, ??, ??, ΔB, ΔΓ. On the other hand, the expected *in* may lie concealed in QUIDEM, which was read only by Mai.¹⁹ Since Mai’s transcript is not always trustworthy and since Mai, as is correctly reported in Geymonat’s edition, doubted his own reading of the letters D and E in QUIDEM,²⁰ it can, in my view, be suggested that QUIDEM is a misreading of *quippe in* (PP erroneously read as D, E correctly read, and IN erroneously read as M). If so, the intended text should be re-established thus:

¹⁴ E.A. Lowe, *Codices Latini antiquiores. A Palaeographical Guide to Latin Manuscripts Prior to the Ninth Century. Part IV. Italy: Perugia–Verona* (Oxford, 1947), 28.

¹⁵ A. Ippolito (ed.), *Marii Victorini Explanations in Ciceronis rhetoricam* (Corpus Christianorum. Series Latina: 132) (Turnhout, 2006).

¹⁶ *in duas aequales partes*: Euclid. *elem. vers. M* lines 156 and 157 (Folkerts [n. 11], 193); *in duas aequas partes*: ibid. lines 262 and 263 (Folkerts [n. 11], 207).

¹⁷ *per aequalia*: Euclid. *elem. vers. M* line 240 (Folkerts [n. 11], 203).

¹⁸ Euclid. *elem. vers. M* line 271 (Folkerts [n. 11], 209). In line 197 (Folkerts [n. 11], 197), on the other hand, *spatia* should perhaps be implied thus: [...] *aeque* [sc. *spatia*] *diametris in duo aequa* [sc. *spatia*] *partitur*. If so, *in duo aequa* is not being used absolutely.

¹⁹ See Vat. lat. 9555 fol. 99v; cf. n. 2 above.

²⁰ See Vat. lat. 9555 fol. 99v; cf. n. 2 above. See also Geymonat (n. 1), 24, line 6.

dividuntur quippe in duo illae quae sunt AB, BΓ, ??, ??, ΔB, ΔΓ. Of course, it could also be the case that QUIDEM is indeed the transmitted text, but represents a scribal corruption of *quippe in* accomplished by the scribe. If accepted, this conjecture neatly restores the desired *in*, and γάρ is given a Latin rendering which is attested elsewhere in the fragments.²¹

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²¹ At fol. 331v col. 1, lines 7–9, <SOLI>DUM QUIPPE corresponds to στερεὸν γάρ (*Elements* 11 Prop. 24 p. 70,18 Heiberg), at fol. 326v col. 2, lines 2–3, EICIATUR QUIPPE corresponds to ἐκβεβλήσθω γάρ (*Elements* 11 Prop. 25 p. 74,11 Heiberg), and at fol. 338v col. 1, lines 1–2, CONPLEANTUR QUIPPE corresponds to συμπληρώσθω γάρ (*Elements* 12 Prop. 8 p. 178,1 Heiberg).