NAZARİYAT

Meḥmed Emīn Üsküdārī's *Sharḥ al-Barāhīn al-khamsa* on Infinity

Analysis and Critical Edition*

M. Necmeddin Beşikci**

Abstract: This article examines the form and content of *Sharḥ al-Barāhīn al-khamsa*, written by Meḥmed Emīn Üsküdārī (d. 1149/1736-37), an important figure of eighteenth-century Ottoman Turkish philosophical thought, on the problems of the finitude of extensions and the invalidity of the idea of infinite regress. The subject of infinity appeals to a broad range of disciplines, being the mainstay of many theological questions such as the demonstrations for the existence of a necessary existent as well as many other epistemological, ontological, and cosmological issues. This question has historically concerned Peripatetic *falāsifa* and *mutakallimūn* from different intellectual traditions and has become part of a cosmopolitan theological and philosophical tradition in which distinct treatises were compiled by scholars of the post-Rāzīan period (*mutaʾakhkhirūn*). One of the last representatives of the late Ottoman period, Meḥmed Emīn Üsküdārī, authored such a treatise on this question. This treatise is important as a window on the infinity question in Ottoman intellectual thought. In addition to the ladder (*al-burhān al-sullamī*) and collimation (*burhān al-musāmata*) demonstrations for the discussions on the infinity of extensions, this treatise also uses the mapping (*burhān al-taṭbīq*), correlation (*burhān al-taḍāyuf*), and throne (*al-burhān al-ʿarshī*) demonstrations as well as two other demonstrations mentioned by the Persian Mīrzā Jān Shīrāzī (d. 995/1587) for the discussions of infinite regress. In this context, Üsküdārī made a short and concise presentation of the aforementioned demonstrations, supporting some of them with geometric diagrams. This article consists of i) an analysis and ii) critical edition as its two main features and examines Üsküdārī's evaluations of each of the demonstrations, their historical background, and their differences and similarities in terms of novelty and continuity.

Keywords: Meḥmed Emīn Üsküdārī, Ottoman Turkish theoretical thought, infinity, al-Dawānī's impact on Ottoman thought

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Introduction

Discussions on the question of infinity largely occupied the agenda of both Ancient-Hellenistic philosophers and the Islamic thinkers who were respectively associated with the Peripatetic and *kalām* traditions. The fact that the concept of infinity has a multi-layered structure necessitated the examination of the discussions at different levels and laid the groundwork for the studies to be of an interdisciplinary character. However, when dealing specifically with Islamic theoretical thought, the ultimate goal in the investigations on infinity have been to solve metaphysical and theological questions. Though the infinity of numbers is considered the subject matter of arithmetic, the infinity of extensions[1] as the subject matter of geometry, and the infinity of objects as the subject matter of physics, the main purpose of dealing with these questions has been their metaphysical and theological implications. This is because, apart from establishing the existence of God (*ithbāt al-Wājib*), the notion of infinity has a central function in many theological, ontological, epistemological, and cosmological discussions. To be more specific, many questions are found related to these fields which are based on the negation of the idea of infinity, such as *dalīl al-imkān* and *dalīl al-ḥudūth* (developed to affirm God's existence); discussions on some attributes of God; some aspects of prophethood; notions such as existence, the causality principle, eternity vs. temporal origination, and necessity vs. contingency (as studied within the scope of *al-umūr al-ʿāmma*); the acquisition of knowledge (one of the most fundamental questions in epistemology); and the theory of *al-jawhar al-fard* [the smallest indivisible part]. The present work aims to introduce the treatise of Meḥmed Emīn Üsküdārī (d. 1149/1736),[2] which was written during the eighteenth

1 Üsküdārī defined the concept of *buʿd* as a genus with three types: width, length, and depth. See Üsküdārī, *Sharḥ al-Barāhīn al-khamsa al-mashūra fī al-ḥikma li-ithbāt tanāhī al-abʿād wa buṭlān al-tasalsul maʿa asʾilatihā wa ajwibatihā*, Hacı Selim Ağa, Kemankeş Abdülkadir 321, 1[b]; Since there cannot be a dimension between two points or two lines, the concept of *tanāhī al-abʿād* refers to the finitude of extensions in width, length and depth. Therefore, throughout the paper, Üsküdārī's use of *buʿd* will be translated as extension, not dimension.

2 Meḥmed Emin b. Meḥmed b. ʿAbdülḥay b. Saçlı Ibrāhīm Üsküdārī, commonly known as Meḥmed Emīn Üsküdārī. Contrary to popular belief, ʿAbdülḥay Efendī was not Üsküdārī's father, but his grandfather, as Üsküdārī stated his father's name to be Meḥmed in many of his works, including the treatise that I intend to edit in the present work. See Üsküdārī, *Sharḥ al-Barāhīn*,1[b]; Üsküdārī, *Ḥāshiyat Sharḥ al-Qasīda al-Nūniyya*, Süleymaniye Kütüphanesi, Atıf Efendi 1257, 1[b]; Üsküdārī, *Majmaʿu al-rasāʾil*, Hacı Selim Ağa, Kemankeş Abdülkadir 556, 1[a]. Mustakimzāde Süleymān Saʿd al-dīn (d. 1202/1787), contemporary of Üsküdārī, also noted in his work *Majallat al-niṣāb* that Üsküdārī was the grandson of ʿAbdülḥay Efendī. See Mustakimzāde Süleymān Saʿd al-dīn, *Majallat al-niṣ*āb fī al-*nisab wa al-kunā wa al-alq*āb, Süleymaniye Kütüphanesi, Hālet Efendi 628, 355[a]. For more on the life of Meḥmed Emīn

century[3] when Ottoman theoretical thought had been revived and some classical philosophical problems re-circulated on the invalidity of infinite regress and finitude of extensions; the work also aims to investigate the treatise's method and content and present a critical edition of it.

I. Information on Üsküdārī's Manuscript and Authorship

The title of the treatise in the textblock (*ẓahriya*) as used in our research analysis is recorded as *Sharḥ al-Barāhīn al-khamsa al-mashhūra fī al-ḥikmah li-ithbāt tanāhī al-abʿād wa buṭlān al-tasalsul maʿa asʾilatihā wa ajwibatihā*; meanwhile, Bursalı Ṭāhir Efendī has recorded it as *Barāhīn-i Ḫamse Şerhi* in his *Osmanlı Müellifleri* [*Ottoman Authors*].[4] This latter title is a Turkish composition that seems to serve simply as a description rather than a name. The title of the treatise on the text block, however, was most probably written by ʿAbdülḳādir Efendī and belongs to Üsküdārī himself. The fact that the handwriting and pen strokes in the endowment statement—indicating that the treatise was endowed to the Vālide-i ʿAtīk Mosque by ʿAbdülḳādir Efendī—are identical to the handwriting and pen strokes used in the title of the treatise, supports the idea that the name in the textblock was written by ʿAbdülḳādir Efendī. Similarly, the fact that Üsküdārī and ʿAbdülḳādir Efendī lived in the same neighbourhood and period, and that Üsküdārī's works were transmitted to ʿAbdülḳādir Efendī collectively after Üsküdārī's death, strengthens the idea that the title written by ʿAbdülḳādir Efendī on the textblock may have been set by the author. Therefore, I find no qualms in considering the full Arabic title as mentioned in the textblock of the present copy to be the title of the treatise.

Although the title states the treatise to be devoted to explaining the five different demonstrations in the literature regarding the question of infinity, Üsküdārī's

Üsküdārī, see Meḥmed Süreyyā, *Sicill-i Osmānī*, Ed. Nuri Akbayar (Istanbul: Tarih Vakfı Yurt Yayınları, 1996), I, 114; Fındıklılı Ismet Efendī, *Takmilat al-Shaqāʾiq fī ḥaqqi ahl al-ḥaqāʾik*, Ed. Abdülkadir Özcan (Istanbul: Çağrı Yayınları, 1989), 105–6; Bursalı Meḥmed Ṭāhir, *Osmanlı Müellifleri*, Ed. Mehmet Ali Yekta Saraç (Ankara: Türkiye Bilimler Akademisi, 2016), I, 449; For a comprehensive listing of Üsküdārī's works, see Ömer Türkmen, "Mehmed Emîn el-Üsküdârî'nin 'Nadratü'l-enzâr fî Şerhi'l-Menâr' Adlı Eserinin Tahkîki" (PhD dissertation, Uludağ University, 2017), 41–7.

3 For an exhaustive assessment regarding the eighteenth century in which Üsküdārī lived, see Ihsan Fazlıoğlu, "Muhasebe Döneminde Nazârî İlimler", *İslam Düşünce Atlası: Muhasebe Dönemi-Arayışlar Dönemi*, Ed. İbrahim Halil Üçer (Konya: Konya Büyükşehir Belediyesi Kültür Yayınları, 2017), 1043–58.

4 Bursalı Meḥmed Ṭāhir, *Osmanlı Müellifleri*, I, 449.

explicit statement in the preface about the work's category being a commentary[5] in addition to how he separated the main text and comments with red lines in the manuscript negate this idea. Despite no other manuscript having been found, this treatise can be considered a commentary on another treatise entitled *al-Barāhīn al-khamsa al-mashhūra fī al-ḥikmah li-ithbāt tanāhī al-abʿād wa buṭlān al-tasalsul maʿa asʾilatihā wa ajwibatihā*, perhaps also authored by Üsküdārī.

The author of the present treatise is Meḥmed Emīn b. Meḥmed b. ʿAbdülḥay b. Saçlı Ibrāhīm Üsküdārī. Üsküdārī's gloss on *al-Risālā fī ithbāt al-wājib al-qadīma* and *Ḥāshiyat Mīrzā Jān ʿalā al-Risālā fī ithbāt al-wājib al-qadīma*, and the recognition of the ideational influence of the treatises mentioned above by al-Dawānī and Mīrzā Jān quite clearly confirm the idea that the present treatises belongs to Üsküdārī. Likewise, comparing the script in this manuscript with others written by Üsküdārī strengthens the idea that the present manuscript belongs to Üsküdārī.[6] In addition, the clear citation of the various stages of the transfer of the manuscript from Üsküdārī to the Vālide-i ʿAtīḳ Mosque in the biographical sources also supports this idea.[7] Alongside this, Ṭāhir Efendī's emphasis of not only the attribution of the manuscript to Üsküdārī but also the attribution of treatise to him by saying, "The manuscript written in his hand is kept in the aforementioned library"[8] while referencing the present treatises strengthens my proposed demonstration. Likewise, the marginal notes in the manuscript and the use of the term *min hu* [from him] at the end of the notes are penned with handwriting identical to that in the main text. This also suggests that the notes may have been written by Üsküdārī. Therefore, a strong case is found in concluding the authorship of the treatise and its marginal notes, as well as the writing style of the manuscript to both, be attributable to Üsküdārī.

The edition will be based on the only copy written by Üsküdārī's hand, which is currently hosted in the Hacı Selim Ağa Library, Kemankeş Abdülkadir Emir Hoca Collection under catalogue number #321. To the best of my knowledge, no

5 Üsküdārī, *Sharḥ al-Barāhīn al-khamsa*, 1[b].

6 See Üsküdārī, *Majmaʿ al-rasāʾil*, 1[a].

7 Bursalı Meḥmed Ṭāhir, *Osmanlı Müellifleri*, I, 449; Fındıklılı Ismet Efendī, *Takmilat al-Shaqāʾiq*, 106.

8 Üsküdārī's works should be noted as having been transmitted to ʿAbdülḳādir Efendī (also known as Emir Hoca Kemankeş) (d. 1152/1738-1739) collectively after Üsküdārī's death. After the death of ʿAbdülḳādir Efendī, the works in question were endowed to the Vālide-i ʿAtīḳ Mosque. Bibliographic sources contend that these works were later transmitted to the library established by the Ministry of Foundations on the *qibla* side of the Vālide-i ʿAtīḳ Mosque. See Bursalı Meḥmed Ṭāhir, *Osmanlı Müellifleri*, I, 449; Fındıklılı Ismet Efendī, *Takmilat al-Shaqāʾiq*, 106.

other copy of the referenced treatise has survived to our times. The present copy consists of 9 leaves with varying numbers of lines. The copy's narrative in question was explicated through diagrammatic representations and subjected to further comments with notes in the margins. The textblock of the manuscript contains the title, endowment seal, and endowment statement, indicating that the copy had been endowed to the Vālide-i ʿAtīḳ Mosque as written by ʿAbdülḳādir Efendī. The work has no colophon, date of copy, or copyist name.

II. Content and Analysis of the Treatise

1. Intellectual and Historical Background

With the impact of Peripatetic philosophy on the *mutaʾakhkhir* period of the Islamic intellectual tradition, the discussions on infinity that surround the concept of infinite regress began to be examined independently. Moreover, many distinct treatises related to infinity were penned in the same period. The relevant literature was enriched further by providing the proofs employed on infinite regress and the finitude of extensions (*tanāhī al-abʿād*). Being an important figure of eighteenth-century Ottoman thought, Üsküdārī was also one of the scholars who had authored an independent treatise on this problem. However, Üsküdārī complained that previous works on infinite regress and the finitude of extensions (*abʿād*) were either too long - which students found wearisome - or too short such that the subject was incomplete.[9] So then, he decided to formulate a short and useful treatise in order to facilitate students' study of this problem.[10] However, before making a detailed evaluation regarding Üsküdārī's treatise, I consider it appropriate to review some important points in relation to the question of infinity.

Ibn Sīnā noted the first thing to discuss in relation to infinity to be its conceptual analysis. He held infinity as something to be spoken of either literally or metaphorically. Metaphorical infinity cannot actually be considered infinite in the real sense but is exclusively employed to refer to an allusion to multiplicity, and thus does not lead to a philosophical problem. Literal infinity, conversely, can be

9 On the other hand, as will be pointed out, Üsküdārī appreciated al-Dawānī's treatise on infinite regress and noted that his *Sharḥ al-Barāhīn* to be edited in the present paper was based on al-Dawānī's *al-Risālā fī ithbāt al-wājib al-qadīma*. Similarly, Üsküdārī spoke highly of al-Dawānī's work on infinite regress in his gloss on *Sharḥ al-Qasīda al-Nūniyya*, in which he quotes much from al-Dawānī's work. See Üsküdārī, *Ḥāshiyat Sharḥ al-Qasīda al-Nūniyya*, 12ᵃ–14ᵃ.

10 Üsküdārī, *Sharḥ al-Barāhīn*, 1ᵇ.

spoken of in two ways: by way of absolute negation (*ʿalā jihat al-salb al-muṭlaq*) or not by way of absolute negation (*lā ʿalā jihat al-salb al-muṭlaq*). The former means that the finite is negated from the thing to be infinite by way of absolute negation by its nature, whereas the latter implies that there may be finitude in the nature of the thing but this finitude is negated from it. According to Ibn Sīnā, infinity in the sense of "absolute negation" does not cause a logical problem in the same way as metaphorical infinity. Therefore, "an actual infinity that is not by way of absolute negation" is the type of invalidity sought in the infinity debates.[11]

Another issue that presents itself in the discussions of infinity is the range of principles employed in the demonstrative proofs for disproving actual infinities. The inequality between the part and whole, the necessity of the things that *actually* exist to be finite, and the impossibility of contradiction are some axioms that have been employed in infinity discussions since ancient philosophical times.[12] The use of the above-mentioned principles as well as similar other ones that serve the same function in these demonstrations should be evaluated among the epistemological projections of the debates on infinity as the demonstrative proofs do not lead to the desired conclusion unless they are based on similar agreed-upon principles.

Üsküdārī's treatise investigates two basic questions: (i) the finitude of extensions (*buʿd*), and (ii) the impossibility of infinite regress. The question of finitude of extensions in Islamic intellectual thought has been examined in the disciplines of *kalām* and philosophy, particularly in the *ṭabīʿiyyāt* sections investigating natural philosophy.[13] Despite different proofs existing on the finitude of extensions in the literature, the referenced treatise in the present work exclusively focuses on the ladder (*al-burhān al-sullamī*) and collimation (*burhān al-musāmata*) demonstrations.[14] However, before turning to Üsküdārī's assessments

11 Ibn Sīnā, *The Healing: The Physics* [*al-Shifā: al-Tabīʿiyyāt*], Ed. and Trans. J. McGinnis, (Provo: Brigham Young University Press, 2009), II, 321. I mainly follow McGinnis's translation in explaining Ibn Sīnā's statements in this regard.

12 These principles were also employed in discussions of infinite regress, apart from discussions about finitude of extensions. For some examples of the use of these principles in ancient times, see Aristotle, *Gökyüzü Üzerine* [*De Caelo*], Trans. Saffet Babür (Ankara: Dost Kitabevi, 1997), 33; Ömer Türker, *İslam'da Metafizik Düşünce: Kindî ve Fârâbî* (Istanbul: Klasik, 2019), 131.

13 Üsküdārī's explanations in this context are almost the same as al-Ṭūṣī's explanations in *Ṣharḥ al-Isharat wa al-tanbīhāt*. See Naṣīr al-dīn al-Ṭūṣī, *Sharḥ al-Ishārāt wa al-tanbīhāt* (with Ibn Sīnā, *al-Ishārāt wa al-tanbīhāt*), ed. Suleyman Dunyā (Cario: Dār al-Maʿārif, 1960), II, 183–4; compare with Üsküdārī, *Sharḥ al-Barāhīn*, 1b.

14 For other demonstrations, see Izmirli Ismāʿīl Ḥaḳḳi, *Risāla al-tasalsul*, Ed. Osman Demir (Istanbul: Çizgi Yayınları, 2021), 39–55.

of the above-mentioned proofs, I would like to reiterate that the discussions on the finitude of extensions in Islamic thought had mainly been carried out along the axis of the finitude of corporals, with the concept of void not being taken into account in these discussions.[15] Therefore, Üsküdārī's discussions on the finitude of extensions in particular and the proofs developed in the literatures of *kalām* and philosophy in general focus on corporeality (i.e. physical infinity) and do not discuss the notion of void.

The second prominent subject dealt with in Üsküdārī's treatise is the proposed demonstrations that seek to refute the concept of infinite regress (i.e., continuation of objects and events in a series of causation going infinitely back).[16] The subject of negating infinite regress has wide theological and philosophical implications, such as the existence of a necessary existent and the temporal origination of the cosmos. Üsküdārī, in his dedicated section of his treatise, deals with the invalidity of infinite regress in two subsections: (i) the well-known demonstrations: mapping [*burhān al-taṭbīq*], correlation [*burhān al-taḍāyuf*], and throne [*burhān al-ʿarshī*] demonstrations and (ii) other lesser-known demonstrations.

In order to see the tension between the *mutakallimūn*[17] and Peripatetic *falāsifa*[18] regarding disproving infinite regress, it is essential to define the context of the discussion and avoid generalizations. In this respect, Üsküdārī's contemporary Ismāʿīl Gelenbevī's (d. 1205/1791) emphasis on the infinite regress being spoken of in two ways by the *falāsifa* (i.e., actual and potential infinities) is important. Added to this, Gelenbevī noted no conflict to exist between the parties regarding the possibility of potential infinite regress. Then Gelenbevī claimed the *falāsifa* to have divided the actual infinite regress into six: (i) infinite elements from the direction of causes, (ii) infinite elements from the direction of effects, (iii) infinite elements from the direction of causes and effects, (iv) infinite whole elements

15 Al-Lāhījī, *Shawāriq al-ilhām fī Sharḥ Tajrīd al-kalām*, Ed. Ekber Esed Alizāde (Qum: Muʾassasat al-Imām al-Ṣādiq, 1430), III, 367; al-Jurjani held that the related demonstration is applicable in immaterial extensions as well as in the finitude of corporals (i.e., physical objects). However, its applicability in immaterial extensions depends on the existence of the void, due to its existence being rejected by other scholars. See Seyyid Sharīf al-Jurjānī, *Sharḥ al-Mawāqif*, Trans. Ömer Türker, (Istanbul: Türkiye Yazma Eserler Kurumu Başkanlığı, 2021) II, 1183.

16 Osman Demir, "Teselsül", *DİA*, XL, 536–8.

17 The usage of the term *mutakallimūn* here refers primarily to the Māturīdī and Ashʿarī theological schools.

18 While the *kalām* works often attribute this position to the *falāsifa* (i.e., Peripatetic philosophers), the intent is mostly Ibn Sīnā.

with no causal relation to each other but positional order, (v) infinite non-ordered elements whether positionally or naturally, and (vi) infinite successive elements. After presenting this division, Gelenbevî noted a consensus to exist between the *mutakallimūn* and *falāsifa* on the impossibility of the first four types of actual infinite regress. Therefore, the dispute between the parties is about an actual infinity of non-ordered and non-whole elements.[19] As such, one can conclude that the demonstrations Üsküdārī cited regarding the invalidity of infinite regress, in particular, and the discussions in Islamic theoretical thought, in general, to have aimed to demonstrate the finitude of non-ordered and non-whole elements.

2. Content Analysis of the Treatise

Üsküdārī's treatise on infinite regress and finitude of extensions consists of a preface and two main parts:

Preface: This begins with a *ḥamdala*[20], *ṣalwala*[21], some preliminary information on the subject, and a note stating the treatise to have been written for the convenience of students.

First Section: This presents a description of the ladder and collimation demonstrations that had been produced to disprove the finitude of extensions, a visualization of the above-mentioned proofs through diagrammatic representations, and a brief discussion of the issue.

Second Section: This reports on the well-known and lesser-known proofs regarding the invalidity of infinite regress and includes a laconic discussion of any directed objections.

2.1. Demonstrations on the Finitude of the Extensions (Tanāhī al-abʿād)

a. Ladder Demonstration (*Al-burhān al-Sullamī*)

One of the most fundamental demonstrations employed for the finitude of extensions in Islamic intellectual thought is the ladder demonstration. This demonstration which can be found in Ibn Sīnā's works in its conventional form

19 Ismāʿīl Gelenbevī, *Ḥāşiyat Gelenbevī ʿalā Sharḥ al-Jalāl al-Dawānī ʿalā al-ʿAqāʾid al-ʿAḍuḍiyya*, (Beirut: Dār al-Kutub al-ʿilmiyya, 2017), I, 197–8.

20 An abbreviated version of the formula 'al-ḥamdu lillāh'

21 An abbreviated version of the salutations on the Prophet 'ṣalla Allāh ʿalayhi wa sallama'

and which was widely utilized in the *kalām* literature of the *mutaʾakhkhir* period;[22] was employed in a more primitive form in Aristotle's *De Caelo* [*On the Heavens*].[23] This demonstration that Ibn Sīnā had reconstructed with some objections was criticized by some post-Avicennan thinkers such as Abū al-Barakāt al-Baghdādī (d. 547/1152). Its place in the debates on the invalidity of the finitude of extensions was also questioned. However, many scholars such as al-Bahmanyār b. Merzubān (d. 458/1066), Fahkr al-dīn al-Rāzī (d. 606/1210), Naṣīr al-dīn al-Ṭūṣī (d. 672/1274), Saʿd al-dīn al-Taftazānī (d. 792/1390), Sayyid Sharīf al-Jurjānī (d. 816/1413), Mullā Ṣadrā (d. 1050/1641), and Üsküdārī himself defended the ladder demonstration and attempted to respond to hypothetical objections.[24]

Due to Üsküdārī being an important compiler of the scholastic tradition up to his own period, his views and evaluations on the subject are important. According to Üsküdārī, the basic formulation of the ladder demonstration runs as follows: All extensions are finite; otherwise, two lines could come equally from a single center point and extend to infinity, as is the case with two sides of an equilateral triangle. When considering the equality of the length of the lines and the extensions between the two lines, which Ibn Sīnā called a chord,[25] then an equivalence between the infinity of the lines and the infinity of the chord would also appear. However, this would require infinity to be limited between the two confining sides (*ḥāṣirayn*), and this is a contradiction (see Figure 1).[26]

22 Ibn Sīnā, *al-Ishārāt wa al-tanbīhāt* (with Naṣīr al-dīn al-Ṭūṣī, *Sharḥ al-Ishārāt wa al-tanbīhāt*), Ed. Suleyman Dunyā (Cario: Dāru'l-Maʿārif, [n.d.]), II, 185–90.

23 Mohammad Saleh Zarepour, "Avicenna on Mathematical Infinity", *Archiv für Geschichte der Philosophie* 102/3 (2020): 392–3; Aristotle, [*De Caelo*], 33.

24 For more discussion of this problem, see Jon McGinnis, "Mind the Gap: The Reception of Avicenna's New Argument Against Actually Infinite Space", *Illuminationist Texts and Textual Studies*, Ed. Ali Gheissari, Ahmed Alwishah, & John Wallbridge (Leiden: Brill, 2017), 274-303. For the formulations of the scholars mentioned, see the following respective sources: al-Bahmanyār b. Merzubān, *al-Taḥṣīl*, ed. Murtaḍā Muṭahharī (Tehran: Dānishgāh Tehran, 1375) 348; Fakhr al-dīn al-Rāzī, *Sharḥ al-Ishārāt wa al-tanbīhāt*, Ed. Ali Rıḍā Najafzāde, (Tehran: Anjumān-i Āthār wa Mafākhir-i Farhangī, 1384/2005) II, 48–9; al-Ṭūṣī, *Sharḥ al-Ishārāt*, II, 184–9; Al-Taftazānī, *Sharḥ al-Maqāsid*, Ed. Abdurrahman Umeyre (Beirut: ʿĀlam al-kutub, 1998) 3, 96; al-Jurjānī, *Sharḥ al-Mawāqif*, II, 1195.

25 Ibn Sīnā, *The Physics*, II, 330. The mention of the 'chord' here, which is not mentioned by Üsküdārī, aims to present a better understanding of the given formulation above.

26 Üsküdārī, *Sharḥ al-Barāhīn*, 1[b]–2[a].

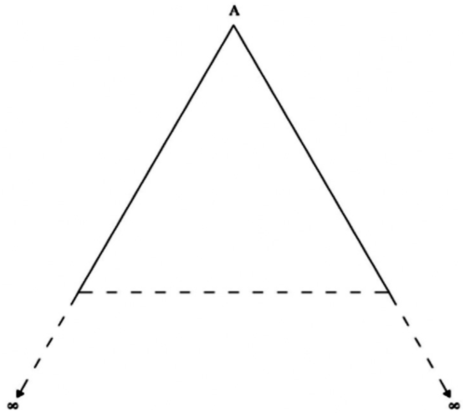


Figure 1. The diagram of the ladder demonstration.

The conventional form of the ladder demonstration mentioned above and found in Ibn Sīnā's oeuvre in a similar form was systematized by Fahkr al-dīn al-Rāzī into four premises by considering Ibn Sīnā's formulation. Studying this demonstration through al-Rāzī's formulation is important in order to clearly catch the premises on which the demonstration is established. According to al-Rāzī, the theoretical application of the demonstration is not possible unless these four premises are established. A brief presentation of these premises goes as follows: i) If the infinity of extensions were not impossible, then the two lines could emerge from a single center, as on the two sides of a triangle, and then spread out uniformly into infinity. ii) Based on this premise, uniformly increasing extensions could occur between the two lines in question, and iii) these extensions could also increase infinitely. iv) In this framework, each above level needs to encompass the length of the level below, with the extent of the increased lengths between the lines in question being proportional to their lengths. Al-Rāzī held that, once these premises are established, it should establish that the amount of infinite extensions *actually* exists in one extension. However, this is invalid as it would require limiting the infinity between two confining sides, which leads to a contradiction.[27]

Considering both Ibn Sīnā's explanation and al-Rāzī's premises, Üsküdārī evidently did not interfere with the form of the ladder demonstration his predecessors had established in the Islamic intellectual tradition. This is because

27 Ibn Sīnā, *al-Ish*ārāt, II, 183–6; Fakhr al-dīn al-Rāzī, *Sharḥ al-Ishārāt*, II, 48–9.

both Üsküdārī and his predecessors had established the relevant demonstration on the same principles and had used very similar conceptual structures. When examining the formulations more closely in this respect, the ladder demonstration having indeed been established on the following two basic principles should become clear: i) the principle of equality of the lateral side lengths in equilateral triangles and the extension between these sides with reference to geometrical theorems and ii) the principle of noncontradiction with reference to classical logic. While the first premise requires the extensions between the two lines that extend to infinity should also be infinite, the second states that infinity cannot be limited,[28] otherwise this would lead to a contradiction regarding the ontology of infinity. This part of the present work aims to deal with the two premises mentioned above within the framework Üsküdārī has drawn.

i) Equivalence of Lateral Sides and the Extension Between the Lateral Sides in Equilateral Triangles

The first thing that should be noted in Üsküdārī's formulation is that, while he had explicated the demonstration with its premises, he did not use the expression "two lines emerge from a single center" in its absolute sense. ʿAbd al-Razzāq al-Lāhījī (d. 1072/1661), an important figure in the compilation of *kalām* literature, argued the equality of the length of the sides of the triangle and the extension between the two sides to be necessary for the applicability of the demonstration.[29] This necessity can only be provided in equilateral triangles as opposed to isosceles or scalene triangles. This seems to be why Üsküdārī addressed the equality between the lengths of the lateral sides and the extension claimed to be infinite in particular.

In this respect, Üsküdārī tacitly introduced a discussion centered on the concept of potential infinity Ibn Sīnā had mentioned in his *al-Shifāʾ*. The stress on potential infinity appears to be an attempt to associate the infinity of extensions with the infinity of numbers. Such an assessment resulted in extensions not ceasing to exist at a certain limit, the same as numbers, and thus, extensions do not reach

28 The principle that what stays between two limits is finite has been used since Aristotle and plays a central role in discussions of infinity. For an example of the use of this principle in Aristotle's works, see Aristotle, [*De Caelo*], 33.

29 Al-Lāhījī, *Shawāriq al-ilhām*, III, 375.

a limit after which no other extension can be considered. Using Üsküdārī's quote with respect to Ibn Sīnā, the extensions between two lines cannot be concluded to be infinite, as the two lines in the ladder demonstration go to infinity; at most, one can deduce that the extensions will increase infinitely. In addition, because finite increases and decreases exist between the extensions formed by the lines mentioned in the ladder demonstration, the actual infinite already cannot exist. This is because that which is larger than a finite by a finite amount must itself be finite. Therefore, it is out of the question that the infinity stays between two limits and that the principle of noncontradiction is damaged.[30]

Üsküdārī held the objection Ibn Sīnā had put forth to be invalid due to the applicability of the ladder demonstration depending on the lengths of the lines actually behaving like lateral sides and the extensions between the endpoints of the two lines being equal. In this framework, the lines in question need to come out from the center at 60° angles, just as in equilateral triangles. For example, an equilateral triangle has lengths of 1 meter for the lateral sides coming from the center; therefore, the extension between the two sides must also be 1 meter; if the lateral sides are 100 meters long, the extension between the two sides will also be 100 meters. As a result, if the lateral sides are infinite, the extension between the two sides (i.e., the two limitations) must also be infinite, and this is a contradiction.[31]

Üsküdārī, in this respect, described the angles of the lines in the ladder demonstration more specifically by depicting diagrammatic representations.[32] According to the author, if one assumes the points dividing a circle into six equal parts and then connects the opposite points from them, the result is three intersecting lines at the center of the disk. Each of these lines represents the diameter of the disk. Thus, the circle has six equal angles in the center and six equal arcs[33] on the periphery of the circle between the circumscribed circle and the line

30 Ibn Sīnā, *The Physics*, II, 330; Üsküdārī, *Sharḥ al-Barāhīn*, 2ª.

31 Üsküdārī, *Sharḥ al-Barāhīn*, 2ª.

32 Geometry theorems were effectively employed in commentary and gloss tradition in Ottoman intellectual thought, as in the works of ʿAlī al-Qūshjī, Muʾayyadzāde, al-Dawānī and Gelenbevī. See Ihsan Fazlıoğlu, "Eukleides Geometrisi ve Kelâm", *Aded ile Mikdâr: İslâm-Türk Felsefe–Bilim Tarihinin Mathemata Mâ-cerâsı* (Istanbul: Ketebe, 2020) 159.

33 Üsküdārī held 6 arcs to exist between the circumscribed circle and the hexagon. However, if we connect each of the 6 points on the circle to the other points as in the diagram, the number of arcs formed will

segments making up the hexagon. Each of these angles is 60°, which is two-thirds of the right angle (90°) as stated above, rather than 4 right angles surrounding the center of the circle (see Figure 3).

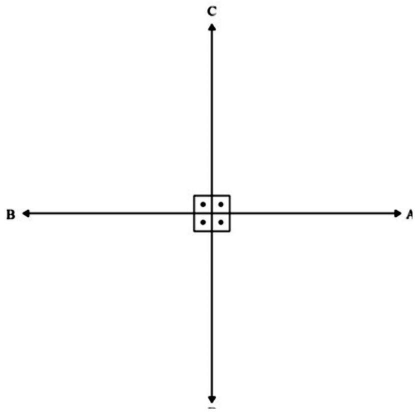


Figure 3. Encircling a point with four right angles.

But here, not two but three lines pass through the centre; accordingly, the disk is not divided into 4, but into 6 equal parts; and therefore, the angles at the centre of the disk are 60°, not 90°. Each 60° angle at the center of the circle is surrounded by two sides. Since each side lies between the center and the circumference of the circle, it represents the radius. Here, the two lines mentioned in the ladder demonstration are like the two equal sides of an equilateral triangle with angles of 60° (see Figure 4).[34]

be 12, not 6, which are the short arcs that make up the hexagon; and the other 6 are long arcs formed by connecting opposing points. See Figure 2:

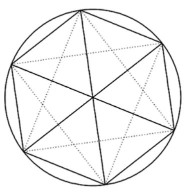


Figure 2. Dotted line segments indicate the arcs Üsküdārī did not point out.

34 Üsküdārī, *Sharḥ al-Barāhīn*, 2ᵃ–2ᵇ.

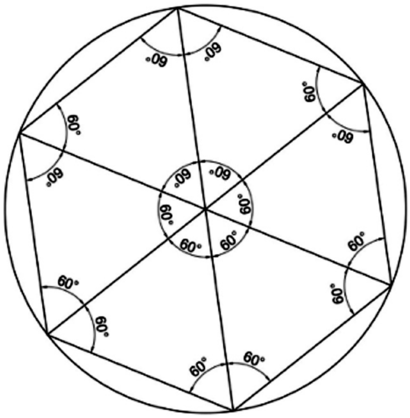


Figure 4. The lines in the formulation of the ladder demonstration are 60° apart at the center.[35]

As a result of Üsküdārī's evaluations, the representative diagram of the ladder demonstration should be as that shown in Figure 5.

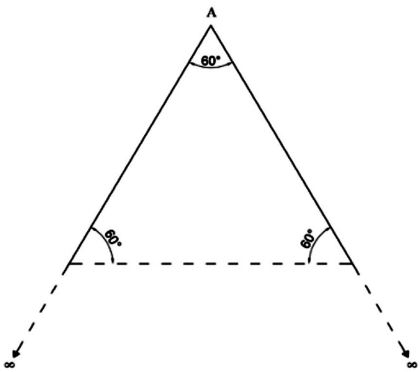


Figure 5. The representative diagram of the ladder demonstration.

These evaluations that are based on the geometry theorems overlap with the formulations of the armoured demonstration (*burhān al-ṭursī*), which is described as a variation of the ladder demonstration.[36] With these explanations and geometric representations, Üsküdārī more exactly expressed the equality between the length of the sides and the extension between the two lengths, which is one of the main

35 See Üsküdārī, *Sharḥ al-Barāhīn*, 2[a].

36 For Izmirli Ismāʿīl Ḥaķķi's assessments on this issue, see Izmirli Ismāʿīl Ḥaķķi, *Risāla al-tasalsul*, 53–4; For the differences between the ladder and armoured demonstrations, see McGinnis, "Mind the Gap", 298.

premises of the ladder demonstration. In this way, he attempted to answer the aforementioned objection put forward by Ibn Sīnā.

ii) Noncontradiction Principle

The second important point in the formulation of the ladder demonstration is Üsküdārī's assessments regarding the concept of infinity. The subtext of these assessments appears to be based on the principle of noncontradiction in classical logic. In fact, this principle has been effectively employed in the discussions about infinity in general and in the demonstrations developed for the finitude of extensions in particular within Islamic intellectual thought.

As Üsküdārī had revealed through his reading of Ibn Sīnā, an equality exists between the extensions formed by the two lines emerging from the center at 60° angles with the lengths of these lines; if the lines go on to infinity, the space between their endpoints would also have to be *actually* infinite. However, the infinity of the extension that exists between the two lines creates a categorical problem in terms of the ontology of infinity due to the extension mentioned above representing the extension that exists in between two points on two lines that start from the center 60° apart and extend into infinity. If one connects this region located opposite the center (vertex) with a third line, then this line will necessarily end at points on the other two lines. In other words, the infinite extension will be limited between two line segments starting from the center in the form of triangular sides, with a third line segment connecting the two endpoints equidistant from the center. Due to the limitation being a phenomenon that requires finitude, the limitation of the extension that is claimed to be infinite is required to be finite, which is a contradiction.[37]

This formulation Üsküdārī put forth by referring to the properties of the equilateral triangle has been subjected to further interpretations alongside ʿAlī al-Qūshjī's (d. 879/1474) objections to the ladder demonstration. ʿAlī al-Qūshjī was an important member of the Samarqand observatory and mathematical school, and according to him, the impossibility of the ladder demonstration is not due to the infinity of the lines starting from the center but from connecting the supposed endpoints of these two lines equidistant from the center, because connecting the endpoints of these two lines necessarily requires the finitude of the extension. This

37 Üsküdārī, *Sharḥ al-Barāhīn*, 2^{b}.

is because the line segment connecting the points in question terminates at the two endpoints mentioned above. He held that, because this formulation is impossible in itself, the requirement of other impossibilities would be perfectly ordinary.[38]

Now that the context of this Avicennan objection has been clarified, we can move on to Üsküdārī's response to the relevant objection. According to Üsküdārī, no paradox exists in the ladder demonstration as ʿAlī al-Qūshjī claims since the impossibility of the ladder demonstration is not resulting from connecting the endpoints of the two lines; on the contrary, it is due to the fact that the extension claimed to be infinite remains between two limiting sides, with reference to the necessity that the length of the sides and the extension that exists between the sides must be equal. Therefore, as they are limits, the existence of the two infinite lines in the aforementioned formulation would necessitate the non-existence of infinity, and the thing whose existence necessitates its own non-existence is absolutely impossible.[39] These evaluations Üsküdārī made within the framework of the above objection are remarkable in terms of the ontology of infinity because his opinion was that limitation and infinity are two contradictory concepts that, by their very nature, can never come together.

After touching upon this contradiction, Üsküdārī proceeds to the differences between actual and potential infinities. Ibn Sīnā's objection in this regard, as has been pointed out, indicates the infinity of numbers and the infinity of extensions to be able to be considered as having the same nature. On the other hand, Üsküdārī rejected this similarity because, while the infinity of numbers is potential, the idea of infinity that lies behind the formulation mentioned above is *actual*, as al-Rāzī had pointed out. Üsküdārī drew attention to the extension formed by two lines starting from a center with an angle of 60° should increase equally and uniformly at every level. He then pointed out that each of the extensions that exist will include the extension below it, on its own level, with the extension of the increases in between the lines in question being in proportion to their lengths. Therefore, based on the assumption that the lines extend infinitely, the conclusion that these increases *actually* exist at a single level becomes inevitable.[40]

Üsküdārī emphasized the need to demonstrate the following three premises in order to better comprehend the claims about the *actual* infinity of extensions at a single level:

38 Üsküdārī, *Sharḥ al-Barāhīn*, 2[b]; For ʿAlī al-Qūshjī's tacit objection, see al-Lāhījī, *Shawāriq al-ilhām*, III, 377.

39 Üsküdārī, *Sharḥ al-Barāhīn*, 2[b].

40 *Ibid.*, 3[a].

First premise: The possibility exists for two lines to emerge from a center 60° apart in the form of the sides of a triangle and extend to infinity. If the lines extend infinitely, the extension that exists between the two sides (i.e., lines) will also be infinite. For example, as will be demonstrated in figure 6, assume two lines extend from a central point A to infinity; the assumption can be made that two points on these two lines are equidistant from point A and called points B and C. If we connect points B and C, the line segment BC will be equal to the line segments AB and AC; accordingly, we end up with an equilateral triangle ABC. If we assume two new points D and H have the same distance from points B and C as B and C have from the center A (i.e., D on the line containing B and H on the line containing C), the distance of D from B and H from C will be the same as the distance of points B and C from the center A. Likewise, each line segment AD and AH will be twice as long as the line segments AB and AC. If we connect the points D and H with the line segment DH, an equilateral triangle ADH with all sides equal to each other will occur. If we assume two new points V and Z equidistant from points D and H, with this distance being the same as between D and B and between H and C (uniform increment), and connect points V and Z, the equilateral triangle AVZ will occur. Accordingly, if we assume the points X and T, Y and K, L and M, and then N and S, respectively all further out from A at uniform increments and connect them in the same way, the increasingly longer line segments XT, YK, LM, NS will occur, and this phenomenon can go on to infinity. In this diagram, line segment BC is called the initial extension; line segment DH is called the first extension; line segment VZ is called the second extension; line segment XT is called the third extension; and this arrangement goes on in this way (see Figure 6).

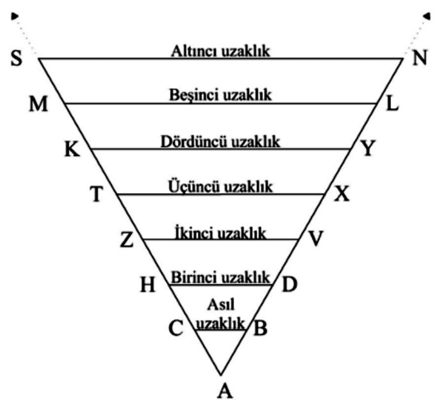


Figure 6. Extensions of uniform increment going to infinity in the ladder demonstration.

Second premise: Each of the line segments between the two sides includes the line segment below it, with a uniform increment between each lines. For example, as in figure 6, the line segment DH is the first extension and includes the line segment BC (i.e., the initial extension); and additionally, the increment of distance that exists in proportion to the lengths of the sides. Likewise, the line segment VZ (i.e., the second extension) contains the line segment DH, which is the first extension; the distances between V and D and between Z and H are the same as between D and B and between H and C (i.e., uniform increment that exists in proportion to the lengths of the sides). This arrangement goes on to infinity. Each of the supposed extensions above the initial extension contain the extensions below it, each level having a uniform increment of distance equal to the preceding level. Therefore, infinite increases must occur in proportion to an infinite number of extensions above the initial extension.

Third premise: The previous premise stated an infinite number of increments must exist between lines in proportion to an infinite number of extensions. In this case, the last extension that exists between two infinite lines will *actually* include the infinite number of increments at its own level. This indicates the existence of a single extension that includes infinite increments located above all other extensions. For example, the increments that occur at the first and second levels are also found within the third extension as it includes the first and second extensions. This arrangement continues infinitely, and thus the possibility of the actual infinite number of increments existing at a single level is demonstrated.[41]

The framework that Üsküdārī intended to describe with the three premises given so far is as follows: If two lines starting from a single center extend to infinity, the extensions between the lines will also increase uniformly to infinity: This necessitates the existence of an *actual* infinite number of increments at a single level, as the resulting extensions increase vertically at each level. As a result, if the lines extend to infinity, these increases must *actually* exist at one level. In other words, the extension that includes infinite increases must also be itself *actually* infinite, which paradoxically leads to the situation that an infinite extension can exist between two limits.[42]

Before moving on to Üsküdārī's assessments of the issue, noting that the formulation of the demonstration has some problems would be appropriate: In

41 *Ibid.*, 3^a-3^b.

42 *Ibid*, 4^a.

particular, claiming that infinite increases *actually* exist in the last level of the infinite extensions leads to a contradictory conceptual structure in itself, as the concept of infinity here refers to things that have no termination. However, the existence of *actual* infinity in the formulation of the ladder demonstration is based on the idea that the infinite number of incremental increases occurs at the final level. More clearly, the claim that infinite incremental increases are at the final level depends on the discontinuation of the two lines exiting from the center point, because unless the two lines in question come to an end, the existence of a level that is to be called the "final level" is impossible. As pointed out by Fakhr al-dīn al-Rāzī, this attempt would give rise to the fallacy of *petitio principii* (*muṣādara ʿalā al-maṭlūb*), indicating the employment of the desired conclusion as a premise of the demonstration. In other words, this position shows a perception of finitude to be found behind the idea of infinity.[43]

Üsküdārī then dealt with some objections related to the idea that actual infinity can exist at a single level. The relevant objection stresses that the judgement regarding the individual incremental increases may not be the same as the judgment given regarding all infinite increases collectively. In other words, no necessity occurs between the predictability of each individual incremental increase at different extensions, nor for the possibility of infinite increases to be predicated at a single extension. Üsküdārī here clarified the subject, giving two examples: While a loaf of bread can feed each person individually, it does not feed all people; in the same way as one person can fit in a house individually, not all people can at the same time. In response to this objection, Üsküdārī returned back to the issue of equality between lateral sides and the extension that exists between the sides due to the infinite increases that exist at a single level are as large as the increases that extend at each level. Therefore, if the lines in the formulation of the ladder demonstration extend infinitely, the extension between the two lines will necessarily have to be infinite.[44]

Another issue that Üsküdārī dealt with regarding the three premises mentioned above is the claim that infinity can be delimited between two limits. In this respect, Üsküdārī analyzed the claim put forward with reference to Euclid's

43 Al-Rāzī, *Sharḥ al-Ishārāt*, 50.

44 Üsküdārī, *Sharḥ al-Barāhīn*, 4[a].

theorems[45] through the concept of potential infinity.[46] According to Üsküdārī's opponents, limiting the infinity between two limits might be possible, as the angle that forms between a circle and the line tangent to the circle is the most acute angle (*aḥadd al-zawāyā*).[47] A straight line drawn through the circle at any point tangentially descends from the point of tangency to the diameter of the circle at a right angle. Thus, the radius intersecting a tangent must necessarily be a right angle, and Euclid's theorem states the right angle to contain an infinite number of the most acute angles. This is because the angles formed by two straight lines can be bisected an infinite number of times. Therefore, if the amount of the most acute angle within the right angle formed between the tangent and the diameter is not infinitely small, then the angle mentioned above can be divided into two again, which shows that the angle in question is not the most acute angle. As a result, in order for the angle formed by the circle and the tangent line to the circle to be the most acute angle, it must be indivisible and also must be infinitely small within the right angle, which means infinity is limited between the diameter and the tangent (i.e., between two limits; see Figure 7).[48]

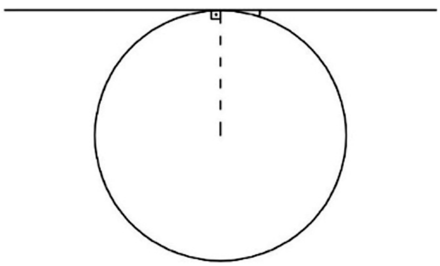


Figure 7. Right angle and the most acute angle.

45 Euclid, III, 15.

46 For some examples of the use of Euclidean theorems in kalām works, see Fazlıoğlu, "Eukleides Geometrisi ve Kelâm", 141–63.

47 Jon McGinnis calls the angle formed between a circle and a line tangent to it the "horn angle." See Ibn Sīnā, *The Physics*, II, 427. The circle and the line tangent to the circle forming the most acute angle should be noted to be impossible in modern geometry as the angle can only be formed when two straight line segments intersect. However, neither does a circle have two points (i.e., minimum linearity) that could be considered line segments. Therefore, modern geometry has no angle formed between the circle and the straight line tangent to the circle. However, classical geometry - as can be seen in Üsküdārī's formulation - allows for the circle to form an angle with the straight tangent line.

48 Üsküdārī, *Sharḥ al-Barāhīn*, 4[a]; compare with See Ibn Sīnā, *The Physics*, II, 307.

As pointed out, Üsküdārī responded to this objection with the idea of potential infinity, as drawing an infinite number of tangent lines to a circle being possible, no such situation has *actually* occurred yet. Therefore, only potentially possible for a right angle containing an infinite number of the most acute angles is only a potential possibility, and potential infinity does not lead to a contradiction.[49] Apart from this, Üsküdārī had two different demonstrations regarding the above-mentioned problem. While the first of these states angles to be divisible because they are either from the category of quantity or quality that is added (*ʿāriḍ*) to quantity; whereas the second rejects the idea that the relevant angle can be the "most acute angle."[50]

b. Collimation Demonstration

Another demonstration employed for the finitude of extensions in Islamic intellectual thought is the collimation demonstration. The fact that the collimation demonstration is first seen in Aristotle's *De Caelo*, and then in a similar form in Ibn Sīnā's oeuvre, clearly reveals the similarity between the historical development between the collimation and the ladder demonstrations.[51] Apart from proving the finitude of extension,[52] the collimation demonstration was employed by Ibn Sīnā for demonstrating the impossibility of circular motion in an infinite void.[53] This was later criticized by Abū al-Barakāt al-Baghdādī, Naṣīr al-dīn al-Ṭūṣī, and Ibn al-Muṭahhar al-Ḥillī (d. 726/1325), then defended by scholars such as al-Rāzī, al-Jurjānī, and Mullā Ṣadrā, and consequently used as an independent demonstration on the finitude of extensions.[54] In this respect, Üsküdārī also dealt with the collimation demonstration independently in the *Sharḥ al-Barāhīn* and presented some objections to it that were mentioned in the literature, together with their solutions.

49 *Ibid*., 4ª-4ᵇ; Ibn Sīnā also held that angles can only potentially bisect into infinity. See Ibn Sīnā, *The Physics*, II, 307.

50 See Üsküdārī, *Sharḥ al-Barāhīn*, 4ᵇ.

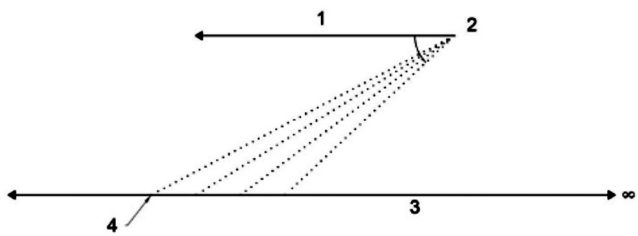
51 For Aristotle's formulation see, Aristotle, [*De Caelo*], 33-5; For Ibn Sīnā's formulation see, Ibn Sīnā, *ʿUyūn al-ḥikma*, Ed. ʿAbd al-Raḥmān al-Badawī (Kuwait: Wakālat al-Matbūʿāt, 1980) 19–20; see also, Zarepour, "Avicenna on Mathematical Infinity", 388–9.

52 Zarepour, *Avicenna's Philosophy of Mathematics*, (Cambridge: University of Cambridge, 2019), 89.

53 See McGinnis, "Avoiding the Void: Avicenna on the Impossibility of Circular Motion in a Void", *Classical Arabic Philosophy: Sources and Reception*, Ed. Peter Ademson (London: Warburg Institute, 2007) 74–89.

54 For more information on this, see Sajjad Hejri, "The argument of 'Collimation' for the Finitude of Dimensions and its Critiques", *Journal of Existence and Knowledge* 1/2 (2015): 99–128.

Üsküdārī put forth the formulation of the collimation demonstration based on al-Jurjānī's *Sharḥ al-Mawāqif*, with some minor modifications. This formulation in general terms goes as follows: All extensions are finite, since two parallel lines (i.e., one finite and the other infinite) are assumed to not intersect at any point, even if the finite line is extended to infinity, because the distance between the two lines remains equal. However, if the finite line is fixed at its starting point and rotated from the other end towards the infinite line by extending,[55] then these lines will have to intersect. Üsküdārī established his statements here by referencing geometrical theorems and the concept of *al-badāha* [self-evidence]. The intersection (*al-musāmata*) that occurs on the infinite line does so at a single point, since, whether infinite or not, the intersection between two lines can only be at a single point. The intersection point, thus, is temporarily originated (*ḥādith*) because it occurs later, as evidenced by the fact that, as pointed out, no such intersection point occurs with parallel lines. Therefore, the intersection that occurs later must have an initial point. In this case, the intersection point formed on the infinite line with the rotating of the finite line must be the first of the intersection points. However, this is impossible because for every point on the infinite line that is considered to be the first point of intersection, an infinite number of other points intersect the infinite line first. Consequently, that is invalid (see Figure 8).[56]



Finite line parallel to infinite line — The finite line intersecting the infinite line
Infinite line — The intersection (*al-musāmata*) point

Figure 8. The formulation of the collimation demonstration.[57]

55 This restriction in the given formulation is specified by Üsküdārī's use of the phrase "لوأُخرج على الاستقامة" and al-Ījī and al-Jurjānī's use of the phrase "بالإخراج". See Üsküdārī, *Sharḥ al-Barāhīn*, 4^b; al-Jurjānī, *Sharḥ al-Mawāqif*, II, 1183.

56 I have set out to explain unclear statements of the given formulation in the based treatise without being faithful to Üsküdārī's text. See Üsküdārī, *Sharḥ al-Barāhīn*, 4^b; compare with al-Jurjānī, *Sharḥ al-Mawāqif*, II, 1183; Zarepour held that Ibn Sīnā's formulation of the collimation demonstration to be unconvincing as it conflicts with some of Ibn Sina's own views as well as with modern mathematical findings. See Zarepour, "Avicenna on Mathematical Infinity", 390.

57 See Üsküdārī, *Sharḥ al-Barāhīn*, 4^b.

The formulation Üsküdārī had given so far was almost the same as the formulation in the works of Ibn Sīnā. However, after outlining the aforementioned formulation, Üsküdārī considered the expression "…because for every point on the infinite line that is considered to be the first point of intersection, an infinite number of other points intersect the infinite line first" remained opaque; and thus, he makes further clarifications with reference to al-Jurjānī: The supposed intersection point on the infinite line is only created by the angle formed by the two straight lines on the fixed side of the finite line. One of these two lines is the finite line parallel to the infinite line; whereas the other is a hypothetical second finite line identical in position to the first line. It is this hypothetical line which, when rotated towards the infinite line, gives us the diagonals in the diagram shown above, starting from the fixed point of the finite line and intersecting the infinite line. An angle is then formed on the fixed side of the finite line between the finite line and the hypothetical second line. As demonstrated with reference to Euclidean theorems,[58] the angles formed by two straight lines can be bisected by a third straight line and the new angle can also be bisected in half by another line and each new angle in this way can be bisected by another *ad infinitum*. As a result, the intersection point assumed to occur on the infinite line is revealed perhaps actually to have occurred before at an earlier intersection point. Because the above-mentioned bisecting continues indefinitely, the series of possible intersection points has no beginning. No intersection exists between a finite and an infinite line when parallel, but an intersection must occur after rotating the finite line towards the infinite one. At the same time, due to the possibility of infinitely bisecting an angle, no initial point of possible intersection can exist between the two lines. This is invalid as it is a clear contradiction.[59]

It is worth noting that, the collimation demonstration is grounded on the principle of noncontradiction. As a matter of fact, Üsküdārī also investigated the demonstration around this principle and stressed that the impossibility of the collimation demonstration does not arise from the Euclidean theorem which indicates that the angles formed by two straight lines can continuously be bisected into two by straight lines. This is because Üsküdārī claimed the primary reason for the above-mentioned impossibility is for one of the lines in question to be infinite in itself. When both lines are finite, fewer intersections occur for the moving line with

58 Euclid, I, 9.

59 Üsküdārī, *Sharḥ al-Barāhīn*, 4^b-5^a; al-Jurjānī, *Sharḥ al-Mawāqif*, II, 1185.

the other compared to the infinite bisecting of the angle formed on the fixed side: it will be limited by the length of the finite line.[60] However, the finiteness of this line will lead to a contradiction in relation to the formulation above and is thus invalid.[61]

This formulation put forth by Üsküdārī was elaborated on further by al-Jurjānī, constructing it with the assumption that the finite line in the formulation comes from the center of a circle. In this respect, two lines are assumed: (1) one finite line starting from the center of a circle, and (2) an infinite line lying parallel to it. Next, the finite line is rotated toward the infinite line in a circular motion so that the intersection of the two lines takes place. As was pointed out in this case, an angle between two lines will occur at the center of the circle.[62] Al-Jurjānī performed the next part of the demonstration using the relevant Euclidean theorem,[63] just as Üsküdārī had.[64] Al-Jurjānī's assessments regarding the subject are reminiscent of Ibn Sīnā's employment of the collimation demonstration to show the impossibility of circular motion in an infinite void (see Figure 9). Due to Ibn Sīnā being certain of the existence of circular motion, he rejected the existence of the void.[65] This use from Ibn Sīnā is important in that it shows different functions of the collimation demonstration other than the finitude of extensions.

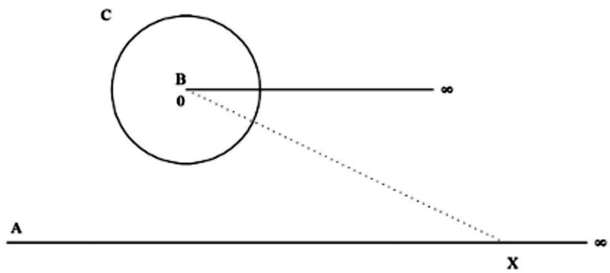


Figure 9. The formulation of the collimation demonstration used for the impossibility of circular motion.

60 By finite line here, I mean the line assumed to be infinite in the above formulation.

61 Üsküdārī, *Sharḥ al-Barāhīn*, 5[a].

62 As pointed out, Üsküdārī seemed to speak of the existence of a second line overlapping the finite line but apart from it coming from the center of the circle. The angle formed by these two lines is the basis for the applicability of the demonstration.

63 Euclid, I, 9.

64 Al-Jurjānī, *Sharḥ al-Mawāqif*, II, 1183.

65 Ibn Sīnā, *ʿUyūn al-ḥikma*, 19–20; See also Zarepour, Avicenna's Philosophy of Mathematics, 89; Ömer Faruk Erdoğan, "Fârâbî ve Ibn Sînâ Felsefesinde Boşluk/Halâ Kavramı", Islâm Araştırmaları 30/1 (2019): 103–109.

2.2. The Demonstrations Against Infinite Regress

Üsküdārī, as pointed out, categorized the rejection of infinite regress in the second part of his treatise into two parts: the well-known and lesser-known demonstrations.

a. Well-Known Demonstrations

Üsküdārī categorized three demonstrations as well-known: i) the mapping demonstration, ii) the correlation demonstration and iii) the throne demonstration. In this part of the present work, each relevant demonstration will be discussed independently under a distinct heading.

i. The Mapping Demonstration

Historically, the mapping demonstration that constitutes the mainstay of the infinite regress discussions, revealed itself in the scholastic discourse of multiple writers. The first traces can be found in the works of the Muʿtazilite Ibrāhim al-Naẓẓām (d. 231/845)[66] through the analogy of inequality between a single mustard seed and an enormous mountain. To build on this argument, al-Naẓẓām further explored the idea of the finitude of things that are characterized by increases and decreases. The next occurred in the works of al-Kindī (d. 231/845), the pioneer of the Arabic Peripatetic school, in a form closer to an Avicennian approach, which will be elucidated below.[67] The mapping demonstration, finally, was first standardized by Ibn Sīnā with its conventional form and then reconstructed by al-Shahristānī (d. 548/1153) within the Sunnī literature.[68]

There have been long-running discussions both in the Sunnī literature and in Islamic intellectual thought regarding the applicability conditions of the

66 Some Orientalist authors associate these discussions of al-Naẓẓām with the Christian theologian John Philoponus (d. 575). See Herbert A. Davidson, "John Philoponus as a Source of Mediaeval Islamic and Jewish Proofs of Creation", Journal of the American Oriental Society 89/2 (1969): 379; For the analogy of inequality between a single mustard seed and an enormous mountain in Ibn Sīnā's works, see, Ibn Sīnā, *The Physics*, II, 276, 305.

67 McGinnis, "Avicennian Infinity", 5–6; Mohammad Saleh Zarepour, "Infinite Magnitudes, Infinite Multitudes, and the Beginning of the Universe", Australasian Journal of Philosophy 99/3 (2021): 472–89.

68 Necmeddin Beşikci, "Celâleddîn Devvânî'de İsbât-ı Vâcib Tartışmaları: Teselsülün İptali Örneği" (Istanbul: Istanbul 29 Mayıs University, 2018) 27.

demonstrations that developed against infinite regress. The projection of these discussions has been effective on issues with theological extensions such as the eternity of the cosmos. Despite these discussions, the demonstration in question has been agreed upon by a majority of Islamic scholars. The efforts of verification (*taḥqīq*) and scrutiny (*tadqīq*) of the demonstrations that were developed to disprove the infinite regress in the literature were mostly carried out through the mapping demonstration. In this respect, Üsküdārī, like al-Jurjānī,[69] described it as "the main proof against infinite regress," underscoring its importance in the literature.

There is a scholarly agreement in the Islamic intellectual tradition on the formulation of the mapping demonstration that goes as follows: Consider a series of causes and effects extending infinitely into the past. Assume that the series starts from a specific effect extending to infinity, and a second series starts one level before this effect and also extends to infinity. Now, corresponding the starting points of these two series by matching the first element of the first series with the first element of the second series, the second element of the first series with the second element of the second series, the third element of the first series with the third element of the second series, and so on results in the presence of increases and decreases between the two series. It follows that either the first series will have an element corresponding to each element of the second series or it will not. If the first series has an element corresponding to each element of the second series, then this requires equality of the part and the whole, as the second series is a sub-series of the first, which is impossible. However, if the first series does not have a corresponding element opposite to each element of the second series, the second series that falls short will be finite; thereafter the first series, which is claimed to be infinite, should also be taken to be finite.[70] This is because increases and decreases between the series are finite amounts, and as noted in the context of the finitude of extension, that which is larger than something finite by a finite amount must itself be finite. However, the formulation presented demonstrates both series to be infinite, which is thus a contradiction. Each potential conclusion from this formulation based on rational division (*taqsīm ʿāqlī*) entails the impossible, and thus an infinite series cannot *actually* exist (see Figure 9).

69 Al-Jurjānī, *Sharḥ al-Mawāqif*, I, 901.

70 Üsküdārī, *Ḥāshiyat Sharḥ al-Qasīda al-Nūniyya*, 12ᵇ; Üsküdārī, *Sharḥ al-Barāhīn*, 5ᵇ.

Figure 10. The diagram of the mapping demonstration.

Consensus was found within the Sunnī tradition regarding the idea that the condition of extra-mental existence by itself is enough for the mapping demonstration to be applicable.[71] However, some later *mutakallimūn* such as ʿAlī al-Qūshjī[72] and Gelenbevī[73] had different views on the applicability conditions of the mapping demonstration. *Falāsifa* such as Ibn Sīnā and his student al-Bahmanyār held that extra-mental existence by itself was not enough for the applicability of the mapping demonstration. Instead, they claimed that the series should be met three conditions for the mapping demonstration to be applicable: (i) extra-mental existence (*wujūd khārijī*), (ii) ordering (*tarattub*; i.e., the elements must be ordered), and (iii) wholeness (*ijtimāʿ*), wherein the corresponding elements must exist simultaneously.[74]

i) Extra-mental existence: As pointed out, consensus was present among the *mutakallimūn* and Peripatetic *falāsifa* regarding extra-mental existence being a sufficient condition for the applicability of the mapping demonstration. Therefore, the infinity of conceptual (*mawhūm*) phenomena lacking ontic status, such as mathematical infinities or natural numbers does not cause a logical problem for the mapping demonstration. This is because the objects that are claimed to be exclusively mathematically infinite do not have an extra-mental existence and thus do not fall within the scope of the mapping demonstration. This is also the case for

71 Jalāl al-dīn al-Dawānī, "al-Risāla fī ithbāt al-wājib al-qadīma", *Salāth Rasāʾil* (Amman: Dār al-Nūr, 2013), 141.

72 ʿAlī al-Qūshjī, *al-Sharḥ al-jadīd lil-Tajrīd* (Qum: Raʾid, 1393), 145.

73 Ismāʿil Gelenbevī, "Risāla fī taḥqīq ʿilm Allāh bil-maʿdūmāt ʿalā madhab al-mutakallimīn", *Rasāʾil al-imtiḥ*ān (Istanbul: Matbāʿat al-ʿĀmira, 1262) 189–92.

74 Ibn Sīnā, *Kītāb al-Najāt*, (Tehran: Dānishgāh-ı Tehran, 1863) 243–245; al-Bahmanyār, *al-Taḥṣīl*, 557; see also McGinnis, "Avicennian Infinity", 19–20; for Üsküdārī's narration of the subject, see Üsküdārī, *al-Talkhīṣ*, 129. I follow McGinnis in translating *ijtimāʿ* and *tarattub* as "wholeness" and "ordering" respectively; see McGinnis, Avicennian Infinity, 20.

potential infinities, as the possible non-existents that could potentially have ontic status do not cause a problem for the mapping demonstration, being as they do not *actually* exist. Therefore, mathematical and potential infinities do not fall under the fallacy of positing an exception to an established rational rule (*takhṣīs fī al-ʿaqliyyāt*); on the contrary, the elements in question are already outside the scope of the mapping demonstration due to their ontological category.

Üsküdārī used an important quotation from al-Rāzī, noting that the condition of extra-mental existence are sufficient for the correspondence of the elements in the mapping demonstration: "After forty years of continuous engagement with this discourse [extra mental existence], my opinion has settled that this condition [extra-mental existence] is enough to correspond [the elements] at infinite times."[75] This statement from al-Rāzī indicated how complex and intricate the subject is and how important this question was to al-Rāzī's agenda. Al-Rāzī, who can be considered the founder of the *mutaʾakhkhir* period, having spent forty years on the subject indicates both the central position of the mapping demonstration in Islamic thought and the problematic nature of the relevant demonstration. As can be seen, al-Rāzī had pointed out the condition of extra-mental existence being enough to allow the applicability of the mapping demonstration and other applicability conditions as put forward by the *falāsifa* to not suggest a necessity in this context.

ii) Ordering Condition:[76] The second condition put forward by *falāsifa* regarding the applicability of the mapping demonstration is an ordering condition. Ibn Sīnā held the ordering condition to be *a priori* and *a posteriori* among the elements of the series, whether in natural (*ṭabīʿī*) or positional (*waḍʿī*) senses.[77] Otherwise, the extra-mental existence of the elements would not be enough for the applicability of the mapping demonstration. The question then arises as to what the idea is behind the ordering condition? As demonstrated, the essential point in the mapping demonstration is the one-to-one correspondence of the first element of the first series with the first element of the second series, the second element of the first series with the second element of the second series, the third element of the first series with the third element of the second series, and so on.

75 This narration by Üsküdārī from al-Rāzī is not word-for-word but paraphrased, see Üsküdārī, *Sharḥ al-Barāhīn*, 6[a]; compare with Fakhr al-dīn al-Rāzī, *al-Matālib al-ʿāliya min al-ʿilm al-ilāhī*, ed. Ahmed Hijāzī al-Sakkā (Beirut: Dār al-Kitāb al-ʿArabī, 1987) IV, 264.

76 Üsküdārī stated in his *al-Talkhīs* that God's non-temporal knowledge can be considered as ordered through its connections (*taʿalluq*). See Üsküdārī, *al-Talkhīs*, 129–31.

77 Ibn Sīnā, *Dānişnāme-i Alāī*, Trans. Murat Demirkol (Istanbul: Türkiye Yazma Eserler Kurumu Başkanlığı, 2013), 204; Zarepour, "Avicenna on Mathematical Infinity", 416.

However, if the elements of the series are non-ordered, then lining up more than one element from the first series with a single element from the second series might be possible,[78] and thus the mapping demonstration that is based on the one-to-one correspondence of the elements would not be applicable.

The *falāsifa* clarified the ordering condition through the analogy of ropes versus pebbles. When the starting points of two ropes are joined together, the remaining parts of these two ropes will be placed in an ordered way. However, this is not the case with lines of pebbles, as more than one pebble may line up in the first series opposite only one pebble in the second series. As a result, one-to-one correspondence is not possible in relation to the series of pebbles unless an ordering condition is provided between the elements of the series.[79]

While the ordering condition of *falāsifa* has been explained in the Sunnī literature, the question is associated with the concept of *tafṣīl*. According to Üsküdārī, *tafṣīl* implies knowing the elements of a series one at a time (i.e., individually).[80] However, according to the *mutakallimūn*, knowing the elements of a series individually is note necessary for correspondence to become applicable. Indeed, this expectation is impossible in itself as the finite mind cannot possibly cover an infinite series one by one. Therefore, holding that either an element will or will not exist opposite another element of the second series is enough for the applicability of the mapping demonstration. This is because the correspondence of the elements is exclusively a mental activity that does not exist externally but only takes place at a theoretical level. Therefore, an ordering condition is not required for the applicability of the correspondence between the elements of the series.

iii) Wholeness Condition (*Ijtimāʿ*): The third condition *falāsifa* gave for the applicability of the mapping demonstration is the wholeness condition, which implies that the elements of the series exist all together at the same time. For *falāsifa*, an element that existed in the past cannot correspond with an element that will exist in the future, as they do not exist simultaneously. It is possible to clarify the wholeness condition by the example that it would not be possible to correspond a person living in or an object existing in BC 2000 with a person living in or an object existing in 2020 AD, since they do not exist together at the same time. From this

78 Üsküdārī, *Ḥāshiyat Sharḥ al-Qasīda al-Nūniyya*, 13[a].

79 Al-Lāhījī, *Shawāriq al-ilhām*, II, 317; ʿAlī al-Qūshjī, *al-Sharḥ al-Jadīd*, 596; al-Dawānī, "al-Risāla fī ithbāt al-wājib al-qadīma", 144.

80 Üsküdārī, *Ḥāshiyat Sharḥ al-Qasīda al-Nūniyya*, 13[a].

point of view, *falāsifa* hold that successive elements such as cause and effect, which have *a priori* and *a posteriori* among them, do not lead to a rational problem in terms of the applicability of the mapping demonstration. Although at first glance this may seem like a purely theoretical discussion, it also involves basic aspects such as the eternity of the cosmos, which is related to the creedal side of Islam.

Similar to ordering condition, Sunnī scholars did not accept Ibn Sīnā's wholeness condition. In this context, the objection developed by Jalāl al-Dīn al-Dawānī (d. 908/1502), who was a significant point of reference for Üsküdārī through the conception of time (*zamān*) and perpetuity (*dahr*), was extremely important as al-Dawānī contended non-whole elements to able to be considered in the same level both on the basis of the conceptual analysis of existence and by pointing out "perpetuity is the container of time," as Ibn Sīnā had mentioned in *al-Taʿlīqāt*.[81] Although the condition of extra-mental existence is necessary for the applicability of the mapping demonstration in a general sense, al-Dawānī held this condition to not be necessary for the actual one-to-one correspondence of elements of a series with each other.[82] Thus, it can be concluded that the application of the mapping demonstration for non-whole elements that did not exist simultaneously is possible. This is because, according to al-Dawānī in particular and Sunnī *mutakallimūn* in general, correspondence implies the elements to be suitable for accepting the correspondence in terms of their essence and lining up an element from the first series opposite an element from the second series to be possible.[83] As a result, no rational necessity existed for the elements to be whole for correspondence to be applicable.

Evaluations put forth on the concepts of time and perpetuity show Ibn Sīna to have the view that time is a more general concept than perpetuity.[84] Based on this point of view, al-Dawānī attracted attention to the fact that existence (i.e., existents) can be considered within the scope of perpetuity; therefore, the presence of existents at any particular time, whether they are whole or successive, can be evaluated at the same level as they are all in perpetuity. Thus, no obstacle is present for the applicability of one-to-one correspondence.[85]

81 Ibn Sīnā, *al-Taʿlīqāt*, 142.

82 Jalāl al-dīn al-Dawānī, *Sharḥ al-ʿAqāʾidi al-ʿAḍuḍiyya* (Beirut: Dāru Iḥyā al-turāth al-ʿArabī, 2016), 43.

83 Al-Dawānī, "al-Risāla fī ithbāt al-wājib al-qadīma", 152.

84 For the concepts of time (*zamān*) and perpetuity (*dahr*) see Eşref Altaş, *Fahreddin er-Râzî'nin Ibn Sînâ Yorumu ve Eleştirisi* (Istanbul: Iz Yayıncılık, 2009) 284–8.

85 Al-Dawānī, *Sharḥ al-ʿAqāʾid*, 43; Necmeddin Beşikci, "Celâleddîn Devvânî'de İsbât-ı Vâcib Tartışmaları", 161–2. Üsküdārī also touched on this subject in his other works. For example, Üsküdārī held that the

i.i. The Objections Against the Mapping Demonstration

The assessments put forward so far have revealed the formulation and applicability conditions of the mapping demonstration. In this section, the focus will briefly be on debates compiled by Üsküdārī about the mapping demonstration.

Üsküdārī's demonstrations regarding the invalidity of infinite regress, formulations of these demonstrations, and discussions put forward in this context were mostly conveyed without any intervention based on al-Dawānī's *al-Risāla fī ithbāt al-wājib al-qadīma*. To be more specific, despite both some structural variations that occurred in the organization of the discussions as well as the formulation Üsküdārī implicitly mentioned about the mapping demonstration, two main objections regarding the demonstration and the solutions proposed to these objections were transmitted verbatim from al-Dawānī's treatise. Üsküdārī should be noted to have declared at the beginning of the relevant section investigating the mapping demonstration that al-Dawānī's explanation, discussion, and evaluations were sufficient regarding the subject.[86] Conversely, the author put forward an important compilation of the relevant discussions, major scholars of the Islamic intellectual tradition, including Fahkr al-dīn al-Rāzī, Najm al-dīn al-Kātibī (d. 675/1277), Ibn Mubārakshāh al-Bukhārī (d. after 784/1382), al-Jurjānī, Mullā Ḥanafī al-Tabrīzī (*fl*. 922/1516) and Mīrzā Jān Shīrāzī (d. 995/1587) had developed up to his period regarding the mapping demonstration.

Üsküdārī mentioned two different objections: one against the possibility of correspondence and the applicability conditions of the mapping demonstration. Adhering to the structure that Üsküdārī followed, we first discuss the possibility of the mapping demonstration, then focus on the objections to the applicability conditions of the mapping demonstration.

The objection Üsküdārī mentioned against the possibility of the mapping demonstration centered on the relationship between the finitude of the second series that falls short and the finitude of the first series, which is claimed to be infinite.[87] Similarly, al-Rāzī admitted that there is not enough clarity on which

presence of the elements in *nafs al-amr* in his *Ḥāshiyat Sharḥ al-Qasīda al-Nūniyya*; or their presence in the *first intellect* or *mala-i a ʿlā* would be enough for the correspondence to be applicable, and by doing so, he mitigated the strong tone of the condition of extra-mental existence. See Üsküdārī, *Ḥāshiyat Sharḥ al-Qasīda al-Nūniyya*, 12[a]; Üsküdārī, *al-Talkhīṣ*, 127.

86 Üsküdārī, *Sharḥ al-Barāhīn*, 5[b]; Although Üsküdārī cites al-Dawānī's *Sharḥ al-ʿAqāʾid al-ʿAḍuḍiyya* as a reference, his quotations are from al-Dawānī's *Risālat ithbāt al-wājib al-qadīma*.

87 Üsküdārī, *Sharḥ al-Barāhīn*, 5[b]; compare with al-Dawānī, "al-Risāla fī ithbāt al-wājib al-qadīma", 151.

criteria the relationship is established, and thus, he mentions that he found the solution of the subject quite complex.[88] As pointed out, the mapping demonstration can be noticed to have two potential conclusions in this formulation: The first of these is impossible as it requires equality between the two series, one of which is part of the other whole. The second, however, requires firstly, the finitude of the second series that falls short, and secondly, the finitude of the first series, which is claimed to be infinite. According to the objection Üsküdārī cited, the lack of equality between the elements of the two series might be because the first is larger than the second by a finite amount in its infinite direction, but it also might be through the impossibility of imagining the corresponding infinite elements individually in finite time with a finite mind. Therefore, the second series that falls short will definitely be cut off (*inqiṭāʿ*) since it already falls short; however, this does not necessarily imply that the first series is correspondingly cut off.[89]

Although this objection regarding the possibility of the mapping demonstration was argued by al-Dawānī through different versions of the demonstration,[90] Üsküdārī confined himself to cite the solution that concentrated on the abstract application of the mapping demonstration. Al-Dawānī maintained the application of the mapping demonstration to be abstractly possible by being able to "imagine an element from the first series opposite each element of the second series." This criterion would be enough for applying the demonstration because, when the elements of the series abstractly correspond, then either i) there is an element from the first series for each element of the second series or ii) there is not. Having a corresponding element for each element from the other series amounts to a contradiction, while not having this denotes finitude.[91] Thus, al-Dawānī, and following him, Üsküdārī revealed the abstract applicability of the mapping demonstration and accordingly its possibility.

88 Fakhr al-dīn al-Rāzī, *al-Mabāḥith al-mashriqiyya fī ʿilm al-ilāhiyyāt wa al-ṭabīʿiyyāt*, (Beirut: Dār al-Kitāb al-ʿArabī, 1990), I, 307; Üsküdārī, *Sharḥ al-Barāhīn*, 6[b]; Üsküdārī's quotation above from al-Rāzī, the narrated debates from *Sharḥ al-Ḥikmat al-ʿayn* and the dialectical dialogue regarding the issue with al-Jurjānī have been quoted word for word from Mīrzā Jān's text. See Mīrzā Jān, *Ḥāshiya ʿalā Risālat ithbāt al-wājib al-qadīma*, Süleymaniye Kütüphanesi, Damad İbrahim Paşa 790, 106[b]–107[a]; compare with Üsküdārī, *Sharḥ al-Barāhīn*, 6[b]–7[b].

89 Al-Dawānī, "al-Risāla fī ithbāt al-wājib al-qadīma", 152.

90 See al-Dawānī, "al-Risāla fī ithbāt al-wājib al-qadīma", 151–5.

91 Üsküdārī, *Sharḥ al-Barāhīn*, 6[b]; compare with al-Dawānī, "al-Risāla fī ithbāt al-wājib al-qadīma", 152; Jalāl al-dīn al-Dawānī, *Unmūzaj al-ʿulūm* (Meshed: Majmaʿ al-buḥūth al-İslāmiyya, 1991), 297.

The second objection Üsküdārī mentioned regarding the mapping demonstration deals with the conditions of its applicability.[92] Üsküdārī conveyed this objection as in his first objection by implicitly referring to al-Dawānī's works. According to this objection, if the mapping demonstration disproves infinite regress, then originated things, rational souls, and numbers must also be finite. Al-Dawānī stated the finitude of originated things and rational souls to not cause a problem for *kalām*, whereas the infinity of numbers is not within the scope of the mapping demonstration due to the idea that numbers are purely conceptual phenomena holding no ontic status.[93] As pointed out, *falāsifa* had also narrowed the scope of the mapping demonstration by stipulating ordering and wholeness conditions for its applicability.

Üsküdārī also dealt with some theological problems arising from the mapping demonstration in his treatise, such as the relationship between the infinity of the items of God's power and the items of God's knowledge and their relationship with the mapping demonstration. The infinity of the items of God's power being potential and the items not cutting off at a limited point suggests that their infinity does not create a problem for the mapping demonstration, as both Sunnī *mutakallimūn* and Peripatetic *falāsifa* considered the condition of extra-mental existence necessary for correspondence to be applied. However, the problem of the infinity of the items of God's knowledge cannot be solved so easily as the relationship between God's knowledge and its *relata* is actual, which requires the actual infinity of the items of God's knowledge. Accordingly, two equally impossible conclusions exist for the mapping demonstration: either the mapping demonstration as the main proof against infinite regress is invalid in the context of the items of God's knowledge, or God's knowledge is finite. However, the former leads to the fallacy of *takhṣīs fī al-ʿaqliyyāt*, whereas the latter creates the negation of theological tenets.[94]

Al-Taftazānī, an important influence on al-Dawānī's infinite regress discussions, responded to this problem related to the items of God's knowledge by claiming the infinity of both the items of God's knowledge and the items of

92 Üsküdārī stated important information to exist about the applicability conditions of the mapping demonstration in al-Dawānī's *al-Risāla fī itbāt al-wājib al-qadīma* and in the glosses written on this treatise by Mullā Ḥanefī and Mīrzā Jān. However, Üsküdārī did not include these points in his treatise. See Üsküdārī, *Sharḥ al-Barāhīn*, 6[a].

93 Üsküdārī, *Sharḥ al-Barāhīn*, 6[a]; al-Dawānī, "al-Risāla fī ithbāt al-wājib al-qadīma", 140; See also Üsküdārī, *Ḥāshiyat Sharḥ al-Qasīda al-Nūniyya*, 13[b]; For similar statements from Üsküdārī, see Üsküdārī, *al-Talkhīṣ*, 127.

94 Üsküdārī, *Sharḥ al-Barāhīn*, 6[a]; al-Dawānī, *Sharḥ al-ʿAqāʾid*, 48.

God's power to be *potential* infinities.[95] Al-Dawānī, on the other hand, proposed a unique solution that eighteenth-century scholars such as Saçaklızāde, Aḳkirmānī (d. 1174/1760), Ismāʿīl al-Ḳōnevī (d. 1195/1781) and Gelenbevī discussed for and against in distinct treatises. Üskūdārī answered this paradox both in the treatises I intend to edit in the present work and in his annotation on Hayālī's (d. 875/1470) *Sharḥ al-Qaṣīdat al-Nūniyya*, by repeating al-Dawānī's views on the subject without additional explanation.[96] Al-Dawānī proposed his solution by focusing on Ibn Sīnā's distinction between *ijmālī* [wholistic] and *tafṣīlī* [individual] knowledge, stating the mapping demonstration to be inapplicable for the case of the items of God's knowledge. This is because the mapping demonstration is based on multiplicity of elements and cannot be applied to simple-structured things. Al-Dawānī held that sciential forms (*ṣūwar ʿilmiyya*) of the items of God's knowledge are simple and wholistic[97] and do not consist of multiple sciential forms relating to each distinct relatum separately. ʿIlm tafṣīlī implies that sciential forms exist for each item of knowledge separately,[98] whereas ʿilm ijmālī is a simple intellection (*taʿaqqul basīṭ*) which the *falāsifa* held to be that acquired from higher principles (*al-mabādiʾ al-ʿāliya*).[99] Therefore, the mapping demonstration based on multiplicity of elements should be inapplicable in the case of the items of God's knowledge, and thus the objection to the mapping demonstration would become invalid.

In the end, the contradiction between the mapping demonstration and the infinity of the items of God's knowledge was solved by al-Dawānī by holding that the mapping demonstration is inapplicable in the context of God's knowledge, and no comment that leads to the invalidity of the mapping demonstration was accepted.[100] This is because such a case will undermine the legitimacy of the mapping demonstration in other areas of application and perhaps cause even more fundamental problems.

95 Al-Taftazānī, *Sharḥ al-Maqāsid*, II, 122.

96 Üsküdārī, *Sharḥ al-Barāhīn*, 6[b]. See also Üsküdārī, *Ḥāshiyat Sharḥ al-Qasīda al-Nūniyya*, 13[a].

97 Al-Dawānī, *Sharḥ al-ʿAqāʾid*, 48–9; For Dawwānī's *ijmāl* theory see Necmeddin Beşikci, "Ismā'īl Gelenbevī's Objections Against Jalāl al-Dīn al-Dawwānī's Solution to the Problem of Infinity in Relation to the Items of God's Knowledge" (Londra: SOAS University of London, 2020), 7–13.

98 Ibn Sīnā, *al-Shifā: Kitāb al-Nafs*, Ed. Ḥasanzāde Āmulī (Qum: Maktab al-Iʿlām al-Islāmī, 1375), 332–3.

99 Ibn Sīnā, *al-Shifā: Kitāb al-Nafs*, 332–3; al-Dawānī, *Sharḥ al-ʿAqāʾid*, 50.

100 Gelenbevī's refutation of al-Dawwanī's *ijmāl* theory took a similar approach, while proposing a solution against contradiction between the mapping demonstration and the finitude of the items of God's knowledge; this is quite important in terms of showing the central position of the mapping demonstration in the literature. See Beşikci, "Solution to the Problem of Infinity", 17, 31–5.

ii. The Correlation Demonstration

The second of the well-known demonstrations that Üsküdārī mentions vis-a-vis the disproving of infinite regress is the correlation demonstration. Similar to the mapping demonstration, Üsküdārī here also established the correlation demonstration on the formulation and discussions al-Dawānī had developed in his *al-Risāla fī ithbāt al-wājib al-qadīma*. According to al-Dawānī, the correlation demonstration goes as follow: If the series of causes (*silsilat al-ʿilal*) proceed *ad infinitum*, then the number of instances of being caused (*maʿlūliyya*) in this series would be one more than the number of instances of causing (*ʿilliyya*). However, al-Dawānī held the consequence of this proposition to be false as breaking numerical symmetry is impossible in correlative elements such as *ʿilliyya* and *maʿlūliyya*, which require one another. However, in the series of infinite causes, all elements except the last effect have the attribute of cause in one respect and of effect in the other. Therefore, if the infinite regress of this series is accepted, then the *maʿlūliyya* of the "last effect" should break the numerical symmetry between the correlative concepts, as the series does not include an element attributed exclusively with *ʿilliyya*. On the contrary, if the series of causes is finite and discontinues at the element able to be considered the first cause and unable to be attributed with *maʿlūliyya*, then equality will occur between the two series, as the first cause will be just the cause and the last effect will be just the effect in this case. As a result, due to the increases and decreases between the two series being finite, both series must be finite.[101]

After giving this formulation of the correlation demonstration, al-Dawānī addressed the objection that this demonstration could not be applied in bidirectionally infinite series.[102] Üsküdārī conveyed the objection mentioned above as well as al-Dawānī's proposed solution to the objection from al-Dawānī's work verbatim, as was the case with the formulation of the demonstration. According to this objection, the numerical symmetry between the cause-and-effect series can only be broken by the final effect that has only the attribution of *maʿlūliyya*. A better understanding regarding this objection can be gained by pointing out the notion of last effect as mentioned in the formulation given above, as the last effect of the

101 Üsküdārī, *Sharḥ al-Barāhīn*, 7^b; compare with al-Dawānī, "al-Risāla fī ithbāt al-wājib al-qadīma", 157; for the differences between the mapping and correlation demonstrations, see al-Lāhījī, *Shawāriq al-ilhām*, II, 327–9.

102 Al-Dawānī, "al-Risāla fī ithbāt al-wājib al-qadīma", 158; al-Dawānī, *Sharḥ al-ʿAqāʾid*, 41.

series not being a cause represents the increase in the number of effects over the causes in the series. However, this conclusion can only appear in unidirectionally infinite series as opposed to bidirectionally infinite series where the final effect is not itself a cause.[103]

Al-Dawānī held the theoretical possibility of the correspondence of elements with one another to be fundamental in the correlation demonstration. Therefore, if any element in the series is hypothetically defined as the limitation, that element will be the same as the last effect in the formulation of the demonstration. More clearly, the element in question will be the last effect and have no attribution of ʿilliyya, thus breaking the numerical symmetry that should be broken between the series of *ʿilliyya* and *maʿlūliyya*.[104] Al-Dawānī's proposed solution regarding the problem mentioned above appears unclear due to being established on the assumption of the presence of a last effect that actually does not exist. This is because, while opponents claimed numerical symmetry would not be broken due to the absence of the final effect, neither would it be strong enough to refute this objection with reference to the presumptive presence of the last effect.

Üsküdārī next dealt with the three different objections to the correlation demonstration in his treatise, pointing out i) the position of the *mutakallimūn* regarding the relationship between correlation demonstration and the ordered non-whole phenomena, ii) the position of the *falāsifa* regarding the relationship between correlation demonstration and the rational souls, and lastly iii) the position of both doctrines regarding the relationship between correlation demonstration and the infinite numbers that present individually in *mala-i aʿlā* and *nafs al-amr*. Üsküdārī then claimed the above-mentioned objection to neither be able to be directed to the *mutakallimūn* due to their conception of time nor to the *falāsifa* due to the eternity of rational souls. Similarly, the third objection would not stand against either the *mutakallimūn* or the *falāsifa*, as the verifiers held the items in God's knowledge to be *ijmālī* and simple.[105] Because the discussion in relation to the objections mentioned above have the same content as the debates presented regarding the objections against the mapping demonstration, no repetition is required here.

103 Üsküdārī, *Sharḥ al-Barāhīn*, 7ᵇ; compare with al-Dawānī, "al-Risāla fī ithbāt al-wājib al-qadīma", 158; See also Necmeddin Beşikci, "Celâleddîn Devvânî'de İsbât-ı Vâcib Tartışmaları", 65.

104 Üsküdārī, *Sharḥ al-Barāhīn*, 7ᵇ–8ᵃ; compare with al-Dawānī, "al-Risāla fī ithbāt al-wājib al-qadīma", 158.

105 Üsküdārī's explanations here show noteworthy similarities with Mīrzā Jān's Gloss on *al-Risāla fī ithbāt al-wājib al-qadīma*. See Üsküdārī, *Sharḥ al-Barāhīn*, 8ᵃ–8ᵇ; compare with Mīrzā Jān, *Ḥāshiya*, 111ᵃ–112ᵇ.

iii. The Throne Demonstration

The third argument that Üsküdārī employed regarding the invalidity of infinite regress was the throne demonstration, first put forward by Shihāb al-Dīn al-Suhrawardī (d. 587/1191).[106] Üsküdārī held Suhrawardī's depiction of this demonstration as ʿarshī to be due to the idea that the demonstration had been established on intuitional (*ḥadsī*) premises.[107] As in the previous two demonstrations, al-Dawānī was the primary source of Üsküdārī's formulation of the throne demonstration as well as the objections that arose against this demonstration. According to Üsküdārī's narration, the demonstration runs as follows: Consider the ordered elements of a series of causes that extend to infinity: The part between each element of the series and its starting point will be finite since the part in between will definitely be limited by two limitations, one being the starting element of the series and the other being each of its elements. It follows that, due to the part between the starting point of the series and each of its elements being finite, the whole series as a result will also be finite because the excess of the entire series over the part between the starting point and the elements in question will only be as large as the addition of two sides of the series.[108]

Al-Dawānī maintained this demonstration to only be understandable through intuition and therefore unusable for invalidating infinite regress.[109] He added all elements of the series being limited between the final effect and the element mentioned above to be as vague as the intended conclusion itself, even if it practically arrived at the same conclusion. Thus, it leads to the fallacy of *petitio principii*. Therefore, al-Dawānī sarcastically addressed those who still desired to use the throne demonstration by remarking how strange that the intended conclusion should remain vague despite the clarity of the proposed premise.[110]

106 Shihāb al-dīn al-Suhrawardī, *al-Alwāḥ al-ʿimādiyya*, (Tehran: Anjumān-i Şahin, 1397), 8; Üsküdārī, *Ḥāshiyat Sharḥ al-Qasīda al-Nūniyya*, 13^{b}.

107 Üsküdārī, *Ḥāshiyat Sharḥ al-Qasīda al-Nūniyya* 13^{b}.

108 Üsküdārī, *Sharḥ al-Barāhīn*, 8^{a}; Üsküdārī, *Ḥāshiyat Sharḥ al-Qasīda al-Nūniyya*, 13^{b}; compare with al-Dawānī, "al-Risāla fī ithbāt al-wājib al-qadīma", 159.

109 Al-Taftazānī noted the throne demonstration to be unusable in the debates due to having been established on intuitional premises. See al-Taftazānī, *Sharḥ al-Maqāsid*, II, 127; Likewise, al-Jurjānī held al-Suhrawardī to have been aware of the weaknesses of this demonstration. See al-Jurjānī, *Sharḥ al-Mawāqif*, I, 909.

110 Üsküdārī, *Sharḥ al-Barāhīn*, 8^{a}; Üsküdārī, *Ḥāshiyat Sharḥ al-Qasīda al-Nūniyya*, 13^{b}–14^{a}; al-Dawānī, "al-Risāla fī ithbāt al-wājib al-qadīma", 161.

After quoting al-Dawānī's statements, Üsküdārī mentioned the objections put forward against the correlation demonstration to also apply to the throne demonstration and the demonstration to have a weak foundation due to being based on intuitional premises.[111]

b. Lesser-known Demonstrations

In the last part of his treatise, Üsküdārī dealt with two more less-common demonstrations in the context of disproving infinite regress that Mīrzā Jān had attributed to prominent scholars from among his contemporaries. The first of these demonstrations aimed to disprove infinite regress by referencing the concepts of odd and even, whereas the second does so by referencing the impossibility of confining infinity between two limits.

i) The first demonstration Üsküdārī put forth by referencing Mīrzā Jān's Gloss on *al-Risāla fī ithbāt al-wājib al-qadīma* by al-Dawānī has already been mentioned in the works of both al-Ghazzālī and al-Taftazānī in a relatively different form.[112] This demonstration goes as follows: If an ordered series of causes extends infinitely, the total number of elements in the series must be either even or odd. If the number of elements is odd, an even number can be reached by adding one. Thus, in both cases (i.e., whether initially odd or even), the series of elements can be divided into two equal parts. In this case, due to the half on the finite side being between the starting point and the midpoint of the series, the infinity will be confined between two limits. If on the other hand, the half on the finite side of the series is finite, as both the other half and multiples of the finite are finite, the other half will also have to be finite due to being equal.[113]

Üsküdārī here also conveyed Mīrzā Jān's assessments regarding the concept of infinity, in which Mīrzā Jān dismissed the possibility of infinity being attributed

111 As pointed out, the throne demonstration has been subjected to strict criticism by the major scholars in the literature. In this respect, al-Siyālkūtī importantly rejected the objections against the aforementioned demonstration with reference to the premise indicating that "which is larger than a finite by a finite amount must itself be finite". ʿAbd al-ḥakīm al-Siyālkūtī, *Ḥāshiya ʿalā Sharḥ al-Maw*āqif (Istanbul: Matbāʿat al-ʿĀmira, 1311), I, 546. For Mehmet Fatih Arslan's critical evaluations on the subject, see Mehmet Fatih Arslan, "Celâleddîn Devvânî'nin Varlık Felsefesi" (PhD dissertation, Istanbul University Sosyal Bilimler Enstitüsü, 2015), 177.

112 al-Ghazzālī, *al-Iqṭiṣād fī al-iʿtiqād* (Beirut: Dār al-Minhāj, 2016), 135–6; al-Taftazānī, *Sharḥ al-Maqāsid*, II, 126–7.

113 Mīrzā Jān, *Ḥāshiya*, 111[b]–112[a]; compare with Üsküdārī, *Sharḥ al-Barāhīn*, 9[a].

either oddness or evenness, properties which belong exclusively to *finite* numbers. Mīrzā Jān then noted that series with an infinite side cannot be divided into two, four, or different numbers that divide themselves into equal parts. Even if a sum of amounts is subtracted from infinity, the rest will still be infinite. Thus, describe infinity, which does not express mathematical quantity, by using oddness or evenness, which belongs to finite numbers, is impossible,[114] because infinity is not a number but just a concept defining an idea that cannot be described by finite numbers.

Üsküdārī did not respond to this objection. While admitting its weakness, clarifying some implicit issues and reconsidering the demonstration in question would be useful. The formulation should be noted to not be seeking to prove the finitude of numbers or mathematical objects but rather external referents (*miṣdāq*) of numbers (i.e., numbered things). Thus, although infinity does not mean a mathematical quantity, such an assumption can be made on the level of objects to which the numbers refer. In addition, when considering that the concepts of evenness and oddness are mental phenomena in themselves, reconstructing the demonstration in this sense may be useful.

ii) The second demonstration that Üsküdārī put forward with reference to Mīrzā Jān is as follows: Consider an infinite series. Between any element of the series and the totality of elements will occur an infinite number of increasingly larger combinations (*majmūʿāt*). The idea that a number contains within it a combination for every smaller number appears to be behind this demonstration (e.g., two is a part of three, the number ten can consist of different combinations of the numbers below it [1-9]). As a result, this idea will imply infinity being confined between two limits, which leads to ontological impossibility in relation to infinity.[115]

In response to this formulation, Mīrzā Jān discussed the claim that the part between the two limitations of the set is part of one another. According to the additive system of numeration, numbers do not consist of different combinations of units amounting to every number below them but rather only of units.[116] Therefore, infinite collections of numbers do not exist between any element in the

114 Mīrzā Jān, Ḥāshiya, 112[a]; compare with Üsküdārī, *Sharḥ al-Barāhīn*, 9[a].

115 Mīrzā Jān, *Ḥāshiya*, 112[a]; compare with Üsküdārī, *Sharḥ al-Barāhīn*, 9[a].

116 Al-Dawānī's statements on this subject are similar to those of Mīrzā Jān. See al-Dawānī, *Sharḥ al-ʿAqāʾid*, 46. For assessments on the definitions of numbers in Aristotle and that numbers consist of the ones under itself, see Ihsan Fazlıoğlu, "Kaynakları ve Etkileri Açısından Aristoteles'in Sayı Tanımı", *Aded ile Mikdār: İslām-Türk Felsefe-Bilim Tarihinin Mathemata Mā-cerāsı* (Istanbul: Ketebe, 2020), 15–25.

series and its total, but only units occur. This is the case for numbers as well as for numbered things that numbers refers to. Üsküdārī held the fallacy of *petitio principii* as directed against the throne demonstration to also be applicable for this demonstration.[117]

Conclusion

The question of infinity has been the central element of many discussions with theological and philosophical implications such as the existence of a necessary existent. This issue, which has been discussed since the early Muʿtazilite scholars, has become a cosmopolitan theological and philosophical tradition in which scholars from different intellectual backgrounds have expressed their views through writing distinct treatise. That an important Ottoman Turkish figure in the *mutaʾakhkhir kalām* literature like Üsküdārī would pen an independent treatise on the question of infinity demonstrates the continuity and central position of the issue in Islamic thought. Üsküdārī's reproach that the treatises written in this field were either too long or too short such that the subject had not been properly addressed influenced his decision to write such a work. This importantly alludes to both the intellectual vitality of the infinity question in Ottoman circles and its prominence for Üsküdārī.

Üsküdārī's treatise on the finitude of extensions and infinite regress has a systematic and compendious structure. In his treatise, Üsküdārī comprehensively presents prominent demonstrations regarding the question of infinity, the objections directed to these demonstrations, and the assessments introduced over the subject by the previous major scholars up to his period. In this respect, Üsküdārī's treatise suggests both the approval of the scholarship produced in theology and philosophy literature on the finitude of extensions and infinite regress by a verifier polymath like Üsküdārī as well as the scientific quality of the texts and passages selected in the compilation in terms of source value. Although the treatise deserves to be appreciated as a successfully compiled text, the abundance of verbatim quotations from the works of al-Jurjānī, al-Dawānī and Mīrzā Jān, often without commentary or modification, raises the question of originality in terms of content.

117 Mīrzā Jān, *Ḥāshiya*, 112[a]; compare with Üsküdārī, *Sharḥ al-Barāhīn*, 9[a].

According to Üsküdārī, infinity in extensions and infinite regress is impossible. Though scholars have varying approaches toward potential and mathematical infinities, establishing the actual infinity of external phenomena on the infinity of potential and mathematical objects would be a reductionist attitude. In this context, Üsküdārī examined both the ladder and collimation demonstrations in his discussions on the finitude of extensions. With respect to infinite regress, he examined the mapping, correlation, and throne demonstrations as the well-known demonstrations in addition to two different additional demonstrations Mīrzā Jān had attributed to prominent scholars from among his contemporaries. While doing so, Üsküdārī also discussed the paradigmatic differences related to the mapping and correlation demonstrations, specifically addressing their theological extensions such as the eternity of the cosmos and the (in)finitude of rational souls.

All the demonstrations Üsküdārī presented are fundamentally grounded on the following axiomatic principles: the inequality of the part and the whole, the necessity of the things that *actually* exist to be finite; and the law of noncontradiction.

As a result, the present work reveals the ideational influence of the ladder demonstration and collimation demonstration in Ottoman thought, which can be traced back to Aristotle in the context of the finitude of extensions; and also five different demonstrations, three of which are well-known via Üsküdārī's compilation. Moreover, at the beginning of each chapter, Üsküdārī revealed the historical background of the demonstrations, thus contextualizing himself within the broader scope of Islamic intellectual thought. Lastly, the paper investigated the contributions made by major scholars in the literature so as to display the novelty and continuity of the demonstrations.

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شرح البراهين الخمسة المشهورة في الحكمة لإثبات تناهي الأبعاد وبطلان التسلسل مع أسئلتها وأجوبتها

[١ظ]

بسم الله الرحمن الرحيم

(لك الحمد يا من لا يبلغ الأوهامُ كنهَ ثنائه ومجده، ولا يمكن على وجه الكمال إتيانُ شكره وحمده، وعلى نبيِّك وآله الصلاة والسلام، ما دامت الدهور والأعوام.

وبعد؛ فيقول العبد الفقيرِ إلى ربِّه الباري محمد أمين بنِ محمد الأسكداري: لَمَّا كان للحكماء براهين على أنَّ الأبعاد كلَّها متناهية، منها البرهان السلَّميُّ، ومنها برهان المسامتة، ولهم على إبطال التسلسل براهين مشهورة وغير مشهورة، ومن المشهورة: برهان التطبيق وبرهان التضايف والبرهان العرشي؛ ومن غير المشهورة برهانان ذكرهما الفاضل مِيرزاجان في المسلك الثاني من إثبات الواجب، وكانت[١] عبارة القوم في تقريرها وبيان ما يَرِد عليها لا تخلو عن التطويل والإطناب المملِّ وعن الإيجاز والاختصار المخلِّ؛ أردتُ تقريرها بعبارات عارية عن التطويل والإملال وعن الإيجاز والإخلال، فأفردتُ رسالة في بيانها وإيضاحها، وبيان ما يرد عليها وما يجاب به عنه من أقوى الإيرادات وجوابه القوي (ثم شرحتُها وبيَّنتُ سائر الإيرادات وسائر الأجوبة تسهيلًا للطلاب،)ومن الله تعالى أستمدُّ في كلِّ باب، وإليه المرجع والمآب.

وفيها مسلكان:

المسلك الأول في بيان أن الأبعاد كلَّها متناهية

وفيه فصلان:

الفصل الأول في تحقيق البرهان السلَّميِّ

اعلم أن مسألة تناهي الأبعاد عُدَّت من الطبيعيِّ، وهي من المبادئ التصديقيَّة لمسائلَ أخرى: منها مسألة تحدُّد الجهات) وهي من مسائل العلم الطبيعيِّ، (ومنها مسألة امتناع انفكاك الصورة عن الهَيولى)[٢] وهي من مسائل العلم الإلَهيِّ كما قال الفاضل اللَّاري.

١ معطوف على قوله «لما كان» إلخ. «منه»

٢ فإنَّ الصورة في ذاتها من المجرَّدات؛ وإن كانت في تشكُّلها محتاجة إلى المادَّة. «منه»

والبُعد جنس تحته ثلاثة أنواع: الطول، والعرض، والعمق.

(واستدلُّوا على تناهي الأبعاد بالبرهان السلَّميِّ

وتقريره أن يقال: الأبعاد كلُّها[٣] [٢و] **متناهيةٌ؛ وإلّا لَأمكن أن يخرج من مبدأ واحد امتدادان على نسق واحد، كأنَّها ساقا مثلَّث، وكلَّما كانا أعظم كان البُعد بينهما أزيد)**[٤] فلو امتدَّا إلى غير النهاية لأمكن بينهما بُعد غير متناه، وهو باطل لكونه محصورًا بين حاصريْن، وهما: الامتدادان المخرَجان على نسق واحد.

(المراد بكونها على نسق واحد أن يكون البُعد بينهما متزايدًا على سبيل المساواة) وفائدته أنَّ المشتمل على الأجزاء المتساوية الغير المتناهية غير متناه بداهةً، فتكون الملازَمة المستفادة من قوله: فلو امتدَّا إلى غير النهاية لأمكن بينهما بُعد غير متناه؛ ثابتةً بداهة بخلاف البُعد المشتمل على الأجزاء المتناقصة الغير المتناهية. فإنَّ كونه غيرَ متناه نظريٌّ، ويكفي[٥] هذا القدر من الفائدة؛ وإن كان البُعد المشتمل على الأجزاء المتزايدة الغير المتناهية غير متناه بداهةً أيضًا.

(فيندفع ما أورد على الملازمة المذكورة، إنَّا لا نسلِّم أنَّه يلزم وجود بُعد غير متناه بين الخطَّين، غايةُ ما في الباب أن يكون من التزايد إلى غير النهاية، لكن لا يلزم منه أن يكون هناك بُعد زائد إلى غير النهاية؛ بل كلُّ بُعد فُرض فهو لا يزيد على بُعد تحته متناهٍ إلا بقدر متناه، والزائد على المتناهي بقدر متناه لا بدَّ أن يكون متناهيًا، وهذا كالعدد، يقبل الزيادة إلى غير النهاية، مع أنَّ كلَّ مرتبة من مراتب النظام الغير المتناهي عدد متناهي، لا يزيد على مرتبة أخرى تحتها إلا بواحد.)[٦]

وتحقيق ذلك: أنَّا إذا فرضنا الانفراج بينهما بقدر امتدادهما لم يتَّجه إليه هذا المنع، لأنَّه إذا امتدَّ كلُّ واحد منها ذراعًا كان الانفراج بينهما ذراعًا أيضًا، وإذا امتدَّ مئة ذراع مثلا كان الانفراج بينهما مئة ذراع أيضًا، فإذا امتدَّ إلى غير النهاية كان الانفراج أيضًا غير متناه قطعًا، فيلزم انحصار ما لا يتناهى بين حاصريْن لزومًا ظاهرًا، ولا مجال لأن يمنع جواز خروجها على هذا النسق، أعني كونَ الامتداد مساويًا للانفراج، كما يشهد به الأصول الهندسيَّة.

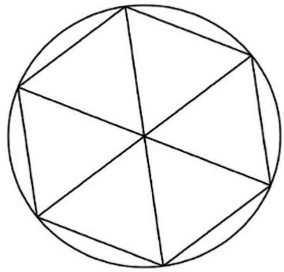
٣ خلافًا لمن ذهب إلى أنَّ الفضاء الذي هو وراء العالم، وهو البُعد المجرَّد عن المادَّة غير متناه. «منه»

٤ انظر: **الإشارات والتنبيهات** لابن سينا، ٢: ١٨٥-١٩٠.

٥ فيه إشارة إلى الجواب عمَّا أورده قاضي مير من أنَّه لا فائدة في فرض تساوي الزيادات؛ لأن البُعد المشتمل على الزيادات الغير المتناهية غير متناه، سواء كانت تلك الزيادات متساوية أو متناقصة أو متزايدة، لأنَّها زيادات مقداريَّة، وكلما تزداد يزيد المقدار. «منه»

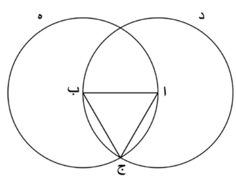
٦ انظر: **الطبيعيات (الشفاء)** لابن سينا، ١:٢١٥

وبيانه[7] أنَّ لنا أن نفرض محيطَ دائرة وتقسيمَه ستَّة أقسام متساوية، ونصل بين نقطتين متقابلتين من مبادئ تلك الأقسام، فيحصل هناك خطوطٌ ثلاثةٌ متقاطعةٌ على مركز دائرة هي أقطارها، وتحصل عند المركز [٢ظ] ستَّة زوايا متساوية، ومتساويةُ القِسِيِّ،[8] التي هي مقاديرها[9] [بالشكل السادس والعشرين من ثالثة الأصول]، فكلُّ واحد من تلك الزوايا ثلثا قائمة، لأنَّ المركز؛ بل كلُّ نقطة تفرض على سطح يحيط به أربعُ قائمة، وقد قسِّمت تلك القوائم الأربع ههنا أقسامًا ستَّة متساوية، فكانت[10] كلُّ واحدة منها ثلثيْ قائمة يحيط بها ضلعان، كلٌّ منها نصف قُطر من تلك الأقطار، وهذان الضلعان هما اللذان يكون الانفراج بينهما متساويًا.



وبهذا التحقيق ظهر اندفاع ما أُورد على الملازَمة المذكورة من أنَّ المحال –أعني انحصارَ ما لا يتناهى بين الحاصرين– إنَّما نشأ من فرض أمرين متناقضين، وهما: تناهي الضلعين، ولا تناهيهما،

٧ وله بيان آخر ذكره في المقالة الأولى من كتاب أقليدس، وهو أنَّ كلَّ خط مستقيم محدود، قلنا أن نرسم عليه مثلَّثًا متساوي الأضلاع مثلا على خط «ا ب»، فلنرسم على نقطتيْ «ا ب» ببُعد الخط دائرتيْ «ب ج د» «ا ج هـ» ونصل «ا ج» «ج ب»، فمثلث «ا ج ب» المرسوم على «ا ب» متساوي الأوضاع، وذلك لأن «ا ب» «ا ج» متساويان، وكذلك «ب ا» «ب ج»، فـ«ا ج» «ب ج» المساويان لـ«ا ب» متساويان، فأضلاع مثلث «ا ب ج» متساوية، وذلك ما أردناه، وهذه صورته:



«منه»

انظر: **أقليدس**، المقالة الأولى، ١.

٨ جمع «قوس»، وهو قطعة من الدائرة. «منه»

٩ أي مقادير الدائرة. «منه»

١٠ فإنا إذا قسَّمنا أربع قائمة ثنتي عشرة أقسام متساوية، كانت كلُّ واحدة من تلك الأقسام ثلث قائمة، فإذا قسَّمناها ستَّة أقسام متساوية كانت كلُّ واحدة منها ثلثي قائمة. «منه»

كفرض وجود زيد وعدمه، فإنَّ وجود خطٍّ واصل بين الضلعين يستحيل مع عدم تناهيهما،[١١] فإنَّ الخطَّ الواصل بينهما إنَّما يصل بين النقطتين، فهما ينتهيان بتينك النقطتين، كيف لا! ويكون كلٌّ منها محصورًا بين الضلع الآخر وبين الخطِّ الواصل، فيكونان متناهيين، وقد فرضناهما غير متناهيين، فالمحال إنَّما نشأ من فرض المحال، إذ المحال يجوز أن يستلزم محالًا آخر، ولم ينشأ هذا المحال من فرض أمر واحد –هو عدم تناهي الضلعين– حتى يكون محالًا لاستلزامه المحال.

وذلك[١٢] لأنَّا لا نفرض مع فرض الخطَّين أن يكون بين طرفيهما خطٌّ واصل حتى يلزم فرض أمرين متناقضين، كما ظنَّه المورد ويشعر به بحثه؛ بل نفرض ضلعيْ زاوية مخصوصة هي ثلثا قائمة غيرَ متناهيين، على تقدير لا تناهي الأبعاد، ومن البيِّـن جواز هذا الفرض على هذا التقدير، ويلزم من ذلك أن يكون بينهما انفراج يكون نسبته إلى الضلعين المفروضين مثلَ نسبة[١٣] متناه إلى متناه، أو انفراج يصحُّ[١٤] أن يفرض فيه خطوطٌ متساويةٌ للضلعين المفروضين، وكلٌّ منهما مستلزِم[١٥] لتناهي الضلعين، المفروض لا تناهيهما، فوجود الضلعين الغير المتناهيين مستلزِم لعدمهما، وما يستلزم وجودُه عدمَه لا محالة محال، [٣و] فإلَّا تناهي الأبعاد المقتضي لجواز الضلعين الغير المتناهييـْن يكون أيضًا محالًا.

(وقد يجاب عن المنع المذكور بتحرير الدليل بأن يقال: لو أمكنتْ الأبعاد الغير المتناهية لـَجاز خروج الخطَّيـْن على هيئة ساقيْ المثلَّث، ويمكن أن يفرض منها أبعادٌ متزايدةٌ غيرُ متناهية بالفعل، لا كالعدد، كما ظنَّه المانع؛ فإنَّ العدد غير متناه بمعنى أنَّه لا يقف في مرتبة، وليس غير متناه بالفعل، وعلى فرض وقع هناك أبعادٌ غير متناهية بالفعل، ولا شكَ أنَّ كلَّ بُعد من تلك الأبعاد الغير المتناهية زائدٌ على البُعد الذي تحته، وإذا كان كذلك فنفرض خطًّا ينطبق على خطٍّ تحت تلك الخطوط الموهومة، ونفرض أنَّ طوله ذراع والطول الذي فوقه ذراعان، وهكذا كلُّ بُعد هو فوق بُعد يكون أزيدَ مقدارًا من البُعد الذي هو تحته، فنفرض ذهابَ ذلك الخطِّ من مبدأ فرضناه إلى غير النهاية في مسافة بين الخطيـْن، ونفرض أنَّه في كلِّ مرتبة يتَّصل به زيادة حتى ينطبق مع بُعد كان في تلك المرتبة، فلو ذهب إلى غير النهاية لانضمَّ إليه زيادات غير متناهية لكلٍّ منها مقدار، فانضمَّ إليه مقادير غير متناهية،

١١ انظر: **شوارق الإلهام** للاهيجي، ٣: ٣٧٧.

١٢ ظهور اندفاعه بما ذكر. «منه»

١٣ من أقصريَّة الإنفراج وأطوليَّته. «منه»

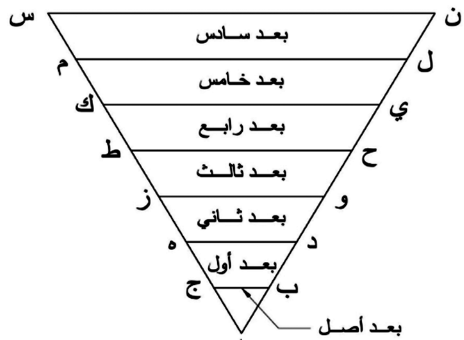
١٤ أي في الواقع من غير حاجة إلى الفرض، كما توهَّمه المورد. «منه»

١٥ لأنَّ كلًّا من الانفراجين على كِلا التقديرين ذهبا مع الضلعين مع كونها محصورًا بين حاصرين، فهما متناهيان، فالضلعان أيضًا كذلك، إذ لا يزيد شيء منهما على شيء من الآخر. «منه»

فيصير ذلك الخط مشتمِلا على مقادير غير متناهية بالفعل، والمشتمِل على مقادير غير متناهية بالفعل غير متناه بالفعل، وذلك الخط غير متناه بالفعل، مع كونه محصورًا بين حاصرين.)

قيل: لا يتَّضح هذه الملازَمة حقَّ الاتِّضاح، بحيث يندفع عنها المنعُ المذكور إلا بتمهيد مقدِّمات ثلاث:

الأولى: أنَّ الخطَّين الممتدَّين من مبدأ واحد إلى غير النهاية، يمكن أن يفرض بينهما أبعادٌ غير متناهية بحسب العدد، ومتزايدة بقدر واحد، مثلًا لو امتدَّ من مبدأ واحد إلى غير النهاية، مثل نقطة «ا»، خطَّان غير متناهيـين لأمكن أن نفرض على الخطَّين نقطتين متساويتي البُعد عن نقطة «ا»، كنقطتيْ «ب» «ج»، بحيث لو وصَّلنا بينها بخط «ب ج» لَـكان مساويًا لكلٍّ من خطيْ «ا ب» «ا ج»، حتى يكون «ا ب ج» مثلثًا مساويَ الأضلاع، لنفرض أن كلًّا من الأضلاع ذراع، وأن نفرض عليهما نقطتيـن أخريين متساويتي البُعد عن نقطتي «ب» «ج» كنقطتي «د» «هـ»، بحيث يكون بُعدهما عن «ب» «ج» كبُعديْ «ب» «ج» عن «ا»، ويكون كلٌّ من «ا د» «ا هـ» ذراعين حتى لو وصَّلنا بين نقطتين «د» «هـ» بخط «د هـ» لَـكان كلُّ ضلع من مثلَّث «ا د هـ» (ذراعين)، وإن نفرض عليهما نقطتين [٣ظ] أخريين على الوجه المذكور، كنقطتيْ «و» «ز»، ونصل بينهما بخطٍّ حتّى يكون كلٌّ من أضلاع «ا و ز» ثلاثة أذرع، ثم نفرض «ح» «ط»، ثم «ي» «ك»، ثم «ل» «م»، ثم «ن» «س»، ونصل بينهما بخطوط «ح ط» «[ي] ك» «ل م» «ن س» على الوجه المذكور، وهكذا إلى غير النهاية، ولنسمِّ خطَ «ب ج» «البُعد الأصل»، والذي بعدَه أعني «د هـ» «البعدَ الأول»، و«و ز» «البعد الثاني» و«ح ط» «البعد الثالث» وعلى هذا الترتيب.



المقدَّمة الثانية: أنَّ كلًّا من تلك الأبعاد مشتمل على البُعد الذي قبله وعلى الزيادة، مثل البُعد الأول أعني «د هـ» مشتمِل على البُعد الأصل، أعني «ب ج» وزيادة ذراع، والبُعد الثاني، أعني «و ز» مشتمِل على «د ه» وزيادة ذراع، وهكذا إلى غير النهاية، فكلُّ بُعد من الأبعاد المفروضة فوق البُعد الأصل مشتمِلٌ على زيادة، فههنا زيادات غير متناهية بعدد الأبعاد الغير المتناهية التي فوق البُعد الأصل.

المقدمة الثالثة: أنَّ كلَّ جملة من الزيادات الغير المتناهية، فإنَّها موجودة في بُعد واحد فوق الأبعاد المشتمِلة على تلك الجملة؛ وإلَّا لم يوجد فوق تلك الأبعاد بُعد، فيلزم أن يوجد في تلك الأبعاد بُعد، هو آخر الأبعاد، ويلزم من هذا تناهي الخطَّين على تقدير عدم تناهيهما، وأنَّه محال. مثلا الزيادتان الموجودتان في البُعد الأوّل والثاني موجودتان في البُعد الثالث، لأن البُعد الثالث مشتمِل على البُعد الثاني المشتمِل على البُعد الأول، فيشتمل عليها وعلى زيادتها بالضرورة، وكذا الزيادات الثلاث المشتمِل عليها الأبعاد الثلاثة موجودةٌ في البُعد الرابع، وهكذا إلى ما لا نهاية له.

وإذا تمهَّدت المقدِّمات الثلاث فنقول: إن امتدَّ الخطَّان الخارجان من مبدأ واحد إلى غير النهاية؛ لزم أن يوجد بينهما أبعاد غير متناهية متزايدة بقدر واحد، وهذا بحكم المقدِّمة الأولى، فيوجد بينها زياداتٌ غير متناهية بحكم المقدِّمة الثانية، فبحكم المقدِّمة الثالثة توجد تلك الزيادات الغير المتناهية في بُعد واحد، والبُعد المشتمِل على الزيادات الغير المتناهية غير متناه، فيوجد بين الخطَّين بُعد واحد غير متناه، مع كونه محصورًا [٤و] بين حاصرين، فثبت ما ادَّعيناه من الملازَمة، واندفع المنع المذكور.

وأورد عليه أنَّه لا يلزم من المقدِّمة الثالثة وجود بُعد واحد مشتمِل على تلك الزيادات الغير المتناهية، لأنَّا لا نسلِّم أنَّه إذا كان كلُّ جملة من الزيادات الغير المتناهية في بُعد، يجب أن يكون جميع الزيادات في بُعد، لجواز أن لا يكون الحكم على كلِّ واحد حكمًا على الكلِّ المجموعيِّ، فإنَّ كلَّ واحد من الإنسان يشبعه هذا الرغيف ويسعه هذه الدار، والمجموع ليس كذلك.[١٦]

وقد يقال في دفع هذا النظر: أنَّ عدد الزيادات المجتمعة في بُعد واحد مساوٍ لعدد الزيادات والأبعاد المشتملة عليها، فإذا كانا غيرَ متناهية، كان عدد الزيادات المجتمعة في بُعد كذلك بالضرورة.

(وأورد على بطلان اللازم -وهو وجود ما لا يتناهى محصورًا بين حاصرين- أنَّه جائز؛ بل واقع، فإن إقليدس بيـَّن أنَّ الزاوية الحاصلة من محيط الدائرة والخطِّ المماسِّ لها؛ أحدُّ الزوايا،[١٧] وهذا

١٦ لأن السالبة الجزئية -وهي قولنا «بعض الإنسان لا يشبعه هذا الرغيف ولا يسعه هذه الدار»- نقيض الموجبة الكلية -التي فرض صدقها- المثبت للحكم في كل فرد، ولا تقتضي الموجبة الكلية المثبت للحكم في الكل من حيث هو الكل، فإنَّ هذه شخصيَّته، نقيضها السلب عن الكل المجموعيِّ هذا. «منه»

١٧ قيل: «الأمثال» جمع «مثل»، وهو الاتِّحاد في النوع، فلا يلزم من كون الزوايا الأخر أمثالها كونها متساوية لها في الحدَّة، فلا منافاة بين كونها أحدَّ وبين اشتمال القائمة على أمثالها، وقد يدفع المنافاة أيضًا، بأنَّ المراد بكونها أحدَّ أن لا أحدَّ منها وإن كان ما يساوي في الحدَّة، «منه»

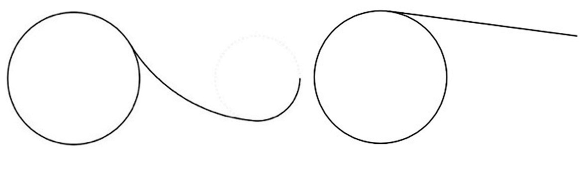
الخطُّ يقع عمودًا على طرف قُطر من الدائرة، فلا بدَّ أن تكون القائمة مشتملة على أمثالها بعدَّة غير متناهية، مع الانحصار بين الحاصرين، وإلَّا يلزم أن لا يكون تلك الزاوية أحدَّ، لوجود أصغر منها عند قسمة ما بقي من القائمة بعد الانقسام بأضعافها) [١٨] وذلك لأنَّ كلَّ زاوية مستقيمةِ الخطين، يمكن تنصيفها بخطٍّ مستقيم، على ما بيَّنه إقليدس، ولا شكَّ أنَّ كلَّ واحد من النصفين زاوية مستقيمة الخطين، فتقبل الانقسام إلى غير النهاية.

فإذا تمهَّد هذا، فنقول: لا بدَّ أن تكون تلك القائمة مشتملةً على أمثال أحدِّ الزوايا بعدَّة غير متناهية، وإلا يلزم أن لا يكون تلك الزاوية أحدَّ وغيرَ منقسمة، لانقسامها ووجود أصغر منها عند قسمة ما بقي من القائمة التي تقبل القسمة إلى غير النهاية بأضعاف عدة أحدِّ الزوايا، وذلك باطل لأنَّه خلاف المفروض، فلا بدَّ أن تكون تلك القائمة مشتمِلة على أمثال أحدِّ الزوايا بعدَّة غير متناهية، مع أنَّها محصورة بين حاصرين: أحدهما القُطر والآخر الخط المُماسُّ.

(وجوابه: أنَّ امتداد القائمة متناه، واشتمَالها على أمثالها [١٩] **بعدَّة غير متناهية؛ إنَّما هو بالقّوة، فليس إلا انحصار ما لا يتناهى بالقوَّة بين الحاصريْن، والكلام ليس فيه، إذ هو ليس بمحال؛ بل المحال اللازم ههنا إنَّما هو [٤ظ] انحصار ما لا يتناهى بالفعل بين الحاصرين.)**

وقد يجاب أيضًا بقدح ما ذكره إقليدس بأن يقال لا نسلِّم أنَّ الزاوية المذكورة أحدُّ وغير منقسمة، كيف! والزاوية إمَّا من قبيل الكمِّ أو الكيف العارض للكمِّ، فلا بدَّ أن تكون قابلة للقسمة بالفعل بالذات أو بالتبع، فكيف تكون أحدَّ!

وقد يقال: لا نسلِّم كون الزاوية المذكورة أحدَّ الزوايا، كيف! والزاوية الحاصلة من محيط الدائرة والخط المُنْحَنِي المماسِّ للدائرة إذا كان محدَّبُه إلى محيطها أحدّ منها هكذا:

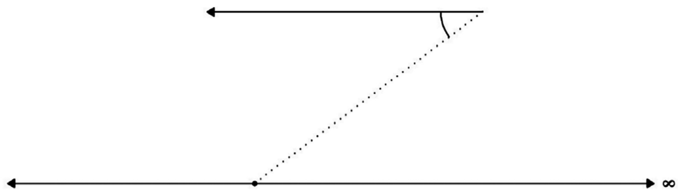


١٨ الحصار القائمة، وهي التي لا تقبل القسمة أصلًا وإلَّا لكان نصفها أحدَّ منها، فلا تكون أحدَّ. «منه»

١٩ أي: في العدد لكونه عدَّة الزوايا الأحد متناهية وعدم كون انقسامات القائمة المشتملة عليها متناهية. «منه»

الفصل الثاني في تحقيق برهان المسامتة

(وتقريره: **أنَّ الأبعاد كلَّها متناهية؛ لأنَّ خطًّا متناهيًا إذا كان موازيًا لغير خطٍّ متناه)**[٢٠] بحيث لو أُخرجا إلى غير النهاية لم يكن بينهما ملاقاة، لكون البُعد بينهما على سواء، **(فتحرَّك)** ذلك الخط المتناهي **(نحوَه)**، أي جانبَ الخط الغير المتناهي **(حتَّى صار مسامِتًا له، أي صار بحيث لو أُخرج على الاستقامة)** من غير كونه مُنحنيًا **(ليقاطعه)** أي ليقاطع الخط الغير المتناهي على ما بيِّن في الهندسة -بل ذلك بدهي لا يحتاج إلى البرهان- **(فلا بدَّ من أن يكون في الخطِّ الغير المتناهي نقطة يكون حدوث المسامتة أوَّلا)** أي ابتداء من غير سبق مسامتة أخرى عليها **(بالنسبة إليها)** أي إلى تلك النقطة، وذلك لأنَّ المسامتة حادثة لكونها معدومة حال الموازاة المتقدِّمة عليها، وكلُّ حادث فله أوَّل، فللمسامتة أوَّل، ولـمَّا كان تقاطع الخطين لا يتصوَّر إلا[٢١] على النقطة؛ لزم أن يكون في الخطِّ الغير المتناهي نقطةٌ، يكون حدوث المسامتة أوَّلا بالنسبة إليها، لكن ذلك اللازم محال، **(إذ كلُّ نقطة نفرضها كذلك)** أي أوَّل نقطة المسامتة، **(فالمسامتة حاصلة بنقطة أخرى قبلها)** من جانب لا تناهي الخطِّ.[٢٢]



وذلك لأنَّ المسامتة مع أيَّة نقطة تُفرَض، إنَّما يحصل بزاوية مستقيمة الخطَّين عند الطرف الثابت من الخط المتناهي، فأحد الخطين هو هذا المتناهي مفروضًا على وضع الموازاة، والأخر هو بعينه أيضًا، لكن حال كونه على وضع المسامتة، فكأن هناك خطًّا آخر كان منطبقًا عليه، فزال انطباقه بحركته مع بقاء أحد طرفيـْه على حاله هكذا، [٥و] فيحصل بينه[23] وبين الخطِّ المتحرِّك إلى المسامتة؛ زاويةٌ مستقيمة الخطَّين، وأنَّها تقبل القسمة إلى غير النهاية، إذ قد بيَّن إقليدس أنَّ كلَّ زاوية[٢٤] مستقيمة الخطَّين يمكن تنصيفها بخطٍّ مستقيم، ولا شكَّ أنَّ كلَّ واحد من النصفين زاوية

٢٠ كذا في الأصل، والصواب: لخط غير متناه.

٢١ لعدم انقسام الخط عرضًا وعمقًا، بل طولًا فقط. «منه»

٢٢ انظر: **شرح المواقف** للجرجاني، ٢:٦٣٠

٢٣ أي بين الخطِّ المتناهي حال كونه موازيًا.

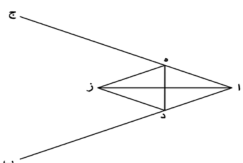
٢٤ ولتكن زاوية «ب ا ج» فلنعين على «ا ب» نقطة وكيف اتفقت، ونفصل من «ا ج» و «ا ه» مثل «ا د» ونصل «د ه» ونرسم

مستقيمة الخطَّين؛ فيقبل التنصيف أيضًا، وهكذا إلى ما لا نهاية له، ولـمَّا فرضنا أنَّ الخطَّ الذي وقعت فيه نقطة المسامتة غير متناه؛ لزم أن تكون المسامتة حاصلة قبلها[٢٥] بنقطة أخرى، **(فيلزم أن لا يكون لها أوَّل، وهو باطل)** لِما عرفت من أنَّ المسامتة حادثة، وكلُّ حادث فله أوَّل.[٢٦]

وهذا المحال إنمّا لزم من كون هذا الخطِّ غير متناه، لأنَّه لو كان متناهيًا كالخطِّ المسامـت له لا تحصل للخطِّ المتحرّك مع الآخر مسامتة، إلا بقدر الخطِّ المتناهي، لا بقدر كلٍّ من انقسامات الزاوية، وهي غير متناهية، **(فعدم تناهي الخطِّ المذكور باطل)** وليس ذلك المحال لازم من انقسام الزاوية إلى غير النهاية، لأنَّه أمر ممكن يقتضيه البرهان القائم على إمكان تنصيفها، والممكن لا يستلزم المحال؛ وإلَّا لكان محالًا، هكذا ينبغي أن يحقق هذا البرهان.

(ونقض هذا البرهان بالخطَّين المتناهيين المتوازيين) بأن يكون البُعد بينهما سواء، إذا انتقل أحدهما **(من التوازي إلى المسامتة وهي آنيُّ الحدوث)** يعني حدوثه في طرف من الزمان، لأنَّ الآن طرف الزمان، كالنقطة بالنسبة إلى الخطِّ، وكونها آنيَّ الحدوث ظاهر لا سترة فيه، **(ولكن لا يوجد آن حدوث المسامتة، فإنَّ كلَّ آن نفرضها فاتصاف الخطِّ بها واقع قبله)** وذلك لجريان خلاصة[٢٧] الدليل المذكور فيه بأن يقال إنَّ انتقال أحد الخطيـْن إلى المسامتة يكون في زمان، وإذا كان حدوث المسامتة في آن ذلك الزمان منطبقًا على الزاوية الحاصلة، مع بقاء خطٍّ متوهَّم في موضع الخطِّ المتحرّك، فيلزم أن يقبل الانقسام إلى ما لا نهاية، ويحصل بعدد كلِّ انقسام آن لحدوث المسامتة، فيلزم أن يكون اتِّصاف الخطِّ المسامتة واقعًا قبل كلِّ آن نفرضه لحدوث المسامتة في آن قبله، فيلزم

عليه مثلث «د ه ز» المتساوي الأضلاع ونصل «ا ز» فهو ينصف الزاوية لأن أضلاع مثلثيْ «ا د ز» «اه ز» المتناظرة متساوية فزاويتا «ز ا د» «ز ا ه» متساويتان وذلك ما أردناه كذا في **تحرير أقليدس**، وهذه صورته:



«منه»

انظر: **أقليدس**، المقالة الأولى، ٩.

٢٥ أو تحصل بعدد كلٍّ من انقساماتها الغير المتناهية مسامتة الخطّ المتحرّك مع الخطّ الغير المتناهي. «منه»

٢٦ انظر: **شرح المواقف** للجرجاني، ٢:٦٣١

٢٧ يعني أنّه من قبيل النقض بجريان خلاصة الدليل في مادَّة النقض مع تخلُّف المدَّعى عنه، لا بجريان عينه، لأنَّ الخطين لـمَّا كانا متناهيين يوجد أوَّل نقطة المسامتة، لكن لا يوجد آن حدوث المسامتة؛ لـما ذكرنا من انقسام الزاوية إلى غير النهاية. «منه»

أن لا يوجد آن أوَّل، وهو باطل لِما عرفت من أنَّه آنيُّ الحدوث، فخلاصة الدليل جار في مادَّة النقض مع تخلّف المدَّعى عنه.

(**وأجيب عنه بمنع كونها**) أي المسامتة، (**آنيَّ الحدوث**) ولـمَّا لم تكن تدريجيًّا بداهة أضرب عنه، فقال: (**بل حدوثها ليس بآنيٍّ ولا تدريجيٍّ؛ بل هو قسم آخر، وستطَّلع على تفاصيل هذا**) في بحث الزمان. هذا المجيب -هو الفاضل اللّاري- قال في بحث الزمان ما حاصله: إنَّ القائم بذات [٥ظ] وجوده إمَّا آنيٌّ، وهو الذي يوجد في آن، وإمَّا تدريجيٌّ، وهو الذي يوجد في آنات بين كلِّ اثنين منها زمان، وإمَّا غيرهما، وهو الذي يوجد في نفس الزمان. فحاصل الجواب منع تخلُّف المدَّعى عن الدليل، يعني لا نسلِّم بطلان عدم وجود آن أوَّل للمسامتة، وإنَّما كان كذلك، لو كان حدوثها آنيًّا، وليس كذلك.

المسلك الثاني في إبطال التسلسل

وفيه فصول أربعة:

الفصل الأول في تحقيق برهان التطبيق

(**وهو العمدة في هذا المطلب، ويجري في الأمور المجتمعة الموجودة المترتِّبة**) ترتُّبًا طبيعيًّا، كما في العلَّة والمعلول، ووضعيًّا، كما في أبعاد المسافة وأجزائها، (**بالاتّفاق بين الحكماء والمتكلِّمين، ويجري في الأمور المرتَّبة مطلقًا، سواء كانت مجتمعةً في الوجود أو متعاقبة**[٢٨] **عند المتكلِّمين**) وقد حقّقه العلّامة الدوّاني في شرح العقائد العضديَّة في بحث الحدوث، بما لا مزيد عليه.

وقال السيد الشريف -قدِّس سرُّه- في شرح المواقف: «يجري هذا البرهان -يعني عند المتكلِّمين- في أمور لا يكون[٢٩] بينها ترتُّب أصلًا، كالنفوس الناطقة المفارقة من الأبدان.»[٣٠]

وقال الشارح الحنفي في شرح إثبات الواجب: «اعلم أن ترتُّب الأمور الغير المتناهية إذا كانت بطريق التصاعد كان التسلسل من جانب العلَّة، وإذا كان بطريق التنزُّل كان من جانب المعلول، فعلى هذا إن كان المعلول مأخوذًا أوّلا، وطلب له علَّة وهكذا؛ فالتسلسل من جانب العلَّة، وإذا

٢٨ كالحركات الفلكية. «منه»

٢٩ بناء على أنَّه لا يحتاج إلى ملاحظة آحادها مفصَّلة؛ بل يكفي ملاحظتها إجمالًا. «منه»

٣٠ انظر: **شرح المواقف** للجرجاني، ١: ٤٢٩.

كانت العلَّة مأخوذة أوَّلًا، وطلب لها معلول وهكذا؛ فهو من جانب المعلول. إذا تقرَّر هذا فنقول: برهان التطبيق بجميع وجوه[٣١] تقريره جار في العلل المتسلسلة إلى غير النهاية، وكذا في المعلولات المتسلسلة إلى غير النهاية، وقد سبق أنَّه جار في الأمور الموجودة الغير المتناهية المترتِّبة وضعًا أيضًا، وهو أشمل البراهين وأقواها في كلِّ ما يُدَّعى تناهيه.» انتهى.[٣٢]

(وتقريره: إنَّه لو تسلسلت العلل إلى غير النهاية، فنفرض من معلول معيَّن بطريق التصاعد سلسلةً غير متناهية، ومن الذي فوقه إلى غير النهاية أيضًا، ثمَّ نطبِّق الجملتين من مبدئها بأن نفرض الأوَّل من الثاني بإزاء الأوَّل من الأولى، والثاني بإزاء الثاني، وهكذا، فإن كان بإزاء كلٍّ من الأولى واحد من الثانية؛ لزم تساوي الجزء والكلِّ، وهو محال، وإن لم يكن، فقد وجد في الأولى جزء لا يوجد بإزائه جزء من الثانية، فيتناهى الناقصة أولًا، ويلزم منه تناهي الزائدة أيضًا، لأنَّ زيادتها بقدر متناه، هو قدر ما بين المبدأين، والزائد على المتناهي بقدر متناه يكون متناهيًا، فيلزم انقطاع السلسلتين، وقد فرضناهما غير متناهيين [و]هذا خلف.[٣٣]

واعترض عليه من وجهين:

الأوَّل: أنَّا لا نسلِّم أنَّ الثانية إن لم ينطبق على تمام الأولى؛ انقطعت، فإنَّه يجوز أن يكون عدم انطباقها عليها لعجزنا عن توهُّم مقابلة أجزائها بأجزائها، لا لكون الأولى أطول من الثانية في جهة عدم التناهي.[34]

وأجيب عنه بأنَّا لا نعني بالتطبيق إلا أنَّ العقل يلاحظ شيئًا بإزاء شيء، ولو على وجه الإجمال، ولا يخفى أنَّ العقل يمكنه أن يلاحظ كلًّا من آحاد إحدى السلسلتين بإزاء واحد من الأخرى على الاتساق، وبذلك يتمُّ الغرض؛ إذ حينئذ لا يخلو إمَّا أن يكون بإزاء كلٍّ من الأولى شيءٌ من الثانية، أو لا، والأوَّل مستلزم للتساوي المحال، والثاني المطلوب.[٣٥]

والثاني: أنَّ هذا البرهان جار في الحوادث اليوميَّة والنفوس الناطقة؛ بل في [٦و] مراتب الأعداد، فيلزم تناهيها بعين الدليل، وهو باطل، وأمَّا بطلان الأوَّلين، فعند الحكماء، وأمّا بطلان الثالث فبداهة.

٣١ وهي الوجوه التي فصَّلها العلَّامة الدوَّاني في إثبات الواجب. «منه»

٣٢ انظر: **الحاشية على شرح إثبات الواجب** لملا الحنفي، ص: ٧٢و.

٣٣ انظر: **رسالة في إثبات الواجب** للدَّواني، ص: ١٣٩.

٣٤ انظر: **رسالة في إثبات الواجب** للدَّواني، ص: ١٥١.

٣٥ انظر: **رسالة في إثبات الواجب** للدَّواني، ص: ١٥٢.

وأجاب المتكلمون عن النقض بالأوَّلين بتسليم جريان البرهان فيهما، ومنع تخلُّف المدَّعى عنه بناء على تناهي النفوس والحوادث عندهم، وعن النقض الثالث بأنَّ مراتب الأعداد موهوم محض؛ إذ لم يضبطها وجود أصلًا) لا خارجًا، ولا ذهنًا، **(فينقطع بانقطاع التوهُّم، فلا يجري فيه التطبيق بخلاف الحوادث اليوميَّة، فإنَّها وإن لم تجتمع في الوجود، فقد ضبطها الوجود الخارجيُّ، فليس موهومًا محضًا.**[٣٦]

وأجاب الحكماء عن الأوَّلين بأنّ التطبيق إنَّما يجري في الأمور الموجودة المجتمعة معًا، المرتَّبة ترتيبًا طبيعيًّا أو وضعيًّا؛ إذ الأمور المعدومة في الخارج مطلقًا؛ لا وجود لآحادها إلَّا في الذهن، ولا يوجد فيه الأمور الغير المتناهية مفصَّلًا، حتَّى يجري فيه التطبيق، والأمور المتعاقبة في الوجود أيضًا كذلك؛ إذ لا وجود للسلسلة الغير المتناهية منها أصلًا، لا في الخارج، ولا في الذهن مفصَّلًا، والمجتمعة الغير المرتَّبة لا يجري فيه التطبيق أيضًا؛ لجواز أن يقع آحاد كثيرة من إحداهما بإزاء واحد من الأخرى، إذ ليس لها نظام حتَّى يستلزم تطبيق المبدأ على المبدأ انطباقَ الباقي على الباقي على الترتيب، فلا بدَّ في التطبيق ههنا) أي في المجتمعة الغير المرتَّبة كعِدَّة من الحصى في كفٍّ؛ **(من أن يلاحظ العقل كلَّ واحد بإزاء واحد، لكنَّ العقل لا يقدر على استحضار ما لا نهاية له مفصَّلًا دفعةً، ولا في زمان متناه، فلا يتصوَّر التطبيق بين السلسلتين بأسرها؛ بل ينقطع بانقطاع الملاحظة.)**[٣٧]

وههنا أبحاث جليلة تجدها في رسالة إثبات الواجب للعلَّامة الدوَّاني، وشرحها للمحقِّق الحنفي، وحاشية المدقِّق ميرزاجان، فلا نطوِّل الكلام بذكرها، لكن نورد منها بحثًا واحدًا: وهو أنَّا لا نسلِّم أنَّ السلسلة الغير المتناهية المتعاقبة في الوجود غير موجودة، غاية الأمر أنَّها غير موجودة في زمان واحد، لكنَّها موجودة في جميع الأزمنة الغير المتعاقبة التي هي أزمنة وجود جزء جزء، وإنَّ الوجود الخارجي قد ضبطها في الأزمنة المتعاقبة الغير المتناهية.

قال الإمام الرازي في المطالب العالية: «استقرَّ رأيي بعد الأفكار المتتالية في مدَّة أربعين سنة متوالية على أنَّ هذا الضبط كافٍ في التطبيق[٣٨] في الأزمنة الغير المتناهية.»[٣٩]

٣٦ انظر: **رسالة في إثبات الواجب** للدَّواني، ص: ١٤٠-١٤١.

٣٧ انظر: **رسالة في إثبات الواجب** للدَّواني، ص: ١٤٢-١٤٣.

٣٨ ولـمَّا كانت مترتِّبة يلزم من تطبيق المبدأ على المبدأ انطباق الباقي على الباقي ولو في أزمنة غير متناهية، فلا يلزم توقُّف إجراء البرهان على وجود منطبقٍ في أزمنة غير متناهية، ولا يلزم عجز الوهم عن التطبيق. «منه»

٣٩ **المطالب العالية** للرازي، ٤:٢٦٤.

(وأجابوا عن الثالث بأنَّ المدَّعى غير متخلِّف، فإنَّ مراتب الأعداد كلَّها متناهية بالفعل، غاية ما في الباب أنَّها لا تقف عند حدٍّ، والكلام في غير المتناهي حقيقة بالفعل، [٦ظ] وبهذا الجواب يندفع النقض بمقدورات الله تعالى أيضًا، لأنَّهم صرَّحوا بأنَّها غير متناهية، بمعنى لا يقف عند حدٍّ، وأمَّا النقض بمعلومات الله التي هي غير متناهية بالفعل، لأنَّ الحوادث الغير المتناهية بمعنى لا يقف عند حدٍّ؛ حاصلةٌ بالفعل في علمه تعالى، فجوابه ما ذكره العلَّامة الدوَّاني من أنـَّه لو كان علم الواجب بالأشياء بصور مفصَّلة، لَكان الأمر كما ذكرت، لكن ذلك ممنوع، لجواز كون علمه تعالى واحدًا بسيطًا، كما ذهب إليه المحقِّقون، فلا تعدُّد في المعلومات بحسب علمه، فلا يتصور التطبيق.) [٤٠]

(واعترض) على هذا البرهان بوجه آخر، وهو أنَّ المحال إنَّما لزم من المجموع، أي من لا تناهي العلل والمعلولات، ومن فصل عدد غير متناهٍ منها حتَّى يحصل جملة أخرى، ومِن توهُّم انطباق أحدهما على الأخرى على الوجه المخصوص، فيكون المجموع محالًا، فلا يلزم من ذلك استحالة شيء من أجزائه، كما أنَّ مجموع قيام زيد وعدمه محال، وكلُّ واحد من جزأيه ممكن في نفسه.

(وأجيب عنه) بأنـَّه إذا كان المجموع محالًا، لا بدَّ أن يكون جزءًا من أجزائه أو اجتماعها محالًا، ونحن نعلم بالضرورة أنَّ ما سوى عدم[٤١] التناهي ليس محالًا، **(وللإمام الرازي إشكال على البرهان، نقله شارح حكمة العين بقوله: «قال: وعلى هذا البرهان إشكال تعسَّر عليَّ حلُّه، وهو أنَّه يجوز امتدادهما، أي الجملتين المفروضتين مع تلك الفضلة)** في إحداهما، **(إلى غير النهاية، ولا يكون الناقص كالزائد.»)** [٤٢]

(وقال شارحه في تقرير هذا الكلام: يعني إن أردتم بلزوم كون الزائد كالناقص على تقدير ذهابها إلى غير النهاية؛ لزومَ عدم تفاضلها عند تقدير التطبيق في تلك الجهة على ذلك التقدير) أي جهة اللّاتناهي على تقدير اللّاتناهي؛ **(فاستحالته ممنوع؛ إذ كلُّ مقدارين لإحداهما في جهة كيفما كانا، أي سواءً كانا ذاهبين من نقطة واحدة إلى غير النهاية أو من نقطتين مختلفتين بالتقدُّم والتأخُّر؛ هما متساويان في تلك الجهة، بمعنى سلب التفاضل عنها في تلك الجهة من غير استحالة، وإن أردتم به لزوم توافي حدَّيها في تلك الجهة على ذلك التقدير، فهو -أي اللزوم- ممنوع.**

والفقه فيه: أنَّ التساوي يقال بالاشتراك على معنيين: أحدهما: هو توافي حدود المقدارين عند التطبيق أو تقديره، وذلك إذا كان لهما حدود، وحال لا تفاضل لهما عند ذلك؛ وثانيهما: هو سلب

٤٠ انظر: **شرح العقائد العضديَّة** للدَّواني، ص: ٤٩.

٤١ وأمّا عدم التناهي فلا نعلم إمكانه ولا استحالته قبل إقامة البرهان، وبعد إقامته علمنا استحالته. «منه»

٤٢ **المباحث المشرقيَّة** للرازي، ١:٣٠٧.

التفاضل [٧و] عنهما في جهة، وذلك إذا لم يكن لهما حدود، فلا يتصوَّر فيهما تفاضل الحدود. وغير التساوي إنَّما يستلزم القلَّة والكثرة أو الصغر والعظم، حتَّى يقال: كلُّ مقدار لا يساوي مقدارًا أخر، فإمَّا أن يكون أقلَّ منه أو أصغر أو أعظم أو أكثر، إذا انتهى أحدهما عند حدٍّ في التطبيق، ولم ينته الآخر عنده؛ بل يتجاوز، فيوصف المنتهي بالقلَّة أو الصغر، وغير المنتهى بالكثرة أو العظم، فإذا حمِل التساوي واللَّاتساوي على المعنيين المتعلِّقين بوجود الحدود؛ لم تكن القسمة إليهما حاصرة؛ بل القسمة الحاصرة بأن يُقال: إما أن يكون للمقادير حدودٌ أو لا، فإن كانت، فهي إما متساوية أو غير متساوية، وإن لم تكن، فذلك قسم[٤٣] آخر غيرهما، وإذ ذاك، فإذا فرضنا التطبيق بين خطَّين محدودين في جهة، وغير محدودين في جهة؛ كان عدم التساوي في تلك الجهة[٤٤]، بالمعنى المتعلِّق بوجود الحدود لا يستلزم قصر أحدهما أو طول الأخر، انتهى.

واعترض عليه السيِّد الشريف -قدِّس سرُّه- في حاشيته بأنَّ الخطَّ الغير المتناهي يمكن تجزئته بأجزاء متساوية، بفرض حدود فيه، كما في الخطِّ المتناهي، غاية ما في الباب أنَّ الحدود والأجزاء في المتناهي متناهية، وفي غير المتناهي غير متناه، وحينئذ يسقط ما ذكِر لوجود الحدود، فعدم التساوي انما يكون لانتفاء التوافي بين الحدود الموجودة، وذلك يستلزم الطول في أحدهما، والقصر في الأخر، ويلزم منه التناهي، فإن مُنع فرض الحدود الغير المتناهية بناء على عجز الوهم، فذلك في الحقيقة عجز الوهم عن توهم الانطباق، وهو ما أشار إليه المصنِّف) وقد سبق جوابه فيما مرَّ.

(وقال الفاضل ميرزاجان: فيه نظر؛ لأنَّ تقسيم غير المتناهي في جهة واحدة[٤٥] فقط إلى أجزاء متساوية محال، مثلًا لا يمكن تنصيفه، ولا تثليثه، ولا تربيعه، وهكذا، والسرُّ فيه أنَّـه إذا فصل من الجانب المتناهي منه شيء في أي مرتَبة كان؛ فما بقي من الجانب الآخر الغير المتناهي غير متناه، وهو لا يساوي[٤٦] المتناهي، نعم يمكن فيه فرض أجزاء متساوية بمعنى لا يقف لا أنّها أجزاء غير متناهية متساوية بالفعل، فتأمّل.

٤٣ أي ليست بمساوية ولا غير مساوية، فبين المساواة واللامساواة تقابل العدم والملكة فيرتفعان عن المقادير الغير المتناهية كالبصر والأعمى، فإنّهما يرتفعان عن الحجر مثلا. «منه»

٤٤ متعلق بالتساوي، والتساوي بهذا المعنى هو التوافق في الحدود، فعدم التساوي المقيد بكونه بهذا المعنى لا ينافي تحقُّق التساوي بمعنى سلب التفاضل، وهو لا يستلزم قصر أحدها وطول الآخر. «منه»

٤٥ بخلاف غير المتناهي في جهتين حيث يجوز تقسيمه إلى أجزاء متساوية؛ لكن بالتنصيف فقط؛ لأنك كلما فصلت منه جزئيين فهما نصفان ألبتة لمساواتهما. «منه»

٤٦ ولا يزيد عليه ولا ينقص عنه، فعدم التساوي فيه لعدم الحدود والأجزاء المتساوية بالفعل؛ لا لانتفاء التوافق بين الحدود الموجودة، فانتفاء التساوي فيه لا يستلزم الطول في أحدهما والقصر في الآخر، فتدبَّر. «منه»

ثم قال السيِّد الشريف قدِّس سرُّه: والظاهر أنَّ مراد الإمام بجواز ذهابها إلى غير النهاية مع تلك الفضلة، هو أنَّ التطبيق الوهمي لاستغراق الخطَّين، ولا يستغرقها بالأسر، بحيث لا يبقى منهما شيء لم يلاحظه الوهم لأجل التطبيق؛ بل كلَّما فرض وصول الوهم في التطبيق إلى حدٍّ، فهناك شيء آخر من الخطَّين يجري فيهما الانطباق، وهكذا الخطَّان الذاهبان، وفي أحدهما تلك الفضلة، والتطبيق لا يقف، [٧ظ] ولا محذور حينئذ، وهذا بالحقيقة عجز الوهم عن التطبيق في جميع أجزاء الخطّين؛ بل هو واقع دائمًا في بعضها، ولا حاجة في توجيه كلامه إلى التطويل الذي لا طائل تحته.

وقال الفاضل ميرزاجان: فيه نظر، أما أوَّلًا: فلما عرفت ممَّا نقلنا عن الإمام، أنَّ في المقادير؛ بل في مطلق ما تحقَّق فيه الترتُّب، سواء كان وضعيًّا أو طبيعيًّا، يحتمل الانطباق الخارجي، ولا يحتاج فيه إلى ملاحظة الوهم أجزاء الخطَّين بالتفصيل حتَّى يقال الوهم عاجز عنه، فهذا الكلام مع أنَّه مخالف للواقع، غير مطابق لما نقلنا عن الإمام أيضًا، فلا يصحُّ توجيه كلامه به.

وأما ثانيًا: فلأنَّ الإمام أورد هذا الإشكال في المباحث المشرقية على وجه لا يمكن حمله على ما ذكِر.[٤٧]

ثم نقل كلامه في المباحث المشرقية بعبارة طويلة، ومن أراده فلينظر حاشية إثبات الواجب للفاضل ميرزاجان.)

الفصل الثاني في تحقيق برهان التضايف

(وتقريره: لو تسلسلت العلل إلى غير النهاية للزم زيادة عدد المعلوليَّة على عدد العليَّة، والتالي باطل.

وبيان الملازَمة: إنَّ آحاد السلسلة، ما خلا المعلول الأخير لها عليِّة ومعلوليَّة، فيتكافؤ عددهما فيها سواه، وبقي معلوليَّة المعلول الأخير زائدًا، فيزيد عدد المعلوليَّات الحاصلة في السلسلة على عدد العليِّات الواقعة فيها بواحد، وأمَّا بطلان اللازم، فلأنَّ المتضايفين تضايفًا حقيقيًّا،[٤٨] كالعلِّيَّة والمعلوليَّة؛ متكافئان في الوجود ضرورة. وهذا البرهان يجري في تسلسل المعلولات أيضًا؛ بل في سائر المتضايفين، كالأبوة والبنوة؛ لكنَّه لا يجري في بعض ما يدَّعى تناهيه، كالبُعد، وكالأمور المترتَّبة وضعًا[٤٩] كالمقادير؛ اللهم إلَّا أن يعتبر فيها التقدُّم والتأخُّر وضعًا، وهما متضايفان.

٤٧ انظر: **الحاشية على شرح إثبات الواجب** للميرزاجان، ص: ١٠٦و-١٠٧و.

٤٨ احتراز عن المتضايفين تضايفًا مشهوريًّا، كالأب والابن، فإنهما ليسا بمتكافئين في الوجود، كأب واحد له أبناء، لكن له أبوة بالنسبة إلى كل واحد من الأبناء. «منه»

٤٩ لكنها أجزاء فرضية، فاعتبار التقدُّم والتأخُّر فيها ينقطع بانقطاع الاعتبار، كذا في حاشية ميرزاجان. «منه»

واعلم أنَّ هذا البرهان ظاهر على تقدير التسلسل في أحد الجانبين فقط، وأمَّا على تقدير التسلسل في الجانبين، فقد يتوَّهم عدم جريانه، لأنَّ العلِّيَّة والمعلوليَّة غير متناهيين، فلا يظهر عدم تكافئهما، وهذا التوَّهم مدفوع، بأنا إذا أخذنا سلسلة غير متناهية من معلول معيَّن وتصاعدنا في عِلله الغير المتناهية، فلا بدَّ أن يكون عدد العلِّيَّات والمعلوليَّات الواقعة في هذه القطعة الغير المتناهية متكافئة، ضرورةَ أن العلِّيَّات التي تضايف المعلوليَّات الواقعة فيها، لا يمكن أن يكون فيها تحت تلك القطعة من المعلوليَّات، وذلك لأن المعلوليَّة إنَّما تضايف العلِّيَّة الواقعة قبل المعلول المتَّصف بالمعلوليَّة، لا العلِّيَّة الواقعة فيه، ولا العلِّيَّة الواقعة بعده.[٥٠]

فإذا أخذنا[٥١] معلولًا معيَّنًا، وتصاعدنا في علله الغير المتناهية، يكون عدد المعلوليَّات زائدًا على عدد العلِّيَّات بواحد، وهو باطل، وكذا إذا أخذنا علَّة معيَّنة و[٨و] تنزَّلنا في المعلولات الغير المتناهية، يكون عدد العلِّيَّات زائدًا على عدد المعلوليَّات بواحد، وهو باطل أيضًا، فيلزم انتهاء السلسلة من الجانبين، وهو مطلوب.[٥٢]

وأورد على هذا البرهان النقض بالأمور الغير المتناهية المترَّتِّبة المتعاقبة، كحركات الأفلاك والأزمنة، فإنَّ كلَّ واحد منها معلول لِما قبله ومتأخِّر عنه، وكما أنَّ العلِّيَّة والمعلوليَّة متضايفان، كذلك التقدُّم والتأخُّر، فيجري فيها البرهان مع تخلُّف المدَّعى عنه، وكذا يجري في الأمور الغير المتناهية الموجودة المجتمعة المترتِّبة باعتبار[٥٣] أزمنة حدوثها،[٥٤] كالنفوس الناطقة البشرية على رأيهم مع تخلُّف المدَّعى عنه على رأي الحكماء. فهذا البرهان منقوض على رأيهم.

وأجيب عن الأوَّل بأنَّ أجزاء الحركات والأزمنة المنطبقة عليها فرضية، لا يحصل شيء بالفعل؛ إلا بفرض العقل واعتباره، فينقطع بانقطاع الاعتبار.) حاصل هذا الجواب أنَّ أجزاء الحركة فرضية؛ إذ ليس ههنا إلَّا حركة واحدة، وكذا الزمان متَّصل واحد منطبق عليها، والذي يوجد بالفعل الفرضي كان متناهيًا، فلا يجري هذا البرهان بالنظر إلى أجزائها في نفس الأمر؛ إذ ليس لهما أجزاء

٥٠ انظر: **رسالة في إثبات الواجب** للدَّواني، ص: ١٥٧–١٥٨.

٥١ يعني أن الملحوظ في البرهان إنما هو إبطال التسلسل من جانب واحد، لكن تارة يعتبر جانب المعلول وتارة جانب العلل، فينتهي التسلسل من الجانبين. «منه»

٥٢ انظر: **شرح العقائد العضديَّة** للدَّواني، ص: ٤١–٤٢.

٥٣ وأيضا نفس الأب يتوقَّف على بدنه المتوقف على نفس الأب المولِّدة لمادة بدنه، ففيها ترتُّب ذاتي. «منه»

٥٤ فإن نفس زيد حادث وقت حدوث بدنه فيكون مقدَّما على نفس عمرو الذي حدث بعده، وهكذا فبعضها مقدَّم على بعض الآخر بالزمان، وهو نوع من الترتُّب. «منه»

في نفس الأمر، ويجري بالنظر إلى أجزائهما الفرضية، لكن المدَّعى غير متخلّف عن الدليل حينئذ؛ لأنَّ أجزاءها الفرضية منقطعة بانقطاع الفرض والاعتبار.

(وأجيب عن الثاني بأنَّه إنَّما يرد على بعض الحكماء، القائلين بحدوث النفس الناطقة بحدوث الأبدان، وأمَّا من قال بقدمها، فلا يلزم هذا.

وأورد على هذا البرهان أيضًا النقض على كلا الرأيين) أعني رأي الحكماء والمتكلِّمين، **(بمراتب الأعداد الغير المتناهية الموجودة مفصَّلًا في الملأ الأعلى،[٥٥] وموجودة في نفس الأمر، فيجري هذا البرهان فيها مع تخلُّف المدَّعى عنه.**

وأجيب بأنَّ علم الملأ الأعلى على نحو الإجمال عندهم، فالصور الغير المتناهية متَّحدة بحسب العلم الإجمالي، وغير متكثِّرة، فلا يجري فيها البرهان بحسب هذا العلم.)

واعلم أنَّه أُورد على هذا البرهان أنَّه إن أريد أنَّه يزيد عدد المعلوليَّة على عدد العلِّيَّة بحسب نفس الأمر، فهو ممنوع، إنَّما تتأتَّى هذه الدَّعوى لو كان للصفتين وجود في الواقع، والواقع أنَّه ليس كذلك؛ لكونها صفتين اعتباريَّتين انتزاعيَّتين، كما حقِّق في محله، وإن أريد أنَّه يزيد عدد المعلوليَّة على عدد العلِّيَّة بعد اعتبار العقل إياهما، وانتزاعهما من هذه الآحاد، فالعقل لا ينتزع جميع تلك العلِّيَّات والمعلوليَّات، حتى يلزم المحذور المذكور.

وأجاب عنه المحقِّق ميرزاجان بأن العلِّيَّة المعلوليَّة موجودة في نفس الأمر؛ بل في الخارج على ما هو المشهور من مذهب الحكماء، القائلين بوجود الإضافات في الخارج، ومجرَّد وجود ذهابه في نفس الأمر يكفي لجريان الدليل، وليست اعتبارية محضة حتَّى لا يتحقَّق إلا باعتبار العقل.[٥٦]

ثم قال: وفيه تأمُّل؛ لأنَّ وجودها في نفس الأمر لا يلزم أن يكون على نحو التفصيل؛ بل يجوز [٨ظ] أن يكون وجودها في بعض المدارك العالية على نحو الإجمال، فلا يحصل علِّيَّات ومعلوليَّات غير متناهية بالفعل، **ثم قال:** فتأمَّل جدًّا.[٥٧]

وأقول: لعلَّ وجه التأمُّل أنَّ الملاحظة الإجماليَّة كافية لانتزاعهما إجمالًا، وهذا القدر كاف في إجراء البرهان، وإثبات التناهي؛ إذ العقل يحكم بداهةً باستحالة زيادة عدد أحد المتضايفين على الآخر، والله أعلم.

٥٥ وهو الواجب تعالى فقط عند المتكلمين، والعقول أيضا عند الحكماء. «منه»

٥٦ انظر: **الحاشية على شرح إثبات الواجب** للميرزاجان، ص: ١١١ظ.

٥٧ انظر: **الحاشية على شرح إثبات الواجب** للميرزاجان، ص: ١١١ظ.

الفصل الثالث في تحقيق البرهان العرشيِّ

قيل: استخرجه الشيخ شهاب الدين يحيى المقتول، وسمِّي بالبرهان العرشيِّ لكونه مناسبًا لمُستخرجه، وقيل: إنَّه كالعرش في أنَّه لا يصل إليه –لدقته– إلا صاحب القوَّة القدسيَّة.

(وتقريره أن يقال: لو ترتَّب أمور غير متناهية، كان ما بين مبدئها وكلِّ واحد ممَّا قبله متناهيًا، لأنَّه محصور بين حاصرين، فيكون الكلُّ متناهيًا، لأنَّ الكلَّ لا يزيد على ما بين المبدأ وكلِّ واحد إلا بالطرفين.

واعترض عليه بأنَّـه لا يلزم من تناهي كلِّ واحد من أجزاء السلسلة الواقعة بين المبدأ وبين كل واحد؛ تناهي السلسلة بأسرها، فإنَّ هذا الحكم من قبيل أن يقال: ما بين «ا» و«ب» أقلُّ من ذراع، وكذا ما بين «ب» و «ج» أقلُّ منه، فيلزم على تقدير صحَّة ما ذكِر أن يكون ما بين «ا» و «ج» أقلُّ منه، وإنَّـه غير صحيح.

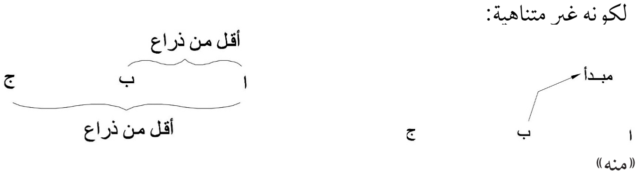
وأجيب عنه بأنَّه ليس من هذا القبيل؛ لأنَّ المبدأ في السلسلة الغير المتناهية المفروضة واحد،[٥٨] بخلافه في المثال؛ بل من قبيل أن يقال ما بين «ا» و «ب» أقلُّ من ذراع، وكذلك ما بين «ب» و «ج»، فإنَّه حينئذ يلزم منه أنَّـه إذا أخذ «ج» مع الواقع بينه وبين «ا» لم يزد على أقلِّ من ذراع إلَّا بالطرف الآخر، وهو طرف «ج»، فيكون محصورًا بين حاصرين، فيكون متناهيًا، وفيه نظر؛ لأنَّ الحكم في هذه الصورة بيِّـن) لأنَّه من قبيل ضمِّ مقدار معيَّن إلى مقدار معيَّن مع تناهيهما، **(بخلاف الصورة المبحوث عنها؛ إذ لا يلزم من تناهي كلِّ جزء من الأجزاء الواقعة بين الطرفين، تناهي الكلِّ؛ لكونه غير واقع بين الطرفين أصلًا.)**

وقيل في جوابه: إنَّ هذا البرهان حَدْسِيٌّ، وصاحب القوَّة القدسيَّة يعلم أنَّ هناك واحدة من العلل، هي مع المبدأ يحيطان بها عداهما، وإن لم يتعيَّن تلك الواحدة عنده، ولم يمكن له الإشارة إليه على التعيين.

ولا يخفى عليك ضعف هذا الجواب، إذ حينئذ لا يكون حجَّة على الغير، على أنَّـه يرد عليه أنَّ وجوب توسُّط الكلِّ بين المبدأ وبين الواحد ليس أجلى من [٩و] المطلوب، حتَّى يثبت به أو ينبه بوجه عليه؛ بل يكاد أن يكون عينه، إذ لا معنى للانتهاء إلا إحاطة النهاية به.[٥٩]

وأيضًا هذا البرهان منقوض بالأمور التي نقِض بها برهان التضايف، وبالجملة هذا البرهان في غاية الضعف.

٥٨ لكونه غير متناهية:



٥٩ انظر: **رسالة في إثبات الواجب** للدَّواني، ص: ١٥٩–١٦١.

الفصل الرابع في تحقيق البرهانين اللذين نقلهما الفاضل ميرزاجان وأسندهما إلى بعض فضلاء زمانه

(الأول: أنَّه إذا ترتَّب العلل إلى غير النهاية مثلا، فلا يخلو إما أن يكون عدد آحادها زوجًا أو فردًا، وعلى الثاني، نسقط منها واحدًا، والباقي يكون زوجًا لا محالة، وعلى التقديرين كان له نصف، إذ لا معنى للزوج إلا ما ينقسم إلى متساويين كان كلٌّ منهما نصفه، ثم نقول النصف الذي وقع في جانب المتناهي؛ لا بدَّ أن يكون متناهيًا، ضرورةَ انحصاره بين المبدأ وبين المنتصف، ويلزم من تناهيه تناهي كلِّه؛ لأنَّ ضعف المتناهي يكون متناهيًا لا محالة.

وأورد عليه أنَّ غير المتناهي من طرف واحد[٦٠] لا يقبل التنصيف، ولا التربيع، ولا ينقسم إلى أقسام متساوية مطلقًا؛ لأنَّه كلَّما انفصل منه شيء، كان الباقي غير متناه، ولا نسبة بين المتناهي الذي انفصل عنه وبين ما بقي منه، وأمَّا أنَّ كلَّ عدد لا بدَّ أن يكون زوجًا أو فردًا، فذلك إنما هو في الأعداد المتناهية.[٦١]

قيل: اللهمَّ إلَّا أن يلزم أنَّ غير المتناهي داخل في الفرد، وبعد هذا الإلزام لا يتمُّ البرهان أيضًا، لأنَّ غير المتناهي وإن كان فردًا؛ ولكنَّه فرد بمعنى أنَّه ليس شأنه أن ينقسم بمتساويين، وحينئذ لا يكون زوجًا بمعنى أنَّه ينقسم بمتساويين إذا أسقط منه واحد، كما يعرف بالتأمُّل الصادق.[٦٢]

الثاني: أنَّه لو وجدت سلسلة غير متناهية، كان بين الواحد من تلك الآحاد ومجموعها مجموعات غير متناهية مترتِّبة؛ كان بعضها جزءًا من بعض، مثلا الواحد جزء الإثنين، وهو جزءٌ للثلاثة وهكذا، فيلزم انحصار ما لا يتناهى وكان مترتبة الأجزاء محصورًا بين حاصرين.[٦٣]

وأورد عليه أنَّا لا نسلِّم أنَّ بعض تلك المجموعات جزء من بعض؛ بل كلُّ واحد منها جزء للجملة؛ بل كلُّ واحد من تلك الآحاد جزء لنفس الجملة المفروضة على ما عرفتَ نظيره في العدد، فإنه مركَّب من الوِحدات، لا من أعداد تحته، فكذا الحال في المعدودات.)[٦٤]

وأيضًا يرد عليه ما أورد على البرهان العرشيِّ من أن اللّازم إنَّما هو تناهي الأجزاء، لا تناهي الكلِّ، لأنَّه ليس محصورًا بين الحاصرين.

(وليكن هذا آخر الرسالة الجامعة لأساس البراهين وأسئلَتِها وأجوبتها.)

٦٠ فيه إشارة إلى أن هذا البرهان يعمُّ في غير المتناهي من الطرفين. «منه»

٦١ فإن الظاهر أن يكون بينهما تقابل العدم والملكة، لا تقابل السلب والإيجاب. «منه»

٦٢ انظر: **الحاشية على شرح إثبات الواجب** للميرزاجان، ص: ١١١ظ-١١٢و.

٦٣ كذا في الأصل.

٦٤ انظر: **الحاشية على شرح إثبات الواجب** للميرزاجان، ص: ١١٢و.

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