THE MISSING LOGIC

TRACES OF A LOST BOOK ON HYPOTHETICAL SYLLOGISTIC IN AVICENNA'S *RISĀLA MŪĞAZA FĪ UṢŪL AL-MANṬIQ*

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Abstract. Do Avicenna's extant works preserve any trace of his now-lost early philosophical production? This paper considers a hitherto neglected text, namely the chapter "On Hypothetical Propositions" from Avicenna's "Concise Treatise on the Principles of Logic" (*Risāla mūğaza fī uṣūl al-manṭiq*, henceforth: *RM*). The new evidence offered by the *RM* chapter in question will lead to a different reading of another well-known passage of Avicenna's reworking of Aristotle's *Prior Analytics* (*Qiyās*) from the "Book of Healing" (*Kitāb al-šifāʾ*). The clues gathered from an analysis of these two works will finally lead us to ponder the possibility that Avicenna may in fact have composed a (now lost) work on hypothetical propositions and syllogisms. Since Avicenna's *RM* is to date unedited, an edition, as well as an English translation of the relevant chapter, is also provided in the Appendix of this paper.

Résumé. Les œuvres existantes d'Avicenne préservent-elles une trace de sa première production philosophique, aujourd'hui perdue ? Cet article examine un texte jusqu'ici négligé, à savoir le chapitre « Sur les propositions hypothétiques » du « Traité concis sur les principes de la logique d'Avicenne » (*Risāla mūğaza fī uṣūl al-manṭiq*, ci-après *RM*). Les nouveaux éléments offerts par le chapitre du *RM* en question conduiront à une lecture différente d'un autre passage bien connu de la réélaboration avicennienne des *Analytiques premiers* (*Qiyās*) d'Aristote dans le « Livre de la guérison » (*Kitāb al-šifāʾ*). Les indices recueillis à partir de l'analyse de ces deux ouvrages nous amèneront finalement à réfléchir à la possibilité qu'Avicenne ait en fait composé un ouvrage (désormais perdu) sur les propositions et les syllogismes hypothétiques. Le *RM* d'Avicenne n'étant à ce jour pas édité, une édition, ainsi qu'une traduction anglaise du chapitre concerné, sont également fournies en annexe de cet article.

1. INTRODUCTION

When surveying the bibliographical lists of works by medieval authors, it is not uncommon to come across titles for which no manuscript witness has survived. In some cases, these works were lost during the lifetime of their author or shortly thereafter; this was, for example, the fate of part of Avicenna's (Ibn Sīnā, d. 427H / 1037) philosophical production. Think of the "Easterners" (*Al-mašriqiyyūn*), partly extant,[1] or the "Fair Judgement" (*Kitāb al-inṣāf*), almost completely lost during the sack of Iṣfahān in 421H / 1030,[2] surviving only in the author's draft. These are not the only cases of works by Avicenna lost due to a lack of manuscript copies drawn from the original draft.[3] One may also recall, in fact, the notorious case of the Aristotelian commentaries that Avicenna had composed in his native country, Buḫārā, to which the scholars of his entourage no longer had access. As his student and secretary Abū ʿUbayd al-Ǧūzǧānī (d. ca. 462H / 1070) reports, these works only existed in one copy, since Avicenna had not kept a clean copy for himself; moreover, the owner of that copy reportedly denied access to it.[4] Ar-

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[1] GS8 in D. Gutas, *Avicenna and the Aristotelian Tradition*, 2nd ed. (Leiden and Boston, 2014), p. 423 and p. 119-44; see also D. Gutas, "Avicenna's Eastern ('Oriental') Philosophy: Nature, Contents, Transmission," *Arabic Sciences and Philosophy*, vol. 10 (2000), p. 159-80 (esp. p. 169-72). Bayhaqī reports having heard that a complete copy of the work had survived in the library of Sulṭān Masʿūd b. Maḥmūd in Ġazna before being destroyed in 546H / 1151-2: see *Tatimmat ṣiwān al-ḥikma*, ed. Moḥammad Shafīʿ (Lahore, 1935), p. 56.4-7.

[2] We know of the circumstances of this event from the "Biography" (W. E. Gohlman [ed. and tr.], *The Life of Ibn Sina: A Critical Edition and Annotated Translation* [Albany, NY, 1974], p. 80-1); Avicenna's letter to Abū Ǧaʿfar Muḥammad Kiyā (1158-1162 Bīdārfar, translated in Gutas, *Avicenna and the Aristotelian Tradition*, p. 54-80; the "Memoirs of a Disciple from Rayy" (MIVa Bīdārfar, translated in Gutas, *Avicenna and the Aristotelian Tradition*, p. 59-67). See D. Reisman, *The Making of the Avicennan Tradition: The Transmission, Contents, and Structure of Ibn Sīnā's Al-mubāḥaṯāt (The Discussions)* (Leiden and Boston, 2002), p. 21-2. Bayhaqī confirms that only part of the *Inṣāf* was extant in his time (*Tatimmat ṣiwān al-ḥikma*, p. 44.6-7).

[3] On this habit, see "Biography of Ibn Sīnā," p. 72-3, where Ǧūzǧānī refers to Avicenna's *Lisān al-ʿarab* (GL17 in Gutas, *Avicenna and the Aristotelian Tradition*, p. 443-4), which could not be edited after the author's death because its sheets were not bound together and there was no clean copy of the work. See also Gutas, *Avicenna and the Aristotelian Tradition*, p. 389 and Reisman, *The Making of the Avicennan Tradition*, p. 21-2.

[4] Bayhaqī claims to have seen a copy of the *Kitāb al-birr wa-l-iṯm* in 544H / 1149-50 in the library of Imām Muḥammad al-Ḥāriṯān al-Saraḫsī (*Tatimmat ṣiwān al-ḥikma*, p. 44.6-7). The copy he describes was reportedly written in a cramped hand with letters difficult to decipher; the possibility that this was indeed Avicenna's draft cannot

guably, Ǧūzǧānī's account refers to the "Available and the Valid" (*Kitāb al-ḥāṣil wa-l-maḥṣūl*)[5] and the "Piety and Sin" (*Kitāb al-Birr wa-l-Iṯm*),[6] the summae on theoretical and practical philosophy that Avicenna had composed in Buḫārā for Abū Bakr al-Baraqī.[7]

My main concern here is whether Avicenna's extant works preserve any significant evidence concerning his now-lost early works. An overview of Avicenna's writings on logic shows that none of his works can be conceived as a closed, self-sufficient system on its own. Each treatise or book – regardless of its extent – appears to form an open system, which is connected to the rest of Avicenna's philosophical output through an intricate network of intertextual references. An analysis of such references may be expected to establish interconnections and parallels between the extant works and between works that are no longer extant; what's more, it may reveal the existence of previously unknown works.

In what follows, I attempt to show that Avicenna's extant works on logic may indeed preserve references to a hitherto unidentified "big book" composed in the first phase of his production. To this end, I start by considering a text neglected up to now, namely the chapter "On Hypothetical Propositions" from Avicenna's "Concise Treatise on the Principles of Logic" (*Risāla mūǧaza fī uṣūl al-manṭiq*, henceforth: *RM*) (section 2).[8] The new evidence offered by this chapter of the *RM* leads us to read in a different light another well-known excerpt of Avicenna's reworking of Aristotle's *Prior Analytics* (*Qiyās*) from the "Book of Healing" (*Kitāb al-šifāʾ*) (section 3). Finally, the clues gathered in the analysis of these two works will lead us to consider the possibility that, before leaving Buḫārā, Avicenna had composed a (now lost) work on hypothet-

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be ruled out. Bayhaqī also reports that Bahmanyār used to read passages from *Al-ḥāṣil wa-l-maḥṣūl* within Avicenna's intellectual circle (*Tatimmat ṣiwān al-ḥikma*, p. 49.7). The value of this latter testimony is controversial, as it openly contradicts Ǧūzǧānī's testimony that the work was lost.

[5] GS10 in Gutas, *Avicenna and the Aristotelian Tradition*, p. 426. As reported by Avicenna himself ("Autobiography," p. 38-9), *Al-ḥāṣil wa-l-maḥṣūl* was a commentary of considerable length, consisting of about twenty volumes.

[6] GPP1 in Gutas, *Avicenna and the Aristotelian Tradition*, p. 94-100 and 498-500.

[7] "Autobiography," p. 38-41. See also Reisman, *The Making of the Avicennan Tradition*, p. 21.

[8] GL2 in Gutas, *Avicenna and the Aristotelian Tradition*, p. 434-5 and no. 116 in Y. Mahdavī, *Fihrist-i nusḫahā-yi muṣannafāt-i Ibn-i Sīnā* (Tehran, 1333H / 1954), p. 222-4. See also D. Gutas, J. Thomann and R. Würsch, "Ibn Sīnā – 3. Werke" in U. Rudolph, R. Würsch (ed.), *Philosophie in der Islamischen Welt, Band 2 / 1: 11. Und 12. Jahrhundert: Zentrale und Östliche Gebiete* (Basel, 2021), p. 25-67 (esp. p. 44).

ical propositions (section 4). Since Avicenna's *RM* is to date unedited, an edition of the relevant chapter, as well as an English translation, is also provided in the Appendix of this paper.

2. THE CHAPTER "ON HYPOTHETICAL PROPOSITIONS" IN AVICENNA'S *RISĀLA MŪĞAZA FĪ UṢŪL AL-MANṬIQ*

2.1. The work and its manuscript tradition

The *RM* is a concise exposition on logic whose text has been handed down to us within four manuscript anthologies containing several works by Avicenna. In this paper I will mainly consider the three that contain the section "On Hypothetical Propositions" of the work.

The earliest of these anthologies is MS İstanbul, Üniversitesi Nadir Eserler Kütüphanesi, A.Y. 4755 (dat. Ramaḍān 588H / September-October 1192), which – according to the marginal annotations found in the codex – derives (either directly or through an intermediary) from the holograph of one of the first-generation disciples of Avicenna, namely Bahmanyār b. Marzubān (d. 458H / 1067).[9]

The second anthology of great historical interest preserving the *RM* is MS İstanbul, Nuruosmaniye Kütüphanesi 4894. Although this volume is undated, it must be earlier than 918H / 1512, as suggested by the presence of the seal of Bāyezīd II (reigned 886-918H / 1481-1512) on f. 597ᵛ.[10] This elegant collection of 144 Avicennian works is a finely crafted book that must have been part of the Ottoman royal library in İstanbul at least until the first half of the 12th / 18th century, as evidenced by the bequest statement in the name of Sultan ᶜUṯmān Ḫān III

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[9] A marginal note at the end of the *RM* (f. 43ᵛ) reads: "The collation with the manuscript from which [this text] was copied has arrived up to this point – the model (*al-umm*) being written by (*bi-ḥaṭṭ*) Bahmanyār, the student of the Šayḫ, may God have mercy of him! – and was corrected as far as possible in Muḥarram 589H [January-February 1193]." For a description of this manuscript, see Reisman, *The Making of the Avicennan Tradition*, p. 45-50.

[10] It is tempting to try to identify this volume in the inventory of holdings of the Top-kapı Palace book collection in İstanbul commissioned by Bāyezīd II from his royal librarian ᶜAtufi in the year 908H / 1502-3. A facsimile edition of the clean copy of the inventory, produced in 909H / 1503-4 (MS Török F. 59 of the Oriental Collection of the Library of the Hungarian Academy of Sciences) is offered in G. Necipoğlu, C. Kafadar, and C. H. Fleischer (ed.), *Treasures of Knowledge: An Inventory of the Ottoman Palace Library (1502/3-1503/4)*, 2 vol. (Leiden and Boston, 2019). The inventory mentions, for instance, at least two *maǧmūᶜāt rasāʾil Ibn Sīnā fī l-manṭiq wa-l-ḥikma al-falsafiyya wa-l-ṭibb wa-ġayrihā* (*Treasures of Knowledge*, vol. 2, p. 233), which might fairly describe the Nuruosmaniye manuscript.

(reigned 1168-71H / 1754-7) and Bešīr Āġā's (d. 1159H / 1746) ownership note with seal.[11]

The third anthology preserving our text is MS İstanbul, Topkapı Sarayı Müzesi, Ahmet III, 3447. Although this manuscript, like the preceding, is undated, it is certainly prior to 918H / 1512, as evidenced by the seal of Bāyezīd II on the last folio. Like the previous one, this exquisite volume was also part of the Ottoman royal library in İstanbul: the title at the outset of this fine anthology of Avicennian texts coincides precisely with one of the titles listed in the inventory realized for Bāyezīd II by the royal librarian ᶜAtufi in 908H / 1502-3.[12]

The structure of the *RM* varies throughout the different witnesses of its manuscript tradition. In its earliest witness, i. e. MS İstanbul, Üniversitesi Nadir Eserler Kütüphanesi, A.Y. 4755 (f. 20^r-43^v), it consists of two treatises: the first covers, roughly, the topics of Porphyry's *Isagoge*, Aristotle's *Categories* and *De interpretatione*, while the second is devoted to the topics of Aristotle's *Prior Analytics*. These two treatises would seem to constitute what I will call the "first core" of the work. An expanded version has also circulated: in MSS İstanbul, Nuruosmaniye Kütüphanesi 4894 (f. 16^v-56^v) and İstanbul, Topkapı Sarayı Müzesi, Ahmet III, 3447 (f. 480^v-566^v), the first core (respectively, f. 16^v-32^r and f. 480^v-512^v) presents an expanded section on the *Prior Analytics* and is supplemented with an additional section on the material covered in Aristotle's *Posterior Analytics* (f. 32^r-56^v and 513^v-566^v); this additional section on the *Posterior Analytics* is also transmitted independently of the rest of the work in MS Tehran, Kitābḫānah-i Markazī-yi Dānišgāh-i Tihrān, Miškāt 1149 (f. 204^v-233^r).[13]

The date of composition of the *RM* is uncertain; as the prologue (only preserved in MS İstanbul, Üniversite 4755, f. 20^r) indicates, it was composed by Avicenna at the request of a hitherto unidentified Abū ᶜOmar Muḥammad b. Ğaᶜfar. Despite the uncertainties concerning the dating of the work, a partial preliminary analysis of the contents suggests that it may belong to the early phase of Avicenna's production.[14] The

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[11] On Bešīr Āġā's active involvement in the intellectual production at the Ottoman court, see J. Hathaway, *Beshir Agha: Chief Eunuch of the Ottoman Imperial Harem* (Oxford, 2005), p. 85-102.

[12] Necipoğlu, Kafadar, and Fleischer (ed.), *Treasures of Knowledge*, vol. 2, p. 233, [356], lines 14-15: *mağmūᶜa min rasāʾil Ibn Sīnā fī l-manṭiq wa-l-ḥikma al-falsafiyya wa-l-ṭibb wa-ġayrihā*.

[13] See H. Eichner, "Al-Fārābī and Ibn Sīnā on 'Universal Science' and the System of Sciences: Evidence of the Arabic Tradition of the *Posterior Analytics*," *Documenti e studi sulla tradizione filosofia medievale*, vol. 21 (2010), p. 71-95.

structure of the treatment of hypothetical propositions in the *RM*, for instance, closely resembles that of the parallel treatment in early works on logic such as the "Middle Summary on Logic" (*Al-muḫtaṣar al-awsaṭ fī l-Manṭiq*), p. 87-93 ed. Yūsufṯānī.[15] Given the uncertain nature of this dating in what follows, however, I will not assume *a priori* an early date for the *RM*.

2.2. Analysis of the chapter "On hypothetical propositions"

The chapter "On Hypothetical Propositions" (*Fī l-qaḍāyā al-šarṭiyya*) is placed at the end of the first treatise of the *RM* – that is, at the end of the first half of the first core of the work. In order to facilitate the understanding of this dense passage, I have divided the text of the chapter, which is edited and translated in the Appendix, into five paragraphs. In what follows, Avicenna's treatment of hypothetical propositions in the *RM* will be broadly outlined following this division into paragraphs. First, I will try to frame the general doctrinal context of the chapter by analysing the paragraphs in which Avicenna presents his theory of hypothetical propositions, namely paragraphs 1, 4, and 5 (section 2.2.1); paragraphs 2 and 3 constitute a digression of extreme interest that will be explored in the next section (section 2.2.2).

2.2.1. Context: Avicenna's theory of hypothetical propositions

The chapter "On Hypothetical Propositions" of the *RM* fits into the general framework of Avicenna's propositional logic – specifically, his theory of hypothetical syllogisms.[16] In what follows, I will read Avicenna's exposition on hypothetical propositions in the *RM* in parallel

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[14] See Eichner, "Al-Fārābī and Ibn Sīnā on 'Universal Science,'" p. 74 concerning the section on Aristotle's *Posterior Analytics*.

[15] GL1 in Gutas, *Avicenna and the Aristotelian Tradition*, p. 433 and no. 108 in Mahdavī, *Fihrist-i nusḫahā*, p. 217-8. See also Gutas, Thomann and Würsch, "Ibn Sīnā – 3. Werke," p. 44. The work is entirely edited: Ibn Sīnā, *Al-muḫtaṣar al-awsaṭ fī l-Manṭiq*, ed. Sayyid Maḥmūd Yūsufṯānī (Tehran, 2017). The section on the *Categories* was also previously edited in: A. Kalbarczyk, "The *Kitāb al-maqūlāt* of the *Muḫtaṣar al-awsaṭ fī l-Mantiq*: A Hitherto Unknown Source for Studying Ibn Sīnā's Reception of Aristotle's *Categories*," *Oriens*, vol. 40 (2012), p. 305-54.

[16] On Avicenna's hypothetical logic, see: N. Rescher, "Avicenna on the logic of 'conditional' propositions," *Notre Dame Journal of Formal Logic*, vol. 4 (1963), p. 48-58; M. Maróth, *Ibn Sīnā und die peripatetische "Aussagenlogik"* (Leiden, 1989); W. Hodges, "Ibn Sīnā's Propositional Logic," talk delivered in 2014 (presentation available at: http://wilfridhodges.co.uk/arabic43.pdf); S. Chatti, "The Semantics and Pragmatics of the Conditional in al-Fārābī's and Avicenna's Theories," *Studia humana*, vol. 6 (2017), p. 5-17; R. Strobino, "Ibn Sina's Logic," *The Stanford Encyclopedia of Philos-*

with that of his major summae, which for brevity will be referred to by the following abbreviations (in alphabetic order):

- *IT*: *Išārāt wa-tanbīhāt*, ed. Sulaymān Dunyā (Cairo, 1960);
- *M*: *Manṭiq al-mašriqiyyīn*, ed. Muḥibb al-Dīn Al-Ḫaṭīb and ᶜAbd al-Fattāḥ Al-Qatlān (Cairo, 1910);
- *N*: *Naǧāt*, ed. Muḥammad Taqī Dānišpažūh (Tehran, 1985);
- *ŠQ*: *Šifāʾ*, *Qiyās*, ed. Saᶜīd Zāyid and Ibrāhīm Madkūr (Cairo, 1964).

As will be observed, from a theoretical standpoint the chapter is consistent with the parallel treatments found in Avicenna's other summae; the treatment of the topic in the *RM* is, however, purposely more concise and less comprehensive.

Paragraph 1 [*ŠQ* V.1-2, 4-5; *N* p. 19.15 – 23.2, 79.8 – 82.2; *M* p. 60.21 – 61.20, 63.1-7, 63.10-17; *IT* p. 270.1 – 271.4, 272.1 – 273.8, 280.1-16]. The section opens with Avicenna's bipartition of hypothetical propositions into conditional (*muttaṣila*) and disjunctive (*munfaṣila*). Both types of hypothetical propositions are then further qualified as universal, particular, indefinite, affirmative, or negative according to the following scheme:

- Hypothetical Propositions (*šarṭiyya*)
    1. Conditional Hypothetical (*šarṭiyya muttaṣila*), "If … then…" (*in … fa-*), e. g. "If the sun rises, it is day."
        (a) Universal (*kulliyya*)
            i. Affirmative (*mūǧiba*), "Always: When it is…" (*kullamā kāna*), e. g. "Always: When the sun rises, it is day."
            ii. Negative (*sāliba*), "Never: When it is…" (*laysa al-battata iḏā kāna*), e. g. "Never: When the sun rises, it is night."
        (b) Particular (*ǧuzʾiyya*)
            i. Affirmative (*mūǧiba*), "It may be, if…" (*qad yakūnu iḏā kāna*), e. g. "It may be, if the sun rises, it is cloudy."
            ii. Negative (*sāliba*), "It may not be, if…" (*qad lā yakūnu iḏā kāna*), e. g. "It may not be, if the sun rises, it is

ophy (Fall 2018 ed.), E. N. Zalta (ed.), https://plato.stanford.edu/archives/fall2018/entries/ibn-sina-logic/; S. Chatti, *Arabic Logic from al-Fārābī to Averroes: A Study of the Early Arabic Categorical, Modal, and Hypothetical Syllogistics* (Basel, 2019), p. 263-347; K. El-Rouayheb, "Mixed Conditional-Categorical Syllogisms from Avicenna to Urmawī," *History and Philosophy of Logic*, vol. 42 (2021), 1-19.

cloudy."

- (c) Indefinite (*muhmal*)
    - i. Affirmative (*mūǧiba*), "If it is so…" (*in kāna*), e. g. "If the sun rises, it is day."
    - ii. Negative (*sāliba*), "Not: If it is so…" (*laysa in kāna*), e. g. "Not: If the sun rises, it is night."
- 2. Disjunctive Hypothetical (*šarṭiyya munfaṣila*), "Either … or…" (*immā … wa-immā*), e. g. "A number is either even or odd."
    - (a) Universal (*kulliyya*)
        - i. Affirmative (*mūǧiba*), "Always: Either it is…" (*dāʾiman immā kāna*), e. g. "Always: Either a number is even or odd."
        - ii. Negative (*sāliba*), "Never: Either it is…" (*laysa al-battata immā kāna*), e. g. "Never: Either this number is even, or it is divisible into two equal parts."
    - (b) Particular (*ǧuzʾiyya*)
        - i. Affirmative (*mūǧiba*), "It may be, either it is…" (*qad yakūnu immā kāna*), e. g. "It may be, either Zayd is in the house, or ᶜAmr is there."
        - ii. Negative (*sāliba*), "It may not be, either it is…" (*qad lā yakūnu immā kāna*), e. g. "It may not be, either a fever is bilious, or it is sanguine."

The classification of hypothetical propositions and the terminology with which it is expressed in the *RM* are compatible with those that are commonly found in Avicenna's most traditional works. It is noteworthy that, in the Logic section of the *Mašriqiyyūn*, Avicenna observes that calling both conditional (1) and disjunctive (2) propositions "hypothetical" (*šarṭiyyāt*) is a traditional use to which he conforms, even though the Arabic language would require that only conditional propositions (1) be properly called "hypothetical," since only in this case does the proposition consist of a hypothesis (i. e., the protasis) followed by an apodosis.[17]

Paragraph 4 [*ŠQ* V.3, VI.1-4; *M* p. 61.22 – 62.4, 62.15-22; *IT* p. 290.1 – 295.3] In the fourth paragraph, Avicenna explores the composition of mixed propositions, which consist of both hypothetical (*šarṭī*) and categorical (*ḥamlī*) propositions or of different types of hypothetical proposi-

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[17] *Manṭiq al-mašriqiyyīn*, p. 60.21 – 61.17. On the differences in Avicenna's logical terminology in the *Qiyās* of the *Šifāʾ* and the corresponding section of the *Mašriqiyyūn*, see S. Chatti, "The Logic of Avicenna between *Al-qiyās* and *Manṭiq al-mašriqiyyīn*," *Arabic Sciences and Philosophy*, vol. 29 (2019), p. 109-31.

tions (i. e. either conditional or disjunctive). The possible combinations between antecedent and consequent, which are hinted at very concisely in the *RM*, correspond to the cases that are more exhaustively detailed in the *Šifāʾ*, *Qiyās* V.3. To summarize, the antecedent and the consequent can be combined in the six ways described in tab. 1 below.

Type (i) represents the simplest case, which is typically used in examples of hypothetical propositions; the propositions that are given as examples in paragraph 1 of the *RM*, for instance, are all type (i) propositions. As evidenced by the comparison in tab. 1, the *RM* reproduces in a nutshell all the cases enumerated in the parallel section of the *Šifāʾ*, albeit in a considerably more condensed form, and without examples.

Paragraph 5 [*ŠQ* V.3; *N* p. 82.4-11; *IT* p. 296.1-2]. In this section Avicenna discusses the possibility that disjunctive and conditional hypothetical propositions consist of multiple parts. To begin with the disjunctive, the classical case is one in which the proposition consists of two parts, as in the example: "Either this number is even or this number is odd" (in the form: $p \vee q$).[18] The parts of the disjunctive can, however, be more numerous (albeit always a finite number; the possibility that they are infinite is merely virtual, never actual). The example given by Avicenna in the *RM* is the following: "Either this number is a pair of even,[19] or <this number is> a pair of odd,[20] or <this number is> a pair of even and odd,[21] or <this number is> an odd prime,[22] or <this number is> an odd composite,"[23] in the form: $p \vee q \vee r \vee s \vee t$.

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[18] Avicenna does not further specify here whether we are to understand the disjunction as exclusive (i. e., the disjunction is true if only one of its arguments is true, to the exclusion of the other) or inclusive (i. e., the disjunction is true if *either or both* of its arguments are true). Nevertheless, it should be noted that the examples he provides seem to point in the direction of the exclusive (a number, for instance, cannot be both even and odd).

[19] E. g. 8, which results from 4 + 4.

[20] E. g. 6, which results from 3 + 3.

[21] E. g. 7, which results from 3 + 4.

[22] E. g. 3.

[23] E. g. 9, an odd number divisible by 3.

TAB. 1: The possible combinations between antecedent and consequent

Šifāʾ, Qiyās V.3 p. 253.4-6	Types of hypothetical propositions (with Avicenna's examples)	*RM,* paragraph 4
(i) Two universal categorical propositions	*Conditional:* [categorical] → [categorical] IF [the sun rises], THEN [it is day] *Disjunctive:* [categorical] ∨ [categorical] EITHER [this number is even] OR [this number is odd]	(i) Two categorical propositions
(ii) Two conditional propositions	*Conditional:* (··· → ···) → (··· → ···) IF (always if [it is day], then [the sun has risen]), THEN (always if [it is night], then [the sun has set]) *Disjunctive:* (··· → ···) ∨ (··· → ···) EITHER (always if [the sun rises], then [it is day]) OR (sometimes if [the sun rises], then [it is not day])	(ii-iv) Two hypotheticals, either conditional (ii) or disjunctive (iii), or one conditional and the other disjunctive (iv)
(iii) Two disjunctive propositions	*Conditional:* (··· ∨ ···) → (··· ∨ ···) IF (either [the body is at rest] or [the body is in motion]), THEN (either [some substances are at rest] or [they are in motion]) *Disjunctive:* (··· ∨ ···) ∨ (··· ∨ ···) EITHER (either [this fever is yellowish] or [this fever is scarlet]) OR (either [this fever is phlegmish] or [this fever is melancholic])	

Šifāʾ, Qiyās V.3 p. 253.4-6	Types of hypothetical propositions (with Avicenna's examples)	*RM*, paragraph 4

(iv) A conditional and a disjunctive proposition	*Conditional:* $(\cdots \to \cdots) \to (\cdots \vee \cdots)$
	IF (always if [the sun rises], then [it is day]), THEN (either [it is day] or [the sun has not risen])
	
	$(\cdots \vee \cdots) \to (\cdots \to \cdots)$
	IF (either [this number is even] or [this number is odd]), THEN (if [this number is even] then [this number is not odd])
	
	Disjunctive: $(\cdots \to \cdots) \vee (\cdots \vee \cdots)$
	EITHER (if [the sun rises], then [it is day]) OR (either [the sun rises] or [it is day])
		(v-vi) A categorical and a hypothetical – either conditional (v) or disjunctive (vi)

(v) A categorical and a conditional proposition	*Conditional:* [categorical] $\to (\cdots \to \cdots)$ IF [the sun is the cause of day], THEN (always if [it is day], then [the sun has risen]) $(\cdots \to \cdots) \to$ [categorical] IF (always if [it is day], then [the sun has risen]), THEN [the sun is the cause of day] *Disjunctive:* $(\cdots \to \cdots) \vee$ [categorical] EITHER (always if [it is day], then [the sun has risen]) OR [the sun is not the cause of day]	
(vi) A categorical and a disjunctive proposition	*Conditional:* [categorical] $\to (\cdots \vee \cdots)$ IF [this is a number], THEN (either [this is even] or [this is odd]) $(\cdots \vee \cdots) \to$ [categorical] IF (either [this is even] or [this is odd]), THEN [this is a number] *Disjunctive:* $(\cdots \vee \cdots) \vee$ [categorical] EITHER (either [this is even] or [this is odd]) OR [this is not a number]	

Note on column 2: I am adopting here the formal analysis offered in Strobino, "Ibn Sina's Logic," *The Stanford Encyclopedia of Philosophy*, section 3.2.1, "Types of hypotheticals" (accessed: February 28, 2022).

Concerning the conditional proposition, Avicenna admits that the antecedent might consist of several parts, as in his example: "If this is so and this is so, then this is so," which may be represented in the form: $(p \land q) \rightarrow r$. Although the antecedent is composed here of two categorical propositions (p and q), the relation of implication between the antecedent and the consequent is only one, since the antecedent functions as a single proposition, as $(p \land q) \rightarrow r$ is not equivalent to: $(p \rightarrow q) \land (p \rightarrow r)$. If, by contrast, the consequent is composed of several parts, the relation of implication does not remain one. The example given by Avicenna in this connection is: "If the sun rises, then it is day and the animals are awake," which can be represented as: $p \rightarrow (q \land r)$. Avicenna's remark – namely that, in this case, each of the two parts of the consequent ("it is day" and "the animals are awake," here represented by q and r) is the apodosis of a different conditional proposition – is best understood by representing his example in the equivalent form: "If the sun rises, then it is day and <if the sun rises, then> the animals are awake," namely: $(p \rightarrow q) \land (p \rightarrow r)$. As is clear from the latter formal representation of this example, there are in fact two conditional propositions involved ("If the sun rises, then it is day" and "If the sun rises, then the animals are awake," respectively $p \rightarrow q$ and $p \rightarrow r$).

2.2.2. Lost books and anonymous theories on hypothetical propositions

Embedded in the treatment of hypothetical propositions of the *RM* that has been outlined in the foregoing are two paragraphs of great historical interest. Paragraphs 2 and 3, which represent a digression within the overall structure of the chapter, make references to doctrines and books that we have not yet been able to attribute and identify with complete certainty.

Paragraph 2. In this paragraph, Avicenna briefly reports the theories of an anonymous philosopher, who he criticises for qualifying conditional propositions as affirmative, and disjunctive propositions as negative. Avicenna argues that a disjunctive proposition is not the negative form of a conditional; on the contrary, there are positive and negative forms of both types of proposition. To prove his case, Avicenna first adduces the example of a conditional hypothetical proposition: "If this is the case, then this is the case" (or: $p \rightarrow q$), the negative form of which is not a disjunctive proposition, but rather another conditional proposition: "Not: if this is the case, then this is the case," which can be formally represented as: $\neg(p \rightarrow q)$. The example involving disjunctives is, in the

affirmative form: "Either this is a number or it is white," namely: $p \vee q$, which is opposed by the negative form: "It is not the case that either this is a number or it is white," namely: $\neg(p \vee q)$.

Apparently, the anonymous philosopher here criticized by Avicenna had difficulty in correctly placing the negation in hypothetical propositions. The view that Avicenna ascribes to him – namely that the disjunctive proposition is the negative form of the conditional proposition – may seem outlandish at first glance; however, it may be better understood by assuming that the philosopher in question may have misinterpreted the logical equivalence between the affirmative disjunctive: $p \vee q$ (e. g. "Either this number is even or odd") and the conditional: $\neg p \to q$ (e. g. "If this number is not even, then it is odd"). The error might thus consist of having further assumed, on this basis, that $\neg p \to q$ (where the negation concerns p) is equivalent to the negative conditional, which is actually formulated as: $\neg(p \to q)$ (e. g. "Not: if the sun rises, it is night"). It should be noted, however, that in the latter case the negation does not accrue to p, but rather to the very implication between p and q. The problem lies, therefore, in determining the scope of the negation.

After accounting for the views of the anonymous philosopher, Avicenna alludes to a book on hypotheticals by Aristotle (*al-faylasūf*, "the Philosopher"), which he believes to be lost in his day. The same book is also mentioned in Avicenna's *Al-muḫtaṣar al-awsaṭ fī l-Manṭiq*:

> Perhaps this was already mentioned in the book that the Philosopher [*viz.* Aristotle] composed on hypotheticals (*al-kitāb allaḏī ʿamalahu al-faylasūf fī l-šarṭiyyāt*), but it is lost and was translated neither in our language, nor in Syriac; it seems that there is no [extant] copy (*nusḫa*) of it in our days [p. 146.7-9, my translation].

As evidenced by the passage above, Avicenna believes that Aristotle also covered the subject of hypothetical propositions with a work specifically devoted to it. This idea, which is frequently expressed in Avicenna's early works,[24] can be traced back as far as Alexander of Aphrodisias (fl. 200 CE), who, in his commentary on the *Prior Analytics*, observed that Aristotle seemingly promised a discussion of certain kinds of hypothetical arguments (in *APr* I.44, 50a39-b2), even though no book by him on hypothetical syllogisms has survived.[25] Based on the testimonies of the

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[24] It is also found in Avicenna's *Al-manṭiq al-mūǧaz* (GL3 Gutas); see M. F. Demirci, "İbn Sînâ'nın 'El-mûcez fi'l-mantık' risâlesi," *M.Ü. İlahiyat Fakültesi Dergisi*, vol. 36 (2009), p. 151-206 (p. 168 and 183).

[25] Alexander, *In analytica priora*, ed. Maximilian Wallies (Berlin, 1883), p. 389.31 – 390.3: "Having dealt with [arguments] based on agreement and *reductiones ad im-*

bibliographical sources on the Arabic transmission of Alexander's commentary on the *Prior Analytics*, it seems unlikely that Avicenna had direct access to an Arabic translation of the section of the commentary in which Alexander discussed the problem.[26] It seems therefore more likely that this information reached him indirectly, through the mediation of other commentaries. A more plausible Arabic source for Avicenna might be al-Fārābī, who, in his commentary on the *De interpretatione*, reported that some commentators ascribed a separate treatment of hypothetical syllogisms (*qawl fī l-maqāyīs al-šarṭiyya*) to Aristotle.[27]

Paragraph 3. Paragraph 3 embodies the core of our argument in this paper. Avicenna appears to refer in this passage to an extensive work (which he characterizes as a "big book," *kitāb kabīr*) on hypothetical propositions and hypothetical syllogisms. Based on what Avicenna reports, the treatment of the topic in the *RM* is a succinct summary of that which was covered more comprehensively in the other book. This reference has so far gone almost entirely unnoticed by Avicennian scholarship; to my knowledge, it was only noted by Mahdavī in his bibliography of Avicenna's works. According to him, the passage is to be understood in reference to the Logic section of the "Book of Healing" (*Kitāb al-šifāʾ*) – implying, consequently, that the *RM* must have been composed later than that section of the *Šifāʾ*:

> If the attribution of this treatise [*viz.* the *RM*] to the Šayḫ is confirmed, then the "big book" denotes the Logic [section] of the "Book of Healing"; the date of composition of this treatise is thus posterior to that of the Logic of The Healing [Mahdavī, *Fihrist-i nusḫahā*, p. 223, my translation].

At first glance, there are no conclusive reasons to discard Mahdavī's hypothesis. As previously stated, the date of composition of the *RM* is dubious, pending the precise identification of the patron who commissioned the work; there is thus nothing that appears to prevent it having

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possibile, [Aristotle] says that many other arguments proceeding from a hypothesis are also conclusive, but he postpones dealing with them, in order to do so more thoroughly later on. However, no work (σύγγραμμα) by him on these [arguments] has survived. Theophrastus mentions these [arguments] in his own *Analytics*, and so do Eudemus and some others among his companions."

[26] Ibn al-Nadīm ascribes two commentaries on the *Prior Analytics* to Alexander; both commentaries, however, seem to be known in Arabic only up to the section on the assertoric figures (reading *al-aškāl al-ḥamaliyya* instead of *al-aškāl al-ǧumliyya*) – that is, up to *APr* I.7; see *Fihrist*, ed. Gustav Flügel, vol. 1 (Leipzig, 1871), p. 249. Based on this testimony, the passage of Alexander's commentary in question would fall largely outside this section.

[27] *Alfarabi's commentary on Aristotle's Peri hermēneias (De interpretatione)*, ed. Wilhelm Kutsch and Stanley Marrow (Beirut, 1971), p. 53.9-12.

been composed somewhat after the *Šifāʾ*. In addition, indefinite references to extensive and detailed books are frequently found in the corresponding sections on hypothetical propositions and syllogisms of the *Naǧāt* and the *Išārāt*, alternating with explicit references to the *Šifāʾ*;[28] thus it would seem possible that Avicenna also refers in the *RM* to a section of the *Šifāʾ*. An as-yet unnoticed reference in the *Šifāʾ*, however, may prove to be the decisive evidence needed to challenge Mahdavī's hypothesis and propose a different identification of the work mentioned in the *RM*. In the following section of this paper, I will suggest a different interpretation of a very well-known passage from the *Qiyās*, based on a variant reading preserved in the manuscript tradition that has so far remained undetected.

3. LOST BOOKS ON HYPOTHETICAL PROPOSITIONS

The passage that seals Avicenna's treatment of hypothetical syllogisms in *Qiyās* VI.6, which – contrary to the corresponding one in the *RM* – has so far been in the spotlight, may perhaps tell a different story from the one we know from the interpretations that have been given of it so far. I will begin by providing a translation of the passage according to the Cairo edition:

> We have accomplished the concise discourse on hypothetical propositions and their syllogisms which we included [in this book]. In our [native] country we had already come to know a big, expanded book (*kitāban kabīran mašrūḥan*) on this subject of which we have lost sight in our travels and departures for our affairs. However, it might still be in the country in which we were. After we figured out this part of the science over approximately eighteen years, we came across a book on hypotheticals (*kitāb fī l-šarṭiyyāt*) ascribed to an eminent later [scholar] (*fāḍil al-mutaʾaḫḫirīn*). However, it appears to be spurious (*manḥūl ʿalayhi*), as it is neither clear nor reliable […] [*Šifāʾ*, *Qiyās* VI.6, p. 356.7-12, my translation].

The first remarkable point is Avicenna's claim that his exposition on the syllogisms composed of hypothetical premises in the *Šifāʾ* is a *concise* exposition (*al-kalām al-muḫtaṣar*). If taken at face value, this statement

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[28] Regarding the issue of hypothetical propositions syllogisms, indefinite references to "the big books" (*al-kutub al-kabīra*) are found, for instance, in *Naǧāt* p. 68.2-4; to "the more extensive books" (*al-kutub al-mabsūṭa*) in *Naǧāt* p. 84.8-12, p. 86.13 – 87.1, p. 87.11-12 and p. 90.2-5; an indefinite reference to works that are not in the form of a summary (*al-muḫtaṣar*) is found in the section on hypothetical syllogisms in *Išārāt*, Nahj 8, chap. 1, p. 494. Definite references to the "Book of Healing" and the "Book of Appendices" (*Kitāb al-lawāḥiq*) are found in *Naǧāt* p. 84.13 – 85.1 and, to the "Book of Healing" and other works of Avicenna, in *Išārāt*, Nahj 8, chap. 1, p. 483.

is quite surprising, if we consider that the *Šifāʾ* contains by far the most complete and comprehensive exposition on the subject that we have.

The second point that should be noted is that, in the subsequent lines, Avicenna refers to two books – neither yet identified – devoted to hypothetical propositions and syllogisms. The first – which will henceforth be referred to as Book 1 – is reported to be located in Avicenna's country of origin, Buḫārā. The second (henceforth, for the sake of brevity: Book 2) is a book ascribed to an anonymous scholar that Avicenna came across after mastering the topic; in this section, Avicenna reports and refutes several theories contained therein.

3.1. *Book 2 – the book by the "eminent later scholar"*

An anonymous author, to whom Avicenna often refers as an "eminent later scholar" (*fāḍil al-mutaʾaḫḫirīn*) in the *Qiyās*, is credited in the passage from *Qiyās* VI.6 quoted above with a work specifically devoted to hypotheticals, which we call here Book 2. As for the identity of the anonymous author, contemporary scholarship has first attempted to identify him with Alexander of Aphrodisias.[29] This identification has since been called into question; more recently, the hypothesis has been put forward – supported by a great deal of textual evidence – that the "eminent later scholar" might rather be identified with a leading scholar in the Arabic tradition, namely Abū Naṣr al-Fārābī (d. 339H / 950).[30] In what follows, I intend to propose an identification of the "eminent later scholar" in question with Avicenna's polemical target in paragraph 2 of the *RM*. I would argue that there are evident parallels in the points singled out for criticism in the works of the two anonymous scholars that Avicenna addresses in the *RM* and in the *Šifāʾ*: see tab. 2.

[29] I. Madkour, *L'Organon d'Aristote dans le monde arabe*, 2nd ed. (Paris, 1969), p. 37, 186-7; N. Shehaby, *The Propositional Logic of Avicenna – A translation from Al-shifāʾ: Al-qiyās with Introduction, Commentary and Glossary* (Dordrecht and Boston, 1973), p. 6-7; Maróth, *Ibn Sīnā und die peripatetische "Aussagenlogik"*, p. 7.

[30] T. Street, "'The Eminent Later Scholar' in Avicenna's *Book of the Syllogism*," *Arabic Sciences and Philosophy*, vol. 11 (2001), p. 205-18, followed by Chatti, *Arabic Logic from al-Fārābī to Averroes*, p. 100.

TAB. 2: Parallels between *Šifāʾ*, *Qiyās* VI.6 and *RM*

Šifāʾ, *Qiyās* VI.6, p. 356.11 – 357.4 (transl. Shehaby, *The Propositional Logic of Avicenna*, p. 159, slightly modified)	*RM*, paragraph 2 in the Appendix
(i) It [*viz.* the book] is neither clear nor reliable [...]. The student should not pay any attention to it—it is distracting and misleading. For the author did not know what makes hypothetical propositions affirmative, negative, universal, particular, and indefinite;	(i) One of those who intended to provide an account of hypotheticals believed that the conditional [premise] is affirmative, while the disjunctive is negative, but he made a huge mistake, for the negative removes the affirmative.
(ii) nor did he know how hypothetical propositions oppose or contradict each other. *	(ii) Then if someone says: "If this is the case, then that is the case," † whoever denies and refutes [this claim] does not oppose it by a disjunctive. ‡ Rather, he says: "Not: if this is the case, then that is the case", § thus removing the implication. Likewise, if someone says: "Either this is a number or it is white," ‖ then the person rejecting [this claim] does not contradict it by a conditional; rather, he says: "Not: either it is this or that." ‖
(iii) On the other hand, he gave unnecessary additional conjunctions of conditional and disjunctive premisses because he treated certain things which follow one rule as though they follow different rules. He could have given the general rule which all of them follow.	(iii) Besides not adding, with regard to hypothetical [propositions] and the syllogisms that are formed of them, anything but prolixity to what people [already] had, that man [also] made a huge mistake concerning things similar to those I have mentioned.

Notes: * Cf. also *Qiyās* V.1, p. 233.4-5: "Some of them said: Condition stands for an affirmation and disjunction for negation." By "condition" I translate here the Arabic *al-ittiṣāl* (*lit.* "conjunction"); this choice of translation is motivated by the fact that here the term is used with reference to conditional (*muttaṣila*) propositions. † In the form: $p \rightarrow q$. ‡ Avicenna arguably refers to the affirmative disjunctive: $p \vee q$ (e.g. "Either this is the case or that is the case"), which is logically equivalent to: $\neg p \rightarrow q$ (e.g. "If this is not the case, then that is the case"). § In the form: $\neg(p \rightarrow q)$. ¶ In the form: $p \vee q$. ‖ In the form: $\neg(p \vee q)$.

Among the errors that Avicenna blames on the "eminent later scholar" in the *Qiyās* are three that are substantially compatible with those blamed on the anonymous scholar in the *RM*, namely: (i) failing to understand how hypothetical propositions can be affirmative and negative; (ii) failing to understand how hypothetical propositions oppose each other; and (iii) needlessly dwelling on trivial issues.[31] The "eminent later scholar" to whom Avicenna attributes Book 2 in the *Šifāʾ* might thus correspond to the anonymous scholar Avicenna critically addresses in the *RM*. If this identification is correct, Avicenna also implicitly refers to Book 2 in the *RM*.

It should be noted at this point that, although Avicenna's tone towards the "eminent later scholar" is critical in both the *Qiyās* and the *RM*, in the latter work it sounds exceptionally contemptuous. In the *RM*, Avicenna refers to the said scholar without any title of courtesy or regard – the anonymous author is referred to just as "that man" (*ḏālika al-raǧul*), in a tone usually reserved for personalities whom Avicenna held in very low esteem – whereas in the *Qiyās* he was at the very least given the title of "eminent scholar." Although the identification of many of the references to the "eminent later scholar" disseminated in the *Qiyās* with Fārābī sounds convincing, this particular case leads us to wonder whether Avicenna would have intentionally addressed him in such an openly derogatory manner. The case of Book 2, however, might represent an exception among all the other references to the "eminent later scholar" found in the *Qiyās*. This is proven by the fact that *Qiyās* VI.6 is the only place in which Avicenna mentions Book 2 qualifying it as a work specifically devoted to hypothetical syllogisms and attributing it to the "eminent later scholar;" in all the other passages, he seems to be referring to a different work by the same scholar – in all likelihood, a commentary on the *Prior Analytics*. Secondly, in *Qiyās* VI.6 Avicenna expressly doubts the attribution of Book 2, which he believes to be incorrectly attributed to the "eminent later scholar."[32] It seems thus legitimate to ask whether Avicenna allows himself to be more openly critical of Book 2 in the *RM* precisely because of his doubts about the attribution of this work on hypotheticals to the "eminent later scholar" (i. e., to Fārābī). My suggestion is that Avicenna may ultimately have suspected that Book 2 was, in fact, to be attributed to another scholar, possibly an exponent of the Peripatetic school of Baġdād. According to coeval bibliographical sources, hypothetical syllogistic was a subject that received

[31] On points (i) and (ii), see section 2.2.2 above.
[32] See the translation of *Šifāʾ*, *Qiyās* VI.6, p. 356.7-12 above.

attention in the Baġdād school: Abū Bišr Mattā b. Yūnus (d. 328H / 940), for instance, is credited with a specific book on hypothetical syllogisms (*Kitāb al-maqāyīs al-šarṭiyya*) in Ibn al-Nadīm's *Fihrist*,[33] and a few annotations on the Arabic translation of the *Prior Analytics* in the famous "Arabic *Organon*" (MS Paris, BnF, ar 2346) also deal with hypothetical syllogisms.[34] Assuming that Avicenna might strongly suspect a different attribution for Book 2 (most likely to an exponent of the Baġdād school) would better account for his excessively dismissive attitude towards its author in the *RM*.

3.2. Book 1 – a hitherto unknown work by Avicenna?

Scholarship has focused so far on Book 2 in an attempt to identify its author; Book 1, on the other hand, has gone almost entirely under the radar.[35] In what follows, I will shift the focus onto Book 1, arguing that it might be a hitherto unknown work composed by Avicenna in Buḫārā. The first reference to a book specifically devoted to this topic is that found in paragraph 3 of the *RM*, which Mahdavī identified with the corresponding section of the *Šifāʾ*. As I will try to demonstrate, the corresponding section of the *Šifāʾ* itself might, in fact, point to the existence of a hitherto unknown book composed by Avicenna during the early phase of his career. A hint in this direction can be found in the very passage from *Qiyās* VI.6 that we have been considering here, even though, due to a philological subtlety, it is not immediately visible in the Cairo edition of the text. A not negligible number of the earliest manuscripts of the work[36] present, in fact, an interesting textual variant, which is unfortunately not recorded in the apparatus of the Cairo edition (see, for instance, fig. 1); according to it, the meaning of Avicenna's statements concerning Book 1 changes radically. In tab. 3, I first reproduce and translate the text as edited in the Cairo edition (A); then, I propose a different text based on the new textual variant (B).

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[33] Ibn al-Nadīm, *Fihrist*, vol. 1, p. 264.

[34] See, for instance, the note in red ink ascribed to Abū Bišr (Mattā) on f. 129[r].

[35] See Shehaby, *The Propositional Logic of Avicenna*, p. 25, note 30 on the difficulties of the identification of this book; Shehaby tentatively suggests that this book might be the translation of a Greek commentary.

[36] To my knowledge, this variant reading is found at least in MSS Leiden, Universiteitsbibliotheek, Or. 4, f. 72[v]; Cairo, Maktabat al-Azhar al-Šarīf, Beḫīt 331 *falsafa* (*ḫuṣūṣiyya*), 44988 (*ᶜumūmiyya*), f. 109[r]; İstanbul, Süleymaniye Kütüphanesi, Damad İbrahim Paşa 822, f. 67[r]; İstanbul, Nuruosmaniye Kütüphanesi, 2710, f. 61[v] (as a marginal variant).

TAB. 3: An interesting textual variant

(A) Šifāʾ, Qiyās VI.6, p. 356.7-9, Cairo ed.	(B) Šifāʾ, Qiyās VI.6, p. 356.7-9, new textual proposal

(A) فقد أدينا ما حصناه من الكلام المختصر في القضايا الشرطية وقياساتها. وقد أسفارنا. كنا علمنا في هذا الباب في بلادنا كتابا كبيرا مشروحا غاب عنا في أسفارنا ومفارقاتنا لأسبابنا وكانه موجود في البلاد التي كنا بها.

We have accomplished the concise discourse on hypothetical propositions and their syllogisms which we included [in this book]. In our [native] country we had already *come to know* a big, expanded book on this subject of which we have lost sight in our travels and departures for our affairs. However, it might still be in the country in which we were.

(B) فقد أدينا ما حصناه من الكلام المختصر في القضايا الشرطية وقياساتها. وقد أسفارنا. كنا عملنا في هذا الباب في بلادنا كتابا كبيرا مشروحا غاب عنا في أسفارنا ومفارقاتنا لأسبابنا وكانه موجود في البلاد التي كنا بها.

We have accomplished the concise discourse on hypothetical propositions and their syllogisms which we included [in this book]. In our [native] country we had already *composed* a big, expanded book on this subject of which we have lost sight in our travels and departures for our affairs. * However, it might still be in the country in which we were.

Note: * I wonder whether, instead of *fī asfārinā wa-mufāriqātinā li-asbābinā*, one should read: *fī asfārinā wa-mufāriqātinā li-ašyāʾinā* ("in our travels and separations from our belongings"), by modifying the diacritics of *asbābinā*. This variant reading would refer to the fact that, during some of his travels, Avicenna actually left some of his possessions behind, and would be more effective in explaining why Avicenna lost sight of the book he refers to in this passage. In the manuscripts that I have checked so far, however, the *rasm* is always noted as *asbābinā*.
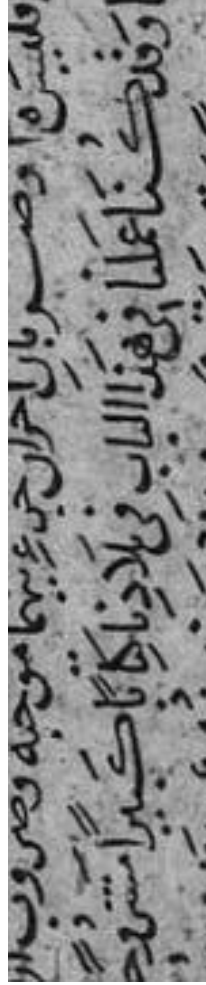

FIG. 1: MS Damad İbrahim Paşa 822, f. 67r, detail with the variant reading *ʿamalnā*

The two attested variant readings in bold in the table above – namely, ʿalimnā ("we have come to know") and ʿamalnā ("we have composed") – are very close from a palaeographic point of view.

As evidenced by comparing "versions" A and B of the passage, however, a minor inversion of letters in the Arabic – such as that which occurs between ʿalimnā and ʿamalnā – leads to a completely different interpretation of the passage in question. While in version A, the book Avicenna is talking about is merely an anonymous work he had *come across* in his native country, in version B it becomes a work *composed* by Avicenna himself in the earliest phase of his philosophical production. While deciding between the two variants, which are both attested in the manuscript tradition, might at first seem difficult, paragraph 3 of the *RM* could represent the relevant parallel passage that tips the scale in favour of version B. Within the framework of this new interpretation, Avicenna would thus refer in both the *RM* and the *Qiyās* to a book specifically dedicated to the subject he had composed in his native country and had subsequently lost sight of. The book in question must have been particularly extensive, since even the exposition in the *Qiyās* of the *Šifāʾ* is described as "concise" in comparison to it; unfortunately, this is all we get to know about this mysterious work from the passages we have analysed so far.

4. DID AVICENNA EVER WRITE A BOOK "ON HYPOTHETICALS?"

At present, no manuscript witness of a work "On Hypotheticals" by Avicenna seems to be extant. This is not per se a compelling argument against the existence and authenticity of this work, since Avicenna himself appears to refer to it on two occasions (i. e., in the *Qiyās* of the *Šifāʾ* and in the *RM*). However, at least one troublesome question remains to be answered, namely why – if Avicenna did write such a book – is there no mention of it in any of the medieval lists of Avicenna's works, that is, the bibliographies that were compiled within two centuries of his death. Four main bibliographic lists of Avicenna's works have so far been identified: the first derives from the complex of texts formed by his "Autobiography" and "Biography;" it is the earliest and most succinct list of his works.[37] The others are the so-called "Shorter Bibliography,"[38] "Longer

[37] Gutas, *Avicenna and the Aristotelian Tradition*, p. 391-2.

[38] The main sources of this bibliographical list are the *ṭabaqāt* works by Bayhaqī, Ibn al-Qifṭī and Ibn Abī Uṣaybiʿa; see Gutas, *Avicenna and the Aristotelian Tradition*, p. 392-6.

Bibliography,"[39] and "Extended Bibliography,"[40] which present lists of works of varying lengths, which are increasingly richer and more detailed. Although these lists include titles that have yet to be positively identified, none seems to refer to a work specifically devoted to hypotheticals.[41]

Ascribing a work on hypothetical propositions and syllogisms to Avicenna on the basis of his vague references in the *Qiyās* and the *RM* prompts an attempt to explain why the compilers of the standard Avicennian bibliographies were not familiar with it in the first place. Two possible explanations come to mind: the first is that the work may never have come into circulation, having been lost during Avicenna's lifetime, for Avicenna himself does not appear to have reliable information on where it was preserved. As for Avicenna's own references to the work, they are so rare and elusive that they might have passed unnoticed – in fact, the one in the *Qiyās* is disguised by a palaeographic corruption in many manuscript witnesses, while that in the *RM* might have been taken for a reference to another extant work. The second possible explanation is that the work may have been part of one of the early comprehensive books that are mentioned in the bibliographies, as well as in other accounts of Avicenna's life. One may wonder, for instance, if the book in question was part of *Al-ḥāṣil wa-l-maḥṣūl*, composed in Buḫārā for Abū Bakr al-Baraqī.[42] Although in his references Avicenna seems to allude to a stand-alone composition devoted to hypotheticals, the possibility that the book was in fact a section of a larger summa cannot be ruled out a priori in the absence of further evidence.

In conclusion, one can only hope that future research into the numerous largely unexplored collections of Arabic manuscripts around the world may provide further material evidence to shed light on the ques-

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[39] This list appears in MS İstanbul, Üniversitesi Nadir Eserler Kütüphanesi, A.Y. 4755 (f. 308ʳ-317ᵛ) and in Ibn Abī Uṣaybiʿa's *ʿUyūn al-anbāʾ fī ṭabaqāt al-aṭibbāʾ*; see Gutas, *Avicenna and the Aristotelian Tradition*, p. 396-9.

[40] This list is found at the end of Avicenna's entry in some of the manuscripts of Bayhaqī's *Tatimma*; see Gutas, *Avicenna and the Aristotelian Tradition*, p. 399-400.

[41] Even the titles yet to be precisely identified and labelled as potentially pseudo-epigraphs by Gutas do not seem to refer to a work specifically devoted to the topic. The title that is perhaps closest in theme (*Al-qiyās*, GL-Ps3) applies to a response attributed to Avicenna within an epistolary exchange – and not, therefore, to a monographic work. See Gutas, *Avicenna and the Aristotelian Tradition*, p. 441-2.

[42] Avicenna explicitly refers to the other summa composed for al-Baraqī, namely the *Kitāb al-birr wa-l-iṯm*, in the Metaphysics section of the *Šifāʾ*: see *Ilāhiyyāt*, vol. 2, ed. Muḥammad Yūsuf Mūsā, Sulaymān Dunyā, and Saʿīd Zāyid (Cairo, 1960), X.1, p. 439.7-8.

tion concerning the existence and nature of the work to which Avicenna refers in the *Qiyās* and the *RM*. In the meantime, the careful examination of similar references in Avicenna's remaining works can pave the way for the identification of other authentic works that have so far escaped our attention.

5. APPENDIX

The text edited below is the chapter "On hypothetical propositions" of *Al-risāla al-mūǧaza fī uṣūl al-manṭiq* [GL2] by Ibn Sīnā. Three manuscripts were employed:

• اİstanbul, Üniversitesi Nadir Eserler Kütüphanesi, A.Y. 4755 (dat. Ramaḍān 588H / September-October 1192), f. 36ʳ-37ᵛ;

• بİstanbul, Nuruosmaniye Kütüphanesi 4894 (not dated; earlier than 918H / 1512, as suggested by the seal of Bāyezīd II [reigned 886-918H / 1481-1512] on f. 597ᵛ; the manuscript also presents a bequest statement in the name of Sultan ʿUṯmān Ḫān III [reigned 1168-71H / 1754-7] and Bešīr Āġā's [d. 1159H / 1746] ownership note with seal), f. 20ᵛ-21ʳ;

• جİstanbul, Topkapı Sarayı Müzesi, Ahmet III, 3447 (undated; prior to 918H / 1512, as suggested by the seal of Bāyezīd II [reigned 886-918H / 1481-1512] on the last folio; probably also earlier than 908H / 1502-3, as the volume is seemingly listed in the inventory realized by the royal librarian ʿAtufi), f. 488ᵛ-489ᵛ.

Although the textual sample analysed here is too small to establish a definitive *stemma codicum*, it can at least be asserted that the manuscript tradition is divided into two families, one represented by ا and the other represented by ب and ج. As a consequence, when choosing among the textual variants, the agreement of ا and ب against ج or of ا and ج against ب has been considered as conveying the correct reading. In case of opposition between the two branches, the choice of the correct reading could not be made mechanically, but had to be based on a thorough analysis of the context.

Concise Treatise on the Principles of Logic
Avicenna

On Hypothetical Propositions

[1. Classification of hypothetical propositions]

Hypothetical propositions are of two types and kinds: one is that of conditional [hypotheticals], the other is that of disjunctive [hypotheticals].

Conditional is the one in which the judgement consists in that one proposition either necessarily implies the other or not. Implication here is the equivalent of affirmation in categorical [propositions], while non-implication is the equivalent of negation. The implicant is called "antecedent," and the implicate is called "consequent." The hypothetical particle[43] attaches to the implicant, whereas the particle of the apodosis[44] attaches to the implicate, like when we say: "If the sun rises" – this being the antecedent – "then it is day" – this being the consequent. The implication may be universal, as when you say: "Always: when it is so;" the removal of the implication may also be universal, as when you say: "Never: when it is so;" the implication will also be particular, as when you say: "It may be the case: if it is so," as well as the removal of the implication, as when you say: "It may not be the case: if it is so." They may also be indefinite, as when you say: "If it is so" and "not: if it is so;" in this case too, there are a universal and a particular affirmative, as well as a universal and a particular negative, and two indefinite.

Disjunctive is the one in which the judgement concerns the contradiction or the non-contradiction between one proposition and another, or several others. Contradiction is the affirmation, while non-contradiction is the negation. The [clause] contradicted is the antecedent, while the [clause] contradicting [it] is the consequent. An example of that is: "Either this number is even" – which is the antecedent – "or odd" – which is the consequent. There can be a universal affirmative [disjunctive proposition], like when you say: "Always: either this is…," as well as a universal negative, like when you say: "Never: either this is…;" [there is also] a particular affirmative and negative, like when you say: "Sometimes: either this is such-and-such…" and "Sometimes not: either this is such-and-such…"

[43] I. e. *in* ("if") or *iḏā* ("when"). On the different degrees of implication that these particles may express, see *Šifāʾ*, *Qiyās* V.1, p. 235.2-12, and Chatti, "The Semantics and Pragmatics of the Conditional,", p. 11.

[44] I. e. the particle *fa-* ("then").

في القضايا الشرطية

(١)

وأمّا القضايا الشرطيّة فإنّها على جهتيْن وجنسيْن: أحد الجنسيْن جنس المتّصل والآخر جنس المنفصل.

والمتّصل هو الذي الحكم فيه لزوم أو لا لزوم قضية لقضية. | واللزوم هاهنا نظير الإيجاب في الحمليّات واللّا لزوم نظير السلب. والملزوم يسمّى مقدّمًا واللازم يسمّى تاليًا والملزوم يقرن | به حرف الشرط واللازم يقرن به حرف الجزاء كقولنا: إن كانت الشمس طالعة – وهو المقدّم – فالنهار موجود – وهو التالي. وقد يكون اللزوم كلّيًا كقولك: كلّما كان، ورفع اللزوم كلّيًا كقولك: ليس البتّة إذا كان؛ وسيكون اللزوم جزئيًا كقولك: قد يكون إذا كان. ورفع اللزوم جزئيًا كقولك: قد لا يكون إذا كان. وقد يكونان مهمليْن كقولك: إن كان وليس إن كان فهاهنا أيضًا موجبة كلّية وجزئية، سالبة كلّية وجزئية، ومهملتان.

وأمّا المنفصلة فهي التي الحكم فيها بمنافاة قضية لقضية أو لقضايا أو لا منافاتها. والمنافاة إيجاب واللّامنافاة سلب. والمنافيَ مقدّم والمنافي | تال. مثال ذلك: إمّا أن يكون هذا العدد زوجًا – وهو المقدّم – وإمّا فردًا – وهو التالي. وقد يكون هاهنا كلّية موجبة كقولك: دائمًا إمّا أن يكون، وكلّية سالبة كقولك: ليس البتّة إمّا أن يكون؛ وجزئية موجبة وسالبة كقولك: قد يكون إمّا كذا وقد لا يكون إمّا كذا.

٢ وأمّا: أما [أ]. ٢ والآخر: والثاني [ب، ج]. ٤ واللزوم: واللازم [أ]. ٥ واللّا: ولا [ب، ج]. ٧ التالي: الجزء الثاني ("التالي" بعد التصحيح) [أ]. ٧ كقولك: كقولنا [أ]. ٨ وسيكون: ويكون [ب، ج]. ١٠ فهاهنا: هاهنا [أ]. ١٠ كلّية (الثاني): – [أ]. ١٢ بمنافاة: بمنافات [أ]. ١٣ والمنافاة: والمنافات [أ]. ١٣ إيجاب: الإيجاب [أ]. ١٣ واللّامنافاة: واللامنافات [أ]. ١٣ سلب: السلب، تحت السطر [أ]. ١٤ وهو (الأوّل): فهو [ب، ج].

[2. Criticism of the author of a book on hypotheticals
(the "eminent later scholar?")]

One of those who intended to provide an account of hypotheticals be-
lieved that the conditional [premise] is affirmative, while the disjunctive
is negative, but he made a huge mistake, for the negative removes the
affirmative. Then if someone says: "If this is the case, then that is the
case," whoever denies and refutes [this claim] does not oppose it by a dis-
junctive. Rather, he says: "Not: if this is the case, then that is the case,"
thus removing the implication. Likewise, if someone says: "Either this
is a number or it is white,"[45] then the person rejecting [this claim] does
not contradict it by a conditional; rather, he says: "Not: either it is this or
that." Besides not adding, with regard to hypothetical [propositions] and
the syllogisms that are formed of them, anything but prolixity to what
people [already] had, that man [also] made a huge mistake concerning
things similar to those I have mentioned. The reason for this is that peo-
ple have lost a work by the Philosopher [*viz.* Aristotle] on hypothetical
[propositions].[46]

[3. Reference to an earlier work on hypotheticals by Avicenna]

As for us, we have already discovered, concerning the states of their
propositions and the composition of syllogisms out of them [*viz.* out of
hypotheticals], what we hope to have thoroughly examined in a long book
we have composed; here, however, we seek brevity.

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[45] Cf. Avicenna's examples of false disjunctives: "the number is either black or white"
in *Dānišnāmah-yi ʿAlāʾī, Manṭiq*, ed. Moḥammad Moʿīn (Tehran, 1954), p. 33.7-8
and "it is not the case that number is either even or white; rather, it is either even
or odd" at p. 52.5-6.

[46] Avicenna seems to have believed that Aristotle had composed a book on hypotheti-
cals; see section 2.2.2 above.

(٢)

وواحد مِمَّن أراد أن يحدّث في الشرطيّات شيئًا ظنّ أنّ المتّصلة موجبة وأنّ المنفصلة سالبة ولقد غلط غلطًا عظيمًا فإنّ السالبة يرفِع الموجبة. ثمّ إذا قال قائل: إن كان كذا كان كذا، فرافعه ودافعه لا يناقضه بمنفصلة، بل يقول: ليس إن كان كذا كان كذا، بل يرفع اللزوم؛ وكذلك إذا قال قائل: إمّا أن يكون هذا عددًا وإمّا أن يكون بياضًا، فإنّ مبطله لا يناقضه بمتّصلة بل يقول: ليس إمّا أن يكون هذا وإمّا أن يكون ذلك. وذلك الرجل مع أنّه لم يُفِد في الشرطيّات والقياسات الكائنة منها إلّا تطويلًا لما في أيدي الناس فقط فإنّه أخطأ كثيرًا في ما أشبه ما حكيته، والسبب في هذا ما ضاع عن أيدي الناس من تصنيف الفيلسوف في الشرطيّات.

(٣)

وأمّا نحن فقد استنبطنا من أحكام قضاياها ومن تأليف القياسات عنها ما نرجو أن نكون استقصينا وذلك في كتاب كبير عملناه؛ | وأمّا هاهنا فمن غرضنا الاختصار.

أ٣٧و

[4. Mixed syllogisms]

We thus say: Since both conditional and disjunctive hypotheticals are composed of propositions by way of implication or contradiction, this is possible for any proposition whatsoever, so that the antecedent and the consequent can be two categorical [propositions]; or a categorical and a hypothetical (either conditional or disjunctive), regardless of which one is the consequent and the other the antecedent. The antecedent and the consequent can also be two hypotheticals (either conditional or disjunctive, or one conditional and the other disjunctive). Moreover, they can also be both indefinite, affirmative and negative, or one affirmative and one negative, and both universal or particular, or one universal and one particular; the same goes for the other judgements. There is no different judgement for the hypothetical, as that man that we mentioned [above] believed; on the contrary, [the hypothetical] is indefinite, universal and particular, negative and affirmative, conditional and disjunctive by virtue of the particles of the condition. In this connection, it is not useful [to know] the state of antecedent or consequent, since an affirmative can be derived from two negatives, as when you say: "If no man is an animal, no man is sensible," for this positively affirms the implication between the two propositions; and like when you say: "Not: if the sun rises, then it is day," for this is negative even though the two propositions are affirmative. Analogous is the case of disjunctive. So, this is a summary for you, on the details of which this book will not linger.

(٤)

فنقول: لمّا كانت الشرطيّات متّصلها ومنفصلها مؤلّفة من قضايا على سبيل لزوم أو

منافاة فجائز أن يكون عن أيّ القضايا كانت فيجوز أن يكون المقدّم والتالي | حمليّين ج٤٨٩ظ

وجائز أن يكون حمليًا وشرطيًا متّصلًا ومنفصلًا أيّهما كان تاليًا والآخر مقدّمًا. وجائز أن

يكون المقدّم والتالي شرطيّين متّصلين أو منفصلين أو أحدهما متّصلًا والآخر منفصلًا

٥ وبعد ذلك فيجوز أن يكونا مهملين موجبين وسالبين أو موجبًا وسالبًا وكلّيين وجزئيّين وكلّيًا

وجزئيًا وكذلك في سائر الأحكام فلا يكون من ذلك حكم متغيّر البتّة في الشرطي –

كما ظنّه هذا الرجل الذي ذكرناه – بل هو مهمل وكلّي وجزئي وسالب وموجب ومتّصل

ومنفصل بحروف الشرط لا ينفع في ذلك حال المقدّم والتالي فإنّه قد يكون من سالبتيْن

موجب كقولك: إن كان ليس ولا واحد من الناس بحيوان فليس ولا واحد من الناس

١٠ بحسّاس، فإنّ هذا موجب لإثبات اللزوم فيه بين قضيّتيْن؛ وقولك: ليس إن كانت الشمس

طالعة فالنهار موجود، فهذا سالب وإن كانت القضيتان موجبتيْن وعلى هذا القياس؛ أ٣٧ظ |

وكذلك في المنفصل. وهذه جملة إليك تفصيلها لا يطول به الكتاب.

٢ أن يكون (الأوّل): — [أ]. ٢ أيّ: أية [ب]. ٣ حمليّن: حملي [ب، ج]. ٣ وشرطيّ: وشرطي [ب، ج].
٣ متّصلًا ومنفصلًا: متّصل ومنفصل [ب، ج]. ٣ تاليًا: تال [ب، ج]: تاليا في [أ]. ٣ مقدّمًا: مقدّم [ب، ج].
٤ متّصلًا: متّصل [ب، ج]. ٤ منفصلًا: منفصل [ب، ج]. ٥ فيجوز: يجوز [ب، ج]. ٥ وسالبيْن: أو سالبين
[أ]. ٥ موجبًا وسالبًا: موجب وسالب [ب، ج]. ٦ متغيّر: متعين، في الهامش [أ].

[5. The parts of disjunctive and conditional propositions]

The disjunctive may have two parts, like when we say: "Either this number is even or this number is odd." It may [also] have several finite parts, like when you say: "Either this number is a pair of even,[47] or a pair of odd,[48] or a pair of even and odd,[49] or an odd prime,[50] or an odd composite;"[51] the parts of the disjunctive [proposition] are potentially infinite, but that disjunctive never comes into actuality.

You should know that the conditional [proposition] may have several parts in the antecedent, so that its antecedent consists of several propositions; nevertheless, the hypothetical is one, since the consequent only follows when they are gathered together, like when you say: "If this is so and this is so, then this is so." The consequent is not consequent to one of them singularly taken so long as they are not gathered. If the parts of the consequent are more than [just] one proposition, the conditional is not one proposition; rather, it is several conditional [propositions] whose antecedent is one, like when you say: "If the sun rises, then it is day and the animals are awake," each being a consequent in itself and the conditional [propositions] are two, just like in the case of the categorical, whenever the subject or the predicate are expressions that are not one essentially, but by accident.

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[47] E. g. 8, which results from 4 + 4.
[48] E. g. 6, which results from 3 + 3.
[49] E. g. 7, which results from 3 + 4.
[50] E. g. 3.
[51] E. g. 9, an odd number divisible by 3.

(٥)

والمنفصلة قد تكون ذات جزئيْن كقولنا: إمّا أن يكون هذا العدد زوجًا وإمّا أن يكون هذا العدد فردًا وقد يكون ذات أجزاء كثيرة متناهية كقولك: إمّا أن يكون هذا العدد زوج الزوج أو زوج الفرد أو زوج الزوج والفرد أو فردًا أوّلًا أو فردًا مركّبًا وربّما كانت أجزاء المنفصلة غير متناهية في القوّة لكنّ تلك المنفصلة لا يخرج إلى الفعل البتّة.

واعلم أنّ المتّصلة قد تكون كثيرة أجزاء المقدّم بأن يكون مقدّمها قضايا كثيرة ومع ذلك ٥ تكون الشرطيّة واحدة إذا كان التالي إنّما يلزم عند اجتماعها معًا كقولك: إن كان كذا وكان كذا، كان كذا. فيكون التالي ليس تاليًا لواحد منها وحدة ما لم يجتمع وإذا كانت أجزاء التالي قضايا فوق واحدة لم يكن المتّصلة قضية واحدة بل كانت متّصلات كثيرة مقدّمها واحد كقولك: إن كانت الشمس طالعة فالنهار موجود والحيوانات مستنقظة، ١٠ وكلّ واحد تال بنفسه والمتّصلة اثنتان، كما في الحمليّة إذا كان الموضوع أو المحمول ألفاظًا لا تتّحد بالذات بل بالعرض.

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٢ هذا العدد: — [أ]. ٢ ذات: في الهامش [أ]. ٢ أجزاء: آخرا [أ]. ٣ فردًا أوّلًا أو فردًا مركّبًا: فردًا مركّبا أو فردًا أولا [ب، ج]. ٣ أوّلًا: مفردا، و"أولا" فوق السطر [أ]. ٣ أجزاء: آخرا [أ]. ٥ مقدّمها: واحد منها [أ].