Why John Chortasmenos

Sent Diophantus to the Devil

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P

erhaps the most widely known scholium to a Greek mathematical work is found in the *Matritensis Bibl. Nat*. 4678, f. 74r *marg. inf*. It comments on a problem in Dio­phantus’ *Arithmetica*, of which the Madrid manuscript is one of the main witnesses:

ἡ ψυχή σου Διόφαντε εἴη μετὰ τοῦ Σατανᾶ ἕνεκα τῆς δυσκολί(ας) τῶν τε ἄλλων σου θεωρημάτων καὶ δὴ καὶ τοῦ παρόν(τος) θεωρή(μα)τος

Diophantus, may your soul be with Satan because of the difficulty of the other theorems of yours, and in particular of the present theorem

The gloss was written by an exasperated John Chortasmenos (†1431), a Byzantine erudite particularly skilled in astron­omy and mathematics—even if he apparently found one of Dio­phantus’ problems too difficult. His hand was identified about twenty years ago by N. Wilson.[[1]](#footnote-2) The identification has recently been confirmed by I. Pérez Martín;[[2]](#footnote-3) her analysis of the several hands that annotated the *Matritensis* shows that Chor­tas­menos was a very attentive, and active, reader of the *Arithmetica*.

On the identity of the author of the annotation I have nothing to say. The point I want to make in this note is that the traditional identification of *Arithmetica* 2.8 as the Diophantine problem to which the scholium is related is surely wrong. This identification was first put forward by P. Tannery, when he edited a handful of scholia in the second volume of his Teubner edition of Diophantus’ extant works.[[3]](#footnote-4) It has subsequently been endorsed by A. Allard in his edition of the *scholia vetera* to the *Arithmetica*,[[4]](#footnote-5) by N. Wilson,[[5]](#footnote-6) B. Mondrain,[[6]](#footnote-7) and J. Herrin.[[7]](#footnote-8) T. L. Heath, with his unparalleled sobriety, did not pay attention to the scholium.

The traditional identification relates the scholium to a prob­lem, namely *Arithmetica* 2.8, which two centuries later triggered another, and most celebrated, marginal annotation, this time by Pierre Fermat (160?–1665): this annotation contains the statement universally known as ‘Fermat’s last theorem’, which resisted for about 350 years every attempt at proof until it finally capitulated in 1995 thanks to A. Wiles. In this way, a nice story can be told about the persistence of difficult mathematical problems, about the importance of marginal annotations in the process of transmission of knowl­edge, and, most notably, about the fact that Byzantine scholars were after all not so badly equipped to appreciate a supremely difficult author such as Diophantus is—at least, they were able to ap­preciate when a Diophantine problem was truly a difficult one. Both Wilson and Mondrain cite the connection between *Arith­metica* 2.8 and Fermat’s theorem, and draw one or the other of these morals from the story.

I shall first show, on mere palaeographical grounds, that the problem related to Chortasmenos’ scholium is, in keeping with Tannery’s first insight, *Arithmetica* 2.7. I shall then argue that there is a very good mathematical reason for this being so: both the enunciation and the solution of problem 2.8 are almost trivial, whereas both the enunciation and the solution of prob­lem 2.7 we can rightly term difficult, as Chortasmenos does. In this way, the connection of the scholium (which Fermat surely did not read) with Fermat’s last theorem (prompted by 2.8) evaporates.

My first point is straightforwardly made.[[8]](#footnote-9) The scholium is located in the lower margin of f. 74r, with a centered dis­position of the three lines. The first two of these lines are longer than the third, and each of them takes about ⅔ of the length of a line of the main text; the third line of the scholium is about ⅓ as long as any of the other two. The module of the script is larger than in any other Diophantine scholium by the same author, and hence its ir­regular character is accentuated: Chor­tasmenos does not hide his anger. The scholium immediately follows the main text, and it is preceded by a reference sign in the form of a cross. The same sign is found in the main text; it is located to the right of the last word of *Arithmetica* 2.7. The vertical stroke of the cross passes through the dot by which the copyist of this portion of the *Matritensis* closes the text of this problem; the horizontal, wave-like stroke of the cross is at about the middle of the interlinear space. A blank space of about ¼ of a line follows the end of problem 2.7. Problem 2.8 starts, with a rubricated letter as usual in this manuscript, at the beginning of the subsequent line and fills the last 3 lines of f. 74r (problem 2.7 takes 14 lines in the same page, preceded by 12 lines pertaining to 2.6). In this way, the scholium is just below the initial part of problem 2.8, and the in-text cross is located above the enunciation of 2.8, more precisely above the word τετραγώνους that closes the enuncia­tion. Nevertheless, the cross is located at a more significant position if it is related to problem 2.7: it is at the very end of it, and the invective bears in fact on the difficulty of a problem taken as a whole.

A confirmation of this comes from surveying, first, the distri­bution of Chortasmenos’ scholia both within the manuscript and with respect to the main text, second, the ways in which he identifies the text to which a scholium is related. As for the first issue, Pérez Martín’s analysis shows that six hands preceded Chortasmenos in annotating the *Arithmetica*, his and his prede­cessors’ scholarly work being concentrated in the first two books. As a consequence, Chortasmenos had to adapt the posi­tion and the form of his scholia to margins and interlinear spaces more or less filled with earlier annotations. It happens, for instance, that the scholium of his that surrounds the text of problem 2.8 on f. 74v [[9]](#footnote-10) relates to 2.11,[[10]](#footnote-11) a problem that one starts reading only on f. 75r—in its turn a page whose margins were already, and almost completely, filled by earlier scholia. One may reasonably surmise that the scholium to 2.11 was redacted after Chortasmenos had read that proposition, and *a fortiori* after he had read 2.8:[[11]](#footnote-12) it follows that the margins of f. 74v still lay blank when Chortasmenos read, and filled with short interlinear annotations, problem 2.8. He then had time and space to write down his short invective just above or beside problem 2.8. He did not do that simply because the invective relates to 2.7, which is entirely contained in f. 74r. However, he could not find a better place for the invective than the lower margin of f. 74r because the upper and outer margins of *this* page were already filled by earlier scholia, which extend exactly as far as the last line of the main text. But there is more. Chor­tasmenos clarifies the last two words of problem 2.8 on f. 74r (hence, the last two words of the main text in this page) by a short interlinear remark ἥ (*sic*) μονάδων δώδεκα placed *above* them. Apparently dissatisfied with this, he cancelled it by a stroke and replaced it by τουτέστι τετράδος μιᾶς ἥ μ(ονάδ)ων ιβ´ ε´ων, this time *below* the two words at issue. Now, this second annotation clearly gets sandwiched between the last line of the main text and the invective: it is traced in a smaller script and in such a way as to avoid the latter; therefore, it was written after it, and, conversely, the invective itself was written before Chortasmenos had started reading problem 2.8.

As for the ways in which Chortasmenos identifies the text to which a scholium is related, five different conventions can be recorded. First, no reference sign precedes the very short in­terlinear annotations, hundreds in number, that are placed im­mediately above or below Diophantine clauses or words to be clarified. These annotations fill up the interlinear spaces of the text of the first two books of the *Arithmetica*, and mainly consist in identifications of the numerical values actually per­taining either to the expressions containing the ‘unknown’ or to the designations of the sought numbers.[[12]](#footnote-13) This confirms Chor­tas­menos’ skills and his eagerness in studying Diophantus, for the numerical identifications are generally right and in this way he had to work out the problem twice. Second, a canonical *gamma-rho* compendium precedes annotations that apparently are short scholia, textual variants, or integrations that Chortas­menos suggests should be taken into account and that he could have found in some other source.[[13]](#footnote-14) Third, a conventional sign (like those for the sun or the moon, bizarre geometrical shapes, etc.), followed by the participle κείμενον, precedes a passage that, according to Chortasmenos or to some of his other sources, should belong in the main text. Fourth, a series of conventional signs precede long annotations related to a short stretch of text: clarifications of deductive steps, alternative procedures of solutions, terminological points. Fifth, a cross precedes scholia that usually offer comments on a problem taken as a whole. I have counted 11 of these,[[14]](#footnote-15) and only in the case of our invective does the cross have a counterpart some­where in the main text.[[15]](#footnote-16) I surmise, then, that the responding cross at the end of problem 2.7 was added to make it clear that, despite its position, the scholium containing the invective has to be related to this proposition, not to the subsequent one.

These considerations seem to me enough to make a strong case, independently of the mathematical content of the two problems involved, in favour of the fact that the scholium com­ments on problem 2.7, not on 2.8. But there are also math­ematical reasons that support this conclusion. In order to better assess this point, let us read first the enunciation of *Arithmetica* 2.8 (it is to be understood that the “squares” at issue are square rational numbers—note that they are designated by masculine adjectives):[[16]](#footnote-17)

τὸν ἐπιταχθέντα τετράγωνον διελεῖν εἰς δύο τετραγώνους

To divide an assigned square into two squares

Each problem of the *Arithmetica* is solved by concretely setting out the assigned numbers (in the case of 2.8, the assigned square is taken to be 16), by positing one unknown and by solving the resulting equality (‘equation’ in our language) by taking into account the constraints involved in the enunciation. Apart from this very general approach, there is no standard method to solve any specific set of Diophantine problems: the *Arithmetica* presents a host of clever tricks and specific manipu­lations, which a student gets acquainted with by simply doing Diophantine problems. Mathematics is mathematics is math­ematics is mathematics …

Now, the procedure of solution of 2.8 is well expounded, easy to follow, quite compelling, involving an equation that was re­peatedly solved in Book 1, and applying a trick (as in almost any other Diophantine problem) that is introduced there for the first time in the *Arithmetica* but whose rationale is clearly if briefly explained (as happens with almost no other Diophantine trick).[[17]](#footnote-18) What is more, problem 2.8 is actually given two differ­ent solutions, the second being marked by ἄλλως as usual and more or less amounting to a repetition of the first. In short, Diophantus quite uncommonly provides his readers with all the tools necessary to follow and understand step by step the whole procedure of solution of problem 2.8.

On the other hand, the very enunciation of problem 2.7 in­volves a subtle notion (here underlined):[[18]](#footnote-19)

εὑρεῖν δύο ἀριθμοὺς ὅπως ἡ ὑπεροχὴ τῶν ἀπ᾽ αὐτῶν τετρα­γώνων τῆς ὑπεροχῆς αὐτῶν δοθέντι μείζων ᾖ ἢ ἐν λόγῳ

To find two numbers such that the difference of the squares on them is by a given (number) greater than in ratio to their difference

The relation “being by a given number greater than in ratio” is never met elsewhere in the *Arithmetica*, and quite infrequently in Greek mathematical works.[[19]](#footnote-20) It is defined and studied, applied to magnitudes and not to numbers, only in definition 11 and propositions 10–11 and 13–21 of Euclid’s *Data*, a work spe­cifically devised to provide language and tools necessary for the so-called ‘method of analysis and synthesis’. It is quite an outlandish notion, as the contrived translation offered above already testifies:[[20]](#footnote-21) in general (*Data* def. 11), a magnitude *A* is by a given magnitude *C* greater than in ratio to *B* when (*A* − *C* ) : *B* is a given ratio. In the instance of problem 2.7, *A* and *B* are suitable combinations of the sought numbers, *C* = 10, and the given ratio is 3 : 1. A reader who is not well acquainted with Euclid’s *Data* is likely to get lost when confronted with this enunciation. That Chortasmenos was in fact at a loss is shown by two facts. First, by the mean­ingless scholium he transcribed above the first line of 2.7 in f. 74r γρ(άφεται) δοθέντι λόγῳ μεῖζον ᾖ καὶ ἔτι δοθέντι ἀριθμῷ, where the reference sign γρ(άφεται) is repeated, one line be­low, above the participle δοθέντι in the enunciation. Second, by the fact that his interlinear glosses to 2.7 are less frequent than usual[[21]](#footnote-22) and get abruptly interrupted four lines before the end of the problem: Chortasmenos had lost contact with the argumentative pro­gression of problem 2.7.

On these grounds, understanding or even following the simple but reader-unfriendly procedure of solution of 2.7 amounts more to an act of faith than to a true process of learning. What is more, this procedure is introduced by a “determination” that is not at all easy to derive from the enuncia­tion.[[22]](#footnote-23) In short, problem 2.7 can well be characterized as carry­ing a remarkable degree of δυσκολία. Nor could Chor­tasmenos be helped, in his effort to understand 2.7, by the scholia he found in the *Matritensis* itself [[23]](#footnote-24) or by Planudes’ com­mentary, supposing he had access to it.[[24]](#footnote-25)

Tannery’s misidentification, subsequently endorsed by all scholars, can be explained by the admittedly ambiguous posi­tion of the scholium and of the cross attached to it. But a deeper reason probably lies in the belief that the undeniable difficulty of proving the statement called ‘Fermat’s last the­orem’ somehow projects back on the Diophantine problem that gave rise to the statement itself, thereby making it a most appro­pri­ate target of Chortasmenos’ invective. I hope to have shown that this belief is unfounded, that 2.8 is an important but by no means difficult problem of the *Arithmetica*, and that some features of 2.7 single it out as a more appropriate target of the invective than 2.8.[[25]](#footnote-26)

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1. N. Wilson, *Scholars of Byzantium*2 (London 1996) 279, *addendum* to 233, n. 13. For a first orientation on Chortasmenos, maybe καθολικὸς διδάσκαλος in the Prodromos of Petra, see H. Hunger, “Johannes Chortasmenos, ein byzantinischer Intellektueller der späten Palaiologenzeit,” *WS* 70 (1957) 153–163; *PLP* XII no. 30897; A.-M. Talbot, *ODB* I (1991) 431–432; and, more recently, M. Cacouros, “Jean Chortasménos, *katholikos didaskalos*, an­notateur du *corpus logicum* dû à Néo­phytos Prodromènos,” *BBGG* n.s. 52 (1998) 185–225 (n.3 on the date of Chortasmenos’ death), which includes a rich bibliography. Chortasmenos was the author of the transliteration in min­uscule of the text of the sixth-century illuminated manuscript *Vind. Med. gr*. 1, the celebrated ‘Vienna Dioscorides’, which he also partly restored: E. Gamillscheg, “Johannes Chortasmenos als Restaurator des Wiener Diosku­rides,” *Biblos* 55.2 (2006) 35–40. [↑](#footnote-ref-2)
2. I. Pérez Martín, “Maxime Planude et le *Diophantus Matritensis* (*Madrid*, *Biblioteca Nacional*, ms. 4678): un paradigme de la récupération des textes anciens dans la ‘renaissance paléologue’,” *Byzantion* 76 (2006) 433–462, at 450 (in particular n.56). This article presents a detailed codicological analysis of the manuscript, which contains Nicomachus *Introductio arithmetica* (ff. 4r–57v), Diophantus *Arithmetica* and *De polygonis numeris* (58r–130v and 130v–135v), Cleonides/[Euclid] *Introductio harmonica* (137r–142r; the work is here ascribed to Zosimos, but a title εἰσαγωγὴ ἁρμονικὴ εὐκλείδου has crept into the text four lines before its end, and constitutes now the next-to-last line of f. 141v), Euclid *Sectio canonis* (142r–143v, incomplete). Pérez Martín also dates the manuscript, formerly assigned to the thirteenth cen­tury, to the mid-eleventh century. [↑](#footnote-ref-3)
3. Chortasmenos’ invective is edited, among the *in Diophantum scholia vetera*, in *Diophanti opera omnia* II (Leipzig 1895) 260.24–26. Tannery simply pre­cedes it with the indication “Ad probl. II, 8.” The denomination *scholia vetera* was used by Tannery to set them in opposition to the running commentary on the first two books of the *Arithmetica* (edited at II 125–255), redacted in the form of a scholiastic corpus by the distinguished scholar Maximus Planudes (†1305). Chortasmenos’ invective is in fact the only *scholium vetus* exclusive to the *Matritensis* printed by Tannery, as he himself explains (II xv): “margines huius codicis iampridem exesae fuerunt, iisque sedulo inspectis, perpauca colligenda credidi, nulla edenda, nisi quod ultimum admisi (p. 260, 24–26) in gratiam doctissimi Heiberg qui mihi maledictum illud iamiam indicaverat.” As a matter of fact, Tannery changed his mind about the *relatum* of the scholium: when he first published it in a study preliminary to his edition, he wrote: “Une seule (sur II, 7) m’a paru curieuse comme trait de mœurs” (P. Tannery, “Les manuscrits de Diophante à l’Escorial,” *Nouvelles Archives des Missions scientifiques et littéraires* 1 [1891] 383–393, at 393, repr. *Mémoires scientifiques* II [Toulouse/Paris 1912] 418–432, at 432). Tan­nery did not justify this ascription, which apparently has gone un­noticed by all subsequent scholars. [↑](#footnote-ref-4)
4. A. Allard, “Les scolies aux *Arithmétiques* de Diophante d’Alexandrie dans le *Matritensis Bibl. Nat*. 4678 et les *Vaticani gr*. 191 et 304,” *Byzantion* 53 (1983) 664–760, at 695 (edition of the Greek text: it is scholium no. 95) and 734 (translation, followed by this commentary: “Il semble bien que cette scolie s’applique au problème II, 8. Elle se passe évidemment de tout com­men­taire !”). [↑](#footnote-ref-5)
5. *Scholars of Byzantium* 233: “A note in the margin at book II proposition 8, how to divide a given square into two other squares, reads [*a translation of the scholium follows*].” Pérez Martín, *Byzantion* 76 (2006) 450, does not mention the proposition to which the scholium has to be related. [↑](#footnote-ref-6)
6. B. Mondrain, “Traces et mémoire de la lecture des textes : les *marginalia* dans les manuscrits scientifiques byzantins,” in D. Jacquart and Ch. Burnett (eds.), Scientia in margine. *Études sur les marginalia dans les manuscrits scientifiques du Moyen Âge à la Renaissance* (Geneva 2005) 1–25, at 12–13, in particular at 12: “En regard du chapitre 8 du livre II de l’*Arithmétique* de Diophante figure une annotation brève mais explicite : [*translation follows*]”—as we shall see, the annotation is not “en regard” but under a portion of problem 2.8. [↑](#footnote-ref-7)
7. J. Herrin, *Margins and Metropolis* (Princeton 2013) 313, 322, 324. [↑](#footnote-ref-8)
8. A digitalization of the *Matritensis* can be found at http://bdh.bne.es /bnesearch/biblioteca/Diofanto%20de%20Alejandr%C3%ADa: scholium on p.159. [↑](#footnote-ref-9)
9. The scholium runs through the upper and outer margin, as the inner margin is too narrow in the *Matritensis* to be used for writing long an­notations and as problem 2.8 and its alternative proof fill the first 19 of the 29 lines of f. 74v. [↑](#footnote-ref-10)
10. Chortasmenos highlights this fact by preceding the scholium with the clause ἑξῆς εἰς τὸ ια´ θεώρημ(α) τοῦ β(ου), “next, to the 11th theorem of the 2nd” (*sc.* Book 2 of the *Arithmetica*), followed by the cross. The scholium is no. 186 in Allard’s edition. [↑](#footnote-ref-11)
11. This is confirmed by the fact that the scholium is traced in such a way as to avoid some interlinear remarks to 2.8 that are partly contained in the outer margin. [↑](#footnote-ref-12)
12. The sought numbers are often designated by ordinals according to the order in which they appear in the enunciation: “the first,” “the second,” etc. This practice is strictly analogous to our using dummy letters such as *a*, *b*, etc. Note that assigning the ordinals is an entirely different move from as­signing the unknown: this may occasionally coincide with one of the sought numbers (hence, a number that is *also* and *already* designated by an ordinal), but need not do so. [↑](#footnote-ref-13)
13. Recall that the *gamma-rho* compendium can indicate either a variant reading (thus standing for γράφεται) or a correction/conjecture of the copyist or of a scholiast (thus better standing for γράφε or γραπτέον): see N. Wilson, “An Ambiguous Compendium,” *SIFC* Ser. III 20 (2002) 242–243, and “More About γράφεται Variants,” *AAntHung* 48 (2008) 79–81. On the basis of an example taken from the book epigram closing on f. 467v *Vat. gr*. 456 (end of 13th century, Gregory of Nazianzus, *Homilies*), D. Bianconi, “ ‘Piccolo assaggio di abbondante fragranza’. Giovanni Mauropode e il Vat. gr. 676,” *JÖByz* 61 (2011) 89–103, at 100–101, shows that, in the practice of late copyists, the form γράφεται (unambiguous compendium γρ(άφετ)αι in this occurrence) was also used to identify a correction. [↑](#footnote-ref-14)
14. They are at ff. 61r, 61v, 73r, 73v (*bis*), 74r, 74v, 78r (*bis*), 82r, 82v. The margins of the *Matritensis* being severely damaged, it sometimes proves im­possible to read the beginning of a scholium. [↑](#footnote-ref-15)
15. A typical example comes from the very beginning of Book 2 (f. 73r), where the annotation marked by the cross is placed in the blank space on the right of the subscription of Book 1 and of the title of Book 2: it amounts to a short reminder of what a δύναμις is in the *Arithmetica*, a designation that Diophantus introduces and explains in the preface to Book 1. [↑](#footnote-ref-16)
16. *Diophanti opera omnia* I 90.9–10. Fermat’s remark, consigned to the mar­gins of his own exemplar of Bachet’s Diophantus edition of 1621 (*Diophanti Alexandrini Arithmeticorum libri sex*, Paris), states that such a decomposition is impossible whenever, instead of taking square numbers, one takes cubes or any higher powers: “Cubum autem in duos cubos, aut quadratoquadratum in duos quadratoquadratos et generaliter nullam in infinitum ultra quadra­tum potestatem in duos eiusdem nominis fas est diuidere cuius rei demon­strationem mirabilem sane detexi. Hanc marginis exiguitas non caperet” (“It is impossible to separate a cube into two cubes, or a biquadrate into two biquadrates, and generally, *ad infinitum*, any power except a square into two [powers] with the same denomination. I have discovered a truly marvellous proof of this, which however the margin is not large enough to contain”). The annotation is no longer available for autopsy (Fermat’s exemplar is lost); it was printed as *obseruatio domini Petri de Fermat* on p.61 of the text of the *Arithmetica* contained in *Diophanti Alexandrini Arithmeticorum libri sex*, Tolosae 1670, a reprint of Bachet’s edition enriched, among other things, *obser­uationibus D. P. de Fermat Senatoris Tolosani*). [↑](#footnote-ref-17)
17. The solutions of 2.8 are non-integer numbers, but this already occurs in 2.6. [↑](#footnote-ref-18)
18. *Diophanti opera omnia* I 88.20–22. The *Matritensis* has this text, which differs from the one printed in the edition by the omission of ἀριθμῷ after δοθέντι (supplied in parentheses in the translation). Note that any algebraic transcription of this enunciation makes the difficulties contained in the (for­mulation of the) notion “being by a given number greater than in ratio” disappear; cf. the formula at I 289, on which all the subsequent literature depends: *x*12 – *x*22 = *m*(*x*1 – *x*2) + *b*, where *x*1 and *x*2 are the sought numbers (Diophantus calls them in this case “the greater” and “the lesser,” without resorting to ordinals), *m* is the given ratio, and *b* the given number. [↑](#footnote-ref-19)
19. Among the main mathematical authors, it can be found only in Apol­lonius, Book II of the *Loci plani* (only the enunciation has survived, quoted by Pappus at *Coll.* 7.26) and again in Pappus *Coll.* 3.70 (2 occurrences) and 7.187–190 (4 occurrences). [↑](#footnote-ref-20)
20. And as the meaningless correction in Bachet’s 1621 edition (p.84) of ἢ ἐν λόγῳ to καὶ ἐν λόγῳ [δοθέντι] also testifies. [↑](#footnote-ref-21)
21. In particular if compared with the host of analogous glosses that fill the interlinear spaces of the text of 2.8 or of its alternative proof. Chortasmenos corrects also a mistake of the copyist, who omitted the ‘denominator’ of the numerical solution of the problem. [↑](#footnote-ref-22)
22. A “determination” (διορισμός) is the statement of the conditions to be im­posed on the givens of the problem in such a way that a numerical solution of it exists. The determination of 2.7 reads (*Diophanti opera omnia* I 88.26–28) δεῖ δὴ τὸν ἀπὸ τῆς ὑπεροχῆς αὐτῶν τετράγωνον ἐλάσσονα εἶναι συναμ­φοτέρου τοῦ τε τριπλασίονος τῆς ὑπεροχῆς καὶ τῶν δοθεισῶν μονάδων ῑ, “it is required that the square on their [*sc. of the numbers sought*] difference be less than the sum of three times the difference and of the given 10 units.” This condition does not help to understand the meaning of the relation “being by a given number greater than in ratio.” [↑](#footnote-ref-23)
23. Actually, there is only one such scholium, showing by means of an example that the problem does not admit of a solution if its givens do not satisfy the determination. [↑](#footnote-ref-24)
24. *Diophanti opera omnia* II 211.16–212.13. The long Planudean com­mentary on 2.8 (II 212.16–219.10) does not show any particular concern with the possible ‘difficulty’ of this proposition. [↑](#footnote-ref-25)
25. I thank Daniele Bianconi, C. Goldstein, and Inmaculada Pérez Martín for their sug­gestions. [↑](#footnote-ref-26)