# Touching the Point: Mu'ayyadzāda 'Abd Al-Raḥmān Efendi's Treatise on *Juz' Alladhī Lā Yatajazza'*: An Analysis, Critical Edition, and Translation[*]

Osman Demir[**]

Mehmet Arıkan[***]

**Abstract:** This article provides the analysis, translation, and critical edition (*taḥqīq*) of Mu'ayyadzāda 'Abd al-Raḥmān Efendi's (d. 922/1516) treatise on *al-juz' alladhī lā yatajazza'* (*Treatise on the indivisible part*), which is important in the debates of atomism in the history of Islam. If the subject and the method of the *risāla* is taken into consideration, one can regard it as a continuation of the tradition of the *Sharḥ al-Mawāqif* glosses. After a brief discussion in the article's introduction related to the importance of the work and its topic, the copies of the manuscripts that contributed to this critical edition process, as well as the *risāla*'s ownership, will be presented. The section on content analysis is divided mainly into three parts. The first one (a) summarizes the problem of contiguity (*tamāss*) faced by the author to inform the readers of its background. The following sections that focuses directly on the *risāla*'s content is (b) an overview of the eighty geometrical proofs set by the author to cancel the idea of contiguity's survival in time (*baqā' al-tamāss*) in the Avicennian concept, and (c) focusing on the "well-known doubt" (*al-shubhat al-mashhūra*), which examines the time-instant relationship in the context of how the sphere touches the surface. The article's analytical section ends with the conclusion and the bibliography, including the critical edition, based upon the four copies of the *risāla* and its translation.

**Key Words:** Mu'ayyadzāda 'Abd al-Raḥmān Efendi, Atomism, Hylomorphism, Theology, Islamic Philosophy, Ottoman Intellectual Thought, Problem of Contiguity, Time and Instant Relationship.

[**] Assoc. Prof. Ankara Hacı Bayram Veli University Polatlı Divinity Faculty & University of Bonn, Alexander von Humboldt Kolleg for Intellectual History. Correspondence: demirosman1974@gmail.com

[***] Res. Assist., İstanbul Medeniyet University, Department of History of Sciences.Correspondence: mehmet280@gmail.com

## Introduction

Beginning from the first period before al-Ghazālī, the *mutakallimūn*'s understanding of nature was largely represented by the theory of *al-jawhar al-fard* (single atom). Accordingly, the universe consists of parts (*juz' alladhī lā yatajazza'*) that cannot be divided and attributes (*a'rāḍ*) inhered on them, and the association of these things forms the body and the material world. These similar, non-renewable, and homogenous parts, none of which have a mental existence, have an assumed place (*ḥayyiz*), surfaces, and volumes (*masāḥa*), although they have no dimensions and primary qualities. One part joins the other parts to form the line, the lines are combined to form the surface, and the overlapping of the two surfaces forms a finite and limited body divided in terms of length, width, and depth. In this respect, it is assumed that physical elements such as time, space, movement, distance, and direction come together at the conjunction of the parts. These parts are, first and foremost, created by the direct creation of a God from nothing, but also continue to exist by His constant creation of the matter contained in a substance. At this time, the *mutakallimūn* did not solve just the problems that emerged while struggling with dualist and materialist trends and then with the philosophers in the framework of the relationship of God-universe, but they also explained many of the creedal subjects, including prophethood, human deeds, and corporeal resurrection in the afterlife, in a way that was compatible with the views of revelation.[1]

By the end of the first period, the interest in the theory of *al-jawhar al-fard* seems to have lost its influence; however, a new atomist model was built during the period that began with Fakhr al-Dīn al-Rāzī (d. 606/1210). In this new model, the concept of the part, which was at the core of the theory, also underwent a certain transformation. The idea of representing the part by a geometrical point, which had been the case during the first period, was now supported by philosophical knowledge and ontology and became a part of the search for existence. This theory was further fortified by assimilating some of the features of the theory of matter and form. While the issues related to theoretical physics were discussed in detail within the *jawhar* and *a'rāḍ* chapters, the science of kalām strengthened its scientific identity even further. The adoption of results and debates that emerged

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1   Alnoor Dhanani, *The Physical Theory of Kalām: Atoms, Space and Void in Basrian Muʿtazilī Theology* (Leiden: Brill, 1994). Munā Aḥmad Muḥammad Abū Zayd, *al-Tasawwur al-Dharrī fī al-Fikr al-Falsafī al-Islāmī* (Beirut: al-Muʾassasāt al-Jāmiʿiyya, 1994). Mehmet Bulğen, *Kelam Atomculuğu ve Modern Kozmoloji* (Ankara: Türkiye Diyanet Vakfı, 2015). Shlomo Pines, *İslâm Atomculuğu*, trans. Osman Demir (Istanbul: Klasik Yayınları, 2017).

with al-Rāzī's philosophical criticism of the period's important names underwent different conceptual transformations and problems during this process.[2] As a result, independent treatises were written in order to solve the new problems that arose. Therefore, this treatise should be seen as a continuation of that process.

*Sharḥ al-Mawāqif* is one of the strongest opuses that contains theoretical physics among the kalām works. Its matters were subjected to various glossaries afterward. Even though the super-commentators (*muhashshī*) were more likely to concentrate on the chapter of general matters (*al-umūr al-ʿāmma*), some of the points in the *jawhar* and *aʿrāḍ* chapters were also interesting. Therefore, some works contained mutual subjects, concepts, and references. The topics were examined discursively in voluminous works in the chapter on physics, after which scrutinized independent articles and problems began to crystallize gradually. Muʾayyadzāda's (d. 922/1516)[3] treatise, which we are analyzing here, is a critical edition, translation and analyze is a part of the literature devoted to the studies of atomism, taking into account the methodology and the frame of its reference. An author begins treatise with a quotation from *al-Mawāqif*, investigates the proof of contiguity that the *mutakallimūn* and *falāsifa* used to prove their own theories and the extended engaged issues such as time, space and distant in a structure both propose to overcome the existing problems and moving from the historical accumulation.[4]

2   Al-Ījī's definition of body can be given an example of that transformation: "The object is an entity consisting of *al-jawhar al-fard*, which has space and dimension and also accepts the division." ʿAḍūd al-Dīn al-Ījī, *Kitāb al-Mawāqif* (with *Sharḥ al-Mawāqif*) ed. ʿAbd al-Raḥmān ʿUmayra, 1-3 (Beirut: Dār al-Jīl, 1417/1997), 2, 315. Also see Osman Demir, "Îcî Kelâmında Fizik", *İslâm İlim ve Fikir Geleneğinde Adudüddin el-Îcî*, ed. Eşref Altaş (Istanbul: İSAM Yayınları 2017), 333-84.

3   To obtain general knowledge about Muʾayyadzāda's life, Taşköprīzāde Aḥmad Efendi, *al-Shaqāʾiq al-Nuʿmāniyya fī ʿUlamāʾ al-Dawlat al-ʿUthmāniyya* (Beirut: Dār al-Kitāb al-ʿArabī, 1395/1975), 176-79. Mahmūd b. Sulaymān al-Kafawī, *Katāʾibu Aʿlām al-Ahyār min Fuqahāʾi Madhhab al-Nuʿmān al-Mukhtār*, ed. Saffet Köse, Murat Şimşek, Hasan Özer, Huzeyfe Çeker, and Güneş Öztürk (Istanbul: Maktabat al-Irshād, 1438/2017), 4, 419-24. İsmail Hakkı Uzunçarşılı, *Osmanlı Tarihi* (Ankara: Türk Tarih Kurumu Basımevi, 1949), 2, 657-60. M. Tayyib Gökbilgin, "Müeyyed-zâde", *İA*, 8, 786-90. Hasan Aksoy, "Müeyyedzâde Abdurrahman Efendi," *DİA*, 31, 485-86. Ahmet İnanır, "Müeyyedzâde Abdurrahman Efendi'nin Hayatı ve Osmanlı Hukuk Geleneğindeki Yeri," *Uluslararası Amasya Âlimleri Sempozyumu Bildiriler Kitabı*, ed. Şuayip Özdemir and Ayşegül Gün (Ankara: Amasya Üniversitesi İlahiyat Fakültesi, 2017), 1, 339-47.

4   Muʾayyadzāda wrote three *Ḥāshiya* on *Sharḥ al-Mawāqif*. The first one is dedicated to Bayezid II, namely, *Hâshiya ʿalā Sharḥ al-Mawāqif*. A master thesis was completed on this treatise, which deals with the divine attributes. See Moulay el-Hassen el-Hafīdī, "Müeyyedzâde b. Ali'nin el-Havâşî alâ Şerhi'l-Mevâkıf Adlı Eserinin Kelamdaki Önemi" (Master's thesis, Çanakkale Onsekiz Mart Üniversitesi, 2014). The brief information will be given forward in the footnote 41 about the second treatise which is discussing the problem of *shubhat al-ʿammā*. It will be published within the framework of a project that is currently underway. See Osman Demir, "Tracing the School of al-Dawānī in Ottoman Lands: Muʾayyadzāde ʿAbd al-Raḥmān's Natural Theology in Comparison with His Master Jalāl al-Dīn al al-Dawānī," University

## A. The Text: Can we really refer to two different treatises for Muʾayyadzāda?

In his *Kashf al-ẓunūn*, one of the classical bibliographical sources, Kātib Çelebi (d. 1067/1657) mentions two works of Muʾayyadzāda that coincide with the subject of the treatise being discussed here: the *"Risālatun fī-l-juzʾ alladhī lā yatajazza"*[5] and the *"Risālatun fī-l-kurat al-mudaḥraja,"* respectively.[6] Kātib Çelebi provided no additional explanation on the first one, but he did provide extra sentences for the second: "There [in this treatise], he has collected strange books, some of which none of his contemporaries ever heard of [i.e., that were unknown to them], let alone grasped." (وقد جمع فيها غرائب من الكتب وفيها كتب لم يسمع بها أحد من أبناء الزمان فضلاً عن الاطلاع عليها) Yet when we examine the text we have published as a critical edition, we detect that the treatise is not as indicated by Kātib Çelebi, and does not contain excerpts from the books that were unknown in his time. In this case, it is probable that Muʾayyadzāda might have authored another treatise in which he discussed the subject of "rolling sphere."

However, when we inspect the information on Muʾayyadzāda given by Taşköprīzāde Aḥmad Efendi (d. 968/1561) in his biographical dictionary *al-Shaqaʾiq al-nuʿmāniyya*, the source of the problem becomes clear. At the end of the chapter he devotes to Muʾayyadzāda, he gives information about the latter's works and shares some of his comments. The last work that Taşköprīzāde mentions is a treatise entitled *Risālatun fī taḥqīq al-kurat al-mudaḥraja*. After mentioning its name, he wrote on the books collected by Muʾayyadzāda and the library he created: "He [Muʾayyadzāda] has collected strange books, some of which none of his contemporaries had ever heard of, let alone grasped. I heard that his library consisted of seven thousand volumes, except for the duplicated ones."[7] Therefore, it appears that Kātib Çelebi's information on the second treatise was caused by a mistake in the manuscript he consulted as a source, or by a misunderstanding due to his own negligence.

5    Kātib Çelebi, *Kashf al-ẓunūn ʿan asāmī al-kutub wa-l-funūn*, ed. M. Şerefettin Yaltkaya (Ankara: Milli Eğitim Bakanlığı, 1941), I, 857.

6    Ibid., I, 886.

7    Taşköprīzāde, *al-Shaqāʾiq*, 179.

Besides, the sources of the period such as Maḥmūd al-Kafawī (d. 990/1582)[8] and Taşköprīzāde refer to Muʾayyadzāda as having written "a treatise on the rolling sphere," but do not mention any work by him on "the indivisible part." In one of the manuscripts we have received (i.e., the fifth copy), the treatise was named "*Risāla-i Kura-i Mudaḥraja*." As can be understood from the author's expressions, one can conclude that the major text of our subject is a [long] gloss written on the topic of "the indivisible part" in *Sharḥ al-Mawāqif* that some scholars refer to as "The indivisible part" and others as "The rolling sphere."

So far, our research has located eight copies of this work. First of all, the copyists must have experienced great difficulty because the topic is a delicate subject that touches many disciplines and because the use of similar expressions / interpretations is very common. This situation causes a lot of errors in manuscripts and greatly reduces the number of copies that can be considered when preparing the text's critical edition. We mention them here in terms of how important they were to preparing the critical edition.

1. Süleymaniye Library, Carullah Efendi Section, MS 1341, 108b-113b. This is a collection of glosses written mostly on *Sharḥ al-Mawāqif*. Muʾayyadzāda's glosses on the subjects of "Juzʾun lā yatajazzaʾ" and "al-shubhat al-ʿāmma" were copied in a consecutive manner. According to the colophon of the "al-shubhat al-ʿāmma" treatise, the copying of the treatises was completed at the end of Dhū al-qaʿda 901 (i.e., August 1494). Due to the fact that it is both the oldest and contains the fewest errors, this copy is accepted as the most reliable one and is indicated by the letter ح.

2. Süleymaniye Library, Fatih Section MS 5414, 31b-38b. The fourth treatise of this collection, which is composed of eight small or large pieces, is the "juzʾun lā yatajazzaʾ" that we have considered as a source for our criticaledition. The expressions on the flyleaf (*wiqāya* page), on the manuscript's first page (*ẓahriyya page*), and on the treatise's first page (31b) indicate that this manuscript clearly belongs to Muʾayyadzāda. Even though the date of copying is not clear, it is a faithful / reliable copy. Therefore, we used it and denoted it by the letter ح.

3. Escorial Library, Ms. Árabe 236. Three glosses of Muʾayyadzāda on the *Mawāqif* are consecutively located between the pages of 69b and 100b. On both the manuscript's opening page (1a) and the page where the relevant glosses begin

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8    Al-Kafawī, *Katāʾib*, IV, 419.

(69a), the relationshipof the treatises to Mu'ayyadzāda was clearly stated. According to the data given on page 69a, the glosses were copied from the author's autograph manuscript and passed thorugh the *muqābala* (collation) process. But despite this positive statement, it contains more errors than the [first] copy, which serves as the basis of our critical edition. In addition, the expression "sallamahū Allāh," which appears in the *"minhu"* records on the margin, suggests that the copy was written while the author was alive. However, no data is given about the date of copying. The section "juz'un lā yatajazza'," the subject of our critical edition, is located between pages 85a and 93b in the MS and indicated by the letter ل.

4.  Süleymaniye Library, Şehid Ali Paşa Section, MS 2829, 31a-33b. Since the title "Ajwibat al-ʿIdhārī" was written at the beginning of the treatise, this work was attributed to Molla ʿIdhārī (d. 901/1496) in the catalog records. On the other hand, this work seems to be confused with Molla ʿIdhārī's answers to the treatise of *al-Sabʿ al-shidād* written by Molla Luṭfī (d. 900/1495), which comes immediately after the first. Finally, on a different line, the accurate record / name was added to the beginning of the original *Ajwiba*. Considering the mistakes in this copy, which has no date of copying, it is understood that it was in the same branch with the copy of Carullah MS 1341. For these reasons, we did not consider it as a source for our critical edition.

5.  Süleymaniye Library, Süleymaniye Section, MS 1049, 52a-57a. Although the date of copying (947/1540-41) and the name of copyist (Pīr Aḥmad Rāhī) are certain, we did not consider this copy as a source for our critical edition because of the problematic issues in its text. On the treatise's opening page (52a) is the title "Risāla-i kura-i mudaḥraja."

6.  Köprülü Library, Fazıl Ahmed Paşa Section MS 1596, 169a-177b. The same collection contains the treatise written by Mu'ayyadzāda on the subject "al-Shubhat al-ʿāmma." This copy is indicated in our critical edition by the letter ك.

7.  Beyazıt Manuscript Library, Veliyüddin Efendi Section, MS 3263, 177b-183a. It is stated in the colophon that this treatise belongs to Mu'ayyadzāda and that its copying was completed on Ramadan 4, 941 (March 9, 1535. Because it is an extremely problematic copy, we did not consider it as a source for our critical edition.

8.  Bursa İnebey Manuscript Library, Hüseyin Çelebi Section, MS 629. The treatise is located between pages 21b and 27b of this collection.

## B. Content

### 1. The Problem of Contiguity in Kalām

According to the *mutakallimūn* who defend the theory that the body is made of atoms, those pieces that have eternal existence must come together to form a material object and the physical world. Otherwise, the composition of a three-dimensional concrete body and a world made up by these elements from dimensionless, non-extended, and homogenous pieces would be impossible. Thus, an object's existence was first explained by carrying of the parts that were firstly identified by the point but then coincided with it to the accident of combination (*ta'līf*) It was also assumed that this combination formed no integral integrity but that it was, in a discrete manner, in line with the axioms of discontinuity geometry. Thus, the combination of a body that has width, length, and height from the dimensionless part, explained in first place; and then the problem of space and continuity caused by atomic physics, the atom, and environment relationship; and finally the phenomenon of diversity in objects and many issues concerned with the direction, extension, volume, quantity, and quiddity were analyzed and found to be compatible with theological acceptance.[9]

There is no apparent difference between words such as *ta'līf*, *i'tilāf*, *tamāss*, *mumāssa*, *tarkīb*, *mujāwara*, *ijtimā'*, *inḍimām*, and *mulāqāt* in the early sources. However, when defining the body, it was preferable to use *ta'līf* and *i'tilāf* in order to explain the combination of parts. In this respect, they took precaution as regards the possibility of infinite division by defining "combination" as the absence of one part between two other parts, and assumed that a place or a vacuum was occupied by the middle part. If the parts were combined in a way that allowed no gaps between them, then there were cases such as adjacent, adhesion, contiguity, and combination. It is also stated that without the contribution of this accident, the object's separation (*tafrīq*) would not be in question.[10] In this context, all of the

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9    For an overview of the combination-contiguity debate during the first period, see Pines, *İslâm Atomculuğu*, 17-20.

10   For a description of the attribute of combination in the science of kalām, see al-Juwaynī, *al-Shāmil fī Usūl al-Dīn*, ed. 'Alī Sāmi al-Nashshār, Suhayr Muḥammad Mukhtār, Fā'iz al-Badr 'Awn (Alexandria: Munsha'āt al-Ma'ārif, 1969); Ibn Mattawayh, *al-Tadhkira fī Aḥkām al-Jawāhir wa-l-A'rāḍ*, ed. Daniel Gimaret (Cairo: Ma'had al-'Ilm al-Faransī, 2009), 1, 289-90; al-Taftāzānī, *Sharḥ al-Maqāṣid* (Beirut: 'Ālām al-Kutub, 1998), 3, 10-11; al-Ījī, *al-Mawāqif*, 2, 205-14; Kâdî Abdülcebbâr, *Nedensellik Kitabı: Kitâbü't-Tevlîd min Kitâbi'l-Muğnî*, tran. Osman Demir (Istanbul: Klasik Yayınları, 2015), 108. For Ibn Sīnā's usage of "combination" and "separation of the body" to refute an atom, see Ibn Sīnā, *Kitāb al-*

following issues focused on details: the number of the combinations' attributes that constitute the finite object, the combination's need for a second part or place, the combinations' homogeneous nature and its oppositeness, the combinations' types and conditions, the combination's location in the body, *ta'līf*'s effects on the body's characteristics (especially in terms of its volume and shape), the part's status before the combination, *ta'līf*'s solution to the problem of interpenetration (*tadākhul*), the casual relationship between adjacent and *ta'līf* and, more particularly, the troubles caused by the middle part assumed by the conjunction of two parts.[11]

Al-Naẓẓām's (d. 231/845) investigations allowed *mutakallimūn* to review contradictory aspects of their allegations concerning the defenders of an indivisible part in the early period and thus to deelop a more coherent theory. In this respect, the logical and philosophical evidence from the Greek sources was used to prove the part as well as answer the opposing allegations. This situation, first identified in the debate between Abū al-Hudhayl (d. 235/849-50 [?]) and al-Naẓẓām, created important chapters in the works of the *muta'ākhirūn* period, and the secondary topics discussed during the first period began to be examined in independent treatises. In this context, contiguity, one of the strongest pieces of evidence of the *al-jawhar al-fard*, was verified by arguments both for and against. In the first period, the concept of *tamāss* (or *mumāssa*) was used mostly to express a combination of parts; however, it later became an important proposition of the body's definition,

    *Shifā', al-Ṭabīʿiyyāt I: al-Simâ' al-Ṭabīʿī*, ed. Said Zāyed (Qum: Menshūrāt Āyatallāh al-Uzmā al-Marʿashī al-Najʿī, 1409), 185.

11    For the part required for combination and its location, see al-Ashʿarī, *Maqālāt al-Islâmiyyīn wa-l-Ikhtilāf al-Muṣallīn,* ed. Hellmut Ritter (Wiesbaden: Franz Steiner Verlag, 1963), 302-03, 317; Ibn Mattawayh, *al-Tadhkira*, 1, 71-74; Ibn Fūrak, *Mujarrad Maqālāt al-Sheikh Abu al-Ḥasan al-Ashʿarī*, ed. Daniel Gimaret (Beirut: Dār al-Mashriq, 1987), 212-13. For the issue of the middle part between two parts in contact, see Ibn Ḥazm, *al-Faṣl fi-l-Milal wa-l-Ahwā' wa-l-Niḥal*, ed. ʿAbd al-Raḥmān ʿUmayra and Muḥammad Ibrāhīm Nuṣayr (Beirut: Dār al-Jīl, 1996/1416), 5, 224-25; al-Nīsābūrī, *al-Masā'il fi-l-Khilāf bayna al-Baṣriyyīn wa-l-Baghdādiyyīn*, ed. Maʿn Ziyāda and Riḍwān al-Sayyid (Beirut: Maʿhad Inmāʿ al-Arabī, 1979), 47-55, 96; Ibn Mattawayh, *al-Tadhkira*, 1, 72-74; Eşref Altaş, "Fahreddin er-Râzî'nin *el-Cevherü'l-Ferd* Adlı Risalesinin Tahkiki ve Tahlili," *Nazariyat İslâm Felsefe ve Bilim Tarihi Araştırmaları Dergisi* 2, no. 3 (Ekim 2015): 142-46 (We would like to thank Eşref Altaş for sharing with us a draft Turkish translation of this treatise). For the conflicts between al-Jubbā'ī's judgements of combination, see al-Juwaynī, *al-Shāmil*, 471-78; al-Nîsābūrī, *al-Masā'il*, 96-100; al-Jurjānî, *Sharḥ al-Mawāqif*, ed. ʿAbd al-Raḥmān ʿUmayra (Beirut: Dār al-Jīl, 1417/1997), 2, 215-17. About the types of combinations, see Ibn Mattawayh, *al-Tadhkira*, 1, 293-97. For the causal relationship among combination, adjacent, and the natural tendency/impetus (*iʿtimād*), which are originated deeds, and related discussions, see Kādī Abdülcebbâr, *Nedensellik Kitabı*, 52-65, 167-73. For the study that examines the debates between the Basrians around the formation of bodies from atoms and the attribute of combination in the center of Ibn Mattawayh, see Dhanani, *The Physical Theory*, 90-95, 148-60.

including the problems contained by the idea of interpenetration.[12] Thus contiguity, which explains the atom's effect on forming the material world, was both the strongest and the most criticized aspect of atomism.

As a matter of fact, the contribution of those elements that have nodimension or boundary of their own, and thus form a dimensional body by contacting them, is an issue that al-Nazzām criticized and found impossible in the first place.[13] Ibn Ḥazm (d. 456/1064), the other important opponent of the atomism during the first period, specified when he was presenting the evidence of junction contained within the claims of those who proved the part, that following two finite and limited parts each other, finally indicates the existence of the intermediary part, which ultimately led to the possibility of infinite division.[14]

The evidence of contiguity was also very effective for the philosophers, who believed that the material world consists of *matter* and *form*, both of which allow estimative division, an assertion that could be used against the atomists. Ibn Sīnā (d. 428/1037), who found the infinite division of an assumed point in many places to be more appropriate for the correct imagination, criticized those who claimed that a body was formed by the contiguity of finite parts based upon their contention that the middle part prevented contact with the parts on the various sides.[15] According to him, the contiguity of actual undivided parts requires contact with other parts in the middle, and other middle parts are formed in the assumption. Thus, as a logical consequence of these never-ending contacts, the potential infinite divisions may occur in the estimation. That is, the middle (*hājib*) of the three parts forming the

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12    For example, Ibn Sīnā focuses on concepts such as succession, contiguity, duplication, inclusion, concatenation, mediation, edge, accompaniment, and singularity while examining the objects. See Ibn Sīnā, *al-Simaʿ al-ṭabīʿī*, 1, 177-83. Fakhr al-Dīn al-Rāzī also clarified the concepts of adjacent, contiguity, interpenetration, and encounter concerning with the *al-jawhar al-fard*. See Fakhr al-Dīn al-Rāzī, *Sharḥ ʿUyūn al-Ḥikma* (Tehran: Muʾassasāt al-Ṣādiq, 1415), 2, 101-05.

13    For a review of the debate between al-Nazzām and Abū al-Hudhayl and al-Naẓẓām's criticism of atomism, see Mehmet Bulğen, *Klasik İslâm Düşüncesinde Atomculuk Eleştirileri* (Istanbul: MÜ İlahiyat Fakültesi Yayınları, 2017), 79ff.

14    Ibn Hazm, *al-Faṣl*, 5, 224-25.

15    Ibn Sīnā, *al-Ishārāt wa-l-Tanbīhāt*, ed. Sulaymān Dunyā (Egypt: Dār al-Maʿārif, nd.) 2, 152-57; Ibn Sīnā, *Kitāb al-Najāt*, ed. Mājid Fakhrī (Beirut: Manshūrāt al-Āfāq al-Jadīda, 1982) 139-40; Ibn Sīnā, *ʿUyūn al-Ḥikma*, ed. ʿAbd al-Raḥmān al-Badawī (Beirut: Dār al-Qalam 1980), 24-26. In return, the *mutakallimūn* carried that debate into this medium part and tried to prove that its division was not a logical necessity; see. Ibn Mattawayh, *al-Tadhkira*, I, 89-90; al-Rāzī, *Sharḥ al-ʿUyūn*, 2, 102, 105; al-Rāzī, *Al-Mabāḥith al-Mashriqiyya fī ʿIlm al-Ilāhiyyāt wa-l-Ṭabīʿiyyāt*, ed. M. Muʿtasim-Billāh al-Baghdādī (Beirut: Dār al-Kitāb al-ʿArabī, 1990), 2, 19-21; al-Rāzī, *al-Maṭālib al-ʿĀliya min ʿIlm al-Ilāhī*, ed. Aḥmad Hijāzī al-Sakkā (Beirut: Dār al-Kitāb al-ʿArabī), 1987, 4, 53-54; 85-86; 96-97; al-Rāzī, "Cevher-i Ferd," 144-45; al-Jurjānī, *Sharḥ al-Mawāqif*, 2, 347-48.

line that prevents the contiguity of the two sides (*tarafayn*). In this case, the middle part must make contact with the parts on different edges in order to prevent them from touching each other. Thus, the middle part may be logically – but not actually – divided. Ibn Sīnā found no evidence of the combination used by the atomists to form the object that could serve as an admissible premise; for this reason, he tried to refute them by proving it can be used in the opposite direction.[16]

Although Fakhr al-Dīn al-Rāzī did not accept contiguity as a strong proof for denying atomism, he did take it seriously in his works.[17] While reviewing in his atomistic research all of the evidence produced for contiguity, he also stood on the evidence of rolling sphere upon which Mu'ayyadzāda centered his argument. According to this, the advocates of *jawhar al-fard* saw a sphere that contacted a simple object at a single point to transit the surface through successive points as evidence that a line consisted of indivisible points. Al-Rāzī replied by denying the intermediacy of moments to contiguity and their actual existences on the grounds that the point exists either in state of rest or can be apprehended by thinking of the moments. Contiguity at the moment of movement occurs due to the curved line's tangency to the flat surface, not because the contact point in the sphere touches the points in the objects.[18] He explained that an encounter place (tangent) of a real sphere faced with a flat surface would not be divided by the help of geometrical evidence and responded to the objections.[19] After the sphere returns to complete the circle on the surface to prove its *jawhar*, it encounters a point; however, the other point either disappears or there is no other point between the two points forming the contiguity. Essentially, the line is formed by the point at the first time of the encounter, and thus the line consists of a combination of two points, the surface consists of lines, and the object consists of surfaces. Al-Rāzī examined and rejected the contradictions (*munāqaza*) implied by the denials of the atom and their use to prove infinite division.[20]

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16    Ibn Sīnā, *al-Simā' al-Ṭabī'ī*, I, 199-200. This is the first evidence to be used for cancelling the part (*juz'*) in many philosophical works. For example, see Aqkirmānī, *Iqlīl al-Tarājim* (Istanbul: Dār al-Ṭibā'āt al-Āmira, H.1266), 8.

17    For the evidence scheme used by al-Rāzī to prove the part (*juz'*), see al-Rāzī, "Cevherü'l-Ferd" 104-08.

18    Ibid., 110-11; Rāzī, *al-Maṭālib*, VI, 47-49; *al-Mabāḥith*, 2, 34.

19    Al-Rāzī uses Euclid's theorems to prove that the encounter place will not be divided and answers the objections to this evidence. See "Cevherü'l-Ferd," 124-27; *al-Maṭālib*, 4, 47-52; *al- Mabāḥith*, 2, 34-41.

20    For the *mutakallimūn*'s criticism of the evidence of contiguity, see al-Rāzī, "Cevherü'l-Ferd," 115-16. To practice of *mutakallimūn* the evidence of contiguity and encounter, see al-Rāzī, "Cevherü'l-Ferd," 142-47; al-Rāzī, *al-Maṭālib*, 4, 85-88.

After al-Rāzī, voluminous works reviewed the matter in a similar systematic manner when studying the rational, logical, and geometrical evidence for *al-jawhar al-fard* and prime matter (*al-hayūlā*) Although these books often approached the issue by means of al-Rāzī's methods and proofs, different approaches were exhibited when the contents and compositions were taken into consideration. The *mutakallimūn* mostly tried to defend atomism; however, due to a certain degree of disagreement they sometimes avoided a definite conviction on atomism. Thus they continued to propose solutions to the subtle issues mentioned during the first period. In this context, the issue of contiguity was at the top of the evidence they were applying to the natural inquiries of the *muḥaqqiqūn*, who followed philosophical and theological methods. The *mutakallimūn* continued to use the evidence of the "rolling sphere" examined by Mu'ayyadzāda in line with the solution of atomist physics, especially in proving the indivisible part.[21]

## 2. Cancelling the Perpetuity of Contiguity in Time

Mu'ayyadzāda begins the treatise with the proof of the rolling sphere (*al-kurat al-mutaḥarrika*) used by al-Ījī to prove the existence of the indivisible part. Accordingly, the invisibility of a point of a real sphere, which is tangent to a flat surface, is an important proof of the undivided part's existence. This is so because if it is happening in one direction, then this point's division will form the surface; if it is in a multiple direction, then it will form the surface. Both possibilities will disqualify the sphere from being a real sphere. In addition, the rolling of the sphere in contact with all of these points proves the existence of undivided parts.[22] Thus, encountering a sphere that moves both in both a circular and a linear fashion simultaneously with a flat surface that does not accept a division guarantees the two shapes and the relationship between them. Otherwise, the points that are divided forever will eliminate the boundary of geometric shapes and objects, meaning that you will not be able to assume a real sphere or surface.

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21    For the proofs of the part (*juz'*) including the evidence of contiguity and the rolling sphere, see Shams al-Dīn al-Samarqandī, *al-Ṣaḥā'if al-Ilāhiyya*, ed. Aḥmad 'Abd al-Raḥmān Sharīf (Kuwait: Maktabat al-Falāḥ, 1985), 262-67; al-Āmidī, *Abkār al-Afkār*, ed. Aḥmad Muḥammad Mahdī (Cairo: Dār al-Kutub, 2004), 3, 55-64; el-Urmawī, Sirāj al-Dīn. "*Maṭāli' al-Anwār*," ed. Hasan Akkanat. "Kadı Siraceddin el-Ürmevi ve Metaliu'l-Envar (tahkik, çeviri, inceleme)," Hasan Akkanat. Doctoral Dissertation, Ankara Üniversitesi, 2006, 1, 230-36. Al-Taftāzānī, *Sharḥ al-Maqāṣid*, 3, 32. Although Shams al-Dīn al-Samarqandī mentions the pieces of evidences such as the point and movement used to prove the atom, he does not include any other evidence of contiguity, including the rolling sphere. See *Maṭāli' al-Anẓār* (Istanbul: Shirkat-i 'Ilmiyya, 1305/1887), 242-48.

22    For the relevant paragraph, see al-Ījī, *al-Mawāqif*, 2, 331-32. See edited text in this article, pp.162

Mu'ayyadzāda subsequently records that by narrating from the relevant chapter's commentary, Ibn Sīnā responded by assuming that a sphere that is tangent in one point to the flat surface will come into contact at another point with a divided time and a divided movement.[23] Thus, he agrees to the imagination of a piece (point) in the estimation and its infinite division and states that the sphere and the surface are combined with the line, not with the adjacent points, in accordance with the sensory signal.[24] He also presents the objection that, in such a case, an absurd result will emerge, such as a sphere touching the surface at two points and at the same time, saying that the first point of contiguity will be completely eliminated when the sphere touches the second point. Therefore, the sphere contacts the surface with a line in the condition of movement and with a single point in the state of rest. However, the actual time in which this contact with the point is realized is only in the estimation, because it is impossible to think of an actual time without thinking of an actual instant that has no actual existence. Thus, Ibn Sīnā rejects the *mutakallimūn*'s claim that the instant in which a sphere meets with a surface is a point, for, according to him, you do not need the transition to move from one point to an adjacent point, and from one instant to another adjacent instant, for that would eliminate the need for the sphere or a surface, apart from encountering points, and the line from these points does not even have to occur.[25]

Thus Mu'ayyadzāda tries to reveal the problem primarily by specifying two current approaches to contiguity. He rejects the second view, the idea that the touch point does not change with the change of the time (*baqā' al-tamāss*), and provides eight geometric proofs for its cancellation.[26]

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23    Mu'ayyadzāda translates this reply from al-Jurjānī. See *Sharḥ al-Mawāqif*, 2, 340-41.

24    See Ibn Sīnā, *al-Simā' al-Ṭabī'ī*, I, 201-02; Ibn Sīnā, *al-Ishārāt*, 166-67; Ibn Sīnā, *al-Najāt*, 147.

25    Ibn Sīnā, *al-Simā' al-Ṭabī'ī*, 1, 303-04. See edited text in this article, pp.162

26    The *ijāzatnāma* which was given by al-Dawānī, shows that Mu'ayyadzāda received a serious mathematics education. See Judith Pfeiffer, "Teaching the Learned: Jalāl al-Dīn el-Dawwānī's Ijāza to Mu'ayyadzāda Abd al-Raḥmān Efendi and the Circulation of Knowledge between Fars and the Ottoman Empire at the Turn of the Sixteenth Century," *The Heritage of Arabo-Islamic Learning: Studies Presented to Wadad Kadi*, ed. Maurice A. Pomerantz and Aram Shanin (Leiden and Boston: Brill, 2015 [2016]), 309-11. His scribe Nasīr al-Dīn al-Ṭūsī's compilation (*taḥrīr*) of Euclid by making some notes on the edge of the pages also shows his level and concern for that topic. For a related copy, see Nasīr al-Dīn al-Ṭūsī, *Taḥrīr Uqlīdis fi-l-Uṣūl al-Handasa wa-l-Ḥisāb*, Beyazıd Devlet, Veliyyüddin Efendi 2304.

The first argument (figs. 2 and 3) is taken from Theodosius[27] (160-100 BCE), *Kitāb al-Ukar* (*Sphaerica*).[28] Accordingly, when we draw perpendicular (*ʿamūd*) to form the diameter of the sphere from its tangent point to the surface, in the time of the continuity of the assumed contiguity, this diameter must either move or stop. In the first case, the movement of the sphere requires that this pole be part of a second pole that will occur as a result of its rolling (see Fig. 3). The fact that a right angle is part of another right angle is impossible in terms of the part-whole relationship. In the second probability the diameter stops, which means that the sphere also stops and a contradiction (*khulf* [reductio ad absurdum]) occurs, because in the first case the sphere is assumed to be rounding, and that possibility could also be refuted.
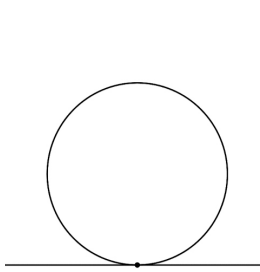


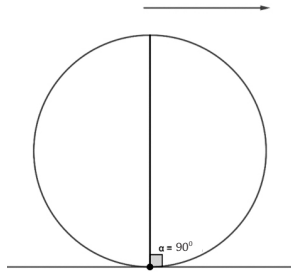**Figure 1.** The sphere touches the surface at only one point

**Figure 2.** The first position of the sphere: The diameter is perpendicular to the surface at the tangent point
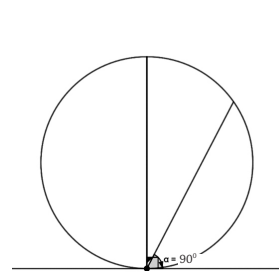
**Figure 3.** The second position: With the motion of the sphere the first right angle becomes the part of newly formed right angle.

The second argument benefits from the work of Autolykos (360-290 BCE), namely, *al-Kurat al-Mutaḥarrika*.[29] Hence, when the sphere rounded a tour with a constant velocity (*muʿtadil*), each point on its surface draws parallel and proportional arcs to each other at the same time (Fig. 4). If the contact continues at some point, as is claimed, the rate of an arch in which the tour of the sphere

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27  Nasīr al-Dīn al-Ṭūsī, after revealing the project of the *taḥrīrāt*, prepared the texts entitled *taḥrīr*, which replaced the original translations by preserving the classical names of the books and authors. Therefore, the references of Muʾayyadzāda in the first and second arguments in the classical sources appear in texts known al-Ṭūsī's *al-Mutawassiṭāt*. Due to the fact that it has a possesion record, the copy of *Taḥrīr al-Mutawassiṭāt* that we have and was used by Muʾayyadzāda is now located in the Süleymaniye Library Ayasofya Collection, MS 2760.

28  A related theorem is the fourth figure of *Taḥrīr al-Ukar*'s first article. See Nasīr al-Dīn al-Ṭūsī, "Taḥrīr al-Ukar li-Thāwudhūsyus," in *Majmūʿ al-Rasāʾil* (Hyderabad: Maṭbāʿat Dāʾirat al-Maʿārif al-ʿUthmāniyya, 1358), 4.

29  A related theorem is the second figure of *Taḥrīr al-Kurat al-Mutaḥarrika*. See Nasīr al-Dīn al-Ṭūsī, "Taḥrīr al-Kurat al-Mutaḥarrika li-Awṭūlūqus," in *Majmūʿ al-Rasāʾil* (Hyderabad: Maṭbāʿat Dāʾirat al-Maʿārif al-ʿUthmāniyya, 1358), 3.

transits in that point, for instance in an hour, should be smaller than the rate at which another point transits at the same time. So, the sphere in the tangent point is not removed from the touch position, but continues to revolve at other points as a requirement for the contiguity's continuation. This continuation of each tangent point by stopping for a while– the sphere will necessarily come into contact with the surface at one point at a time – results in the break off of the sphere, which is also clearly invalid.

The third evidence suggests that if the contact's continuity is accepted in time, then the touchpoint will not be separated from its position for as long as the contact continues. Yes, there is actually a point that does not change its position in a rotating sphere. But this particular point can only be the polar points of a sphere that revolves around its own axis. However, our assumption is that the moving sphere is rolling, as opposed to rotating, around its own axis. Therefore, if the assumption is accepted, a contradiction emerges: The sphere both rolls and does not roll (i.e., it revolves) around its own axis at the same time.

In the fourth argument, a large circle is drawn on a sphere passing through its two touchpoints (A and B), and it is assumed that the sphere moves on it and on the straight line on the surface (Fig. 4). Continuing the contiguity at the first point (A) continuously up to the second point (B) will reveal the following possibilities: (i) If the second contact occurs at a point other than the arc between the two points, the sphere will contact with the surface at more than one point; (ii) If the second contact occurs on the aforementioned arc, either (i.i) this arc between two points coincided with the straight line on the surface – so that it touches the surface at every point – which was assumed to be tangent only at one point; (i. ii) if the arc and the straight line do not overlap with each other, it is necessary to acknowledge that the sphere is either (i.ii.iii) a leap (ṭafra) movement in order to form the second contact, or (i.ii) that the sphere does not roll over this circle. All of these assumptions contradict the first assumption.
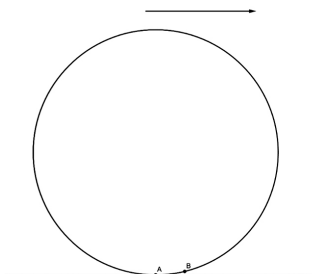


**Figure 4.** Point (A) is currently in contact with the surface, and point (B) will come into contact with the rounding of the sphere

The fifth evidence indicates that each point between the two assumed touchpoints on the arc mentioned in the previous argument (Fig. 4) is closer to the surface than the second contact point. When we handle this set of points, a point that is closer to the first tangent point is closer to the surface than a point that is farther away from it. In this case, if the closer point does not reach the surface, then the farther point also does not reach the surface. As a result, since there is no point in the arc that occurs between the two points (A and B) that does not come into contact with the surface, it is impossible for the contiguity to happen with points that do not follow each other and the continuity of the contact at some point. In other words, the tangent points must have changed as time passed, and these points must be points that follow each other.

The sixth argument is based on the assumption that two touchpoints formed an arc and a hypothesis of a circle (Fig. 4), as in the previous two arguments, and the postulate that the touchpoints were not removed from their positions. If we assume that the touchpoints are not separated from their positions, then they must complete the exact return of the points between them before they can complete a full rotation. But as the fifth argument revealed, it is impossible to complete distant points before close points can complete the movement. Hence, a contradiction emerges here.

The seventh argument is based on the smallest angle evidence included in Euclid's (third century BCE) *Elements*. As proved in the fifteen shape/theorem of the three articles of the *Elements*, the angle formed between a circle and a straight line touching it is is the smallest possible narrow-angle.[30] One potential result of this theory is that smallest narrow-angle formed between the sphere's perimeter and the line on the surface does not accept a distance that will occur in the aperture. The contact point's continuity, along with the sphere's movement, requires a distance from the aperture of that angle and hence a smaller new angle. This also reveals a contradiction.

In the eighth argument, the contact with the first point where the sphere is tangent to the surface continues until contact is made with the second point. If it is accepted that the moment is eliminated, then three alternatives, all of which are invalid, appear: (i) If there is a single point between the first contact point and the surface, then the three points must come in succession, including the surface, the sphere, and the point between them. (ii) If there is more than one point between

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30    Nasīr al-Dīn al-Ṭūsī, "*Taḥrīr Uṣūl al-Handasa wa-l-Ḥisāb*: *Eukleides'in Elemanlar Kitabının Tahriri*, prep. İhsan Fazlıoğlu (Istanbul: İstanbul Yazma Eserler Kurumu Başkanlığı, 2012), 40b.

the two touchpoints, then the sphere must transit a certain amount of distance. This is impossible because the distance, time, and movement should be proportional to each other. (iii) The absence of distance between the tangent points means that these two points are coincident points, which requires that the contact has not yet been interrupted at the first point. The assumption is that when contact with the second point occurs, it is assumed that the first point is eliminated. This is a contradiction.

Mu'ayyadzāda invalidates with these arguments by claiming that it is possible to assume a cross-section in which a rolling sphere has been touched at this time. Accordingly, no crossing section is thought to be constant at the time of movement between the points that are imagined to be touched by a sphere on the surface. It is a factual reality that the sphere moves on a flat surface by touching points that are lined up to follow each other and appear repeatedly after they disappear, one after another. Otherwise, it becomes difficult to defend contrary possibilities because they will cause many logical contradictions, as explained above.

## 3. The Well-Known Doubt: The Movement of the Sphere on the Surface

After canceling the idea of a perpetual of the contiguity in time in a philosophical sense, Mu'ayyadzāda continues the treatise with the subject of the well-known doubt (*al-shubha al-mashhūra*), which is the main reason why he wrote this text. This issue, which responds to the question of how a sphere that moves on a flat surface passes a certain distance, is important because it distinguishes the theological and philosophical perspectives on nature. The philosophers argue that the sphere reaches a certain distance by passing the points that are assumpted to be infinite in the mind and the constant time between them, whereas the *mutakallimūn* claim that each point where the sphere touches the surface also creates the ends of distance and that the sphere reaches a limit by contacting these points (i.e., moments and ends). Both theories discussed the concerned issues related to theoretical physics, such as movement, time, distance, and space around this core problem, in the context of their metaphysical principles and opinions about the universe.[31]

Mu'ayyadzāda briefly summarizes this well-known doubt/objection.

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31    It's been long discussed whether is the touch of the sphere to the flat by point or line and the connection of this incident with the theories of time and movement. See Ibn Sīnā, *al-Simāʿ al-Ṭabīʿī*, 1, 201; el-Rāzī, "el-Cevherü'l-ferd," 127. Also see al-Rāzī, *al-Maṭālib*, 6, 34; al-Āmidī, *Abkār al-Afkār*, 3, 61-64; Akkanat, "Kadı Siraceddin el-Ürmevi," 234-236.

The sphere that moves on a flat surface and crosses it from one end to the other, and every assumed point that it contacts between the beginning and the end, also creates a boundary of the sphere's distance. As long as this sphere continues to move, it cannot remain at the border for more than a moment. Since the form of the movement is mediating between the beginning and the final points, there is neither a "before" nor "after" for the moments/limits that the mover travels through.[32]

This objection responds to the question of how the movement, which is a continuous state, crosses the parts that form the specific distance (i.e., instant, border, and end) and is considered finite and limited in the external world. It also discusses the relationship of continuity and discontinuity around the spatial movement.[33]

In order to grasp this issue, Mu'yyadzāda says that you first need to know the types of occurrences (ḥuṣūl). According to this, the *falāsifa* divided ḥuṣūl into three parts: gradual, non-gradual/momentary, and temporal. There is a compound identity (huwiyya) for gradual ḥuṣūl like a movement, whereas momentary ḥuṣūl occurs only in a moment or in a moment with time. Temporal ḥuṣūl, which is the vehicle between the two, has no abilty to overlap with time and distance. This means the movement's existence not only at the time or at the end of the distance, but at all assumpted times.[34] Accordingly, the arrival (wuṣūl) of the sphere to a limit is temporal in the sense of momentary ḥuṣūl, or should be either gradual or momentary, according to the aforementioned classification. Since gradual ḥuṣūl requires the the limits of the distances be separated, and momentary ḥuṣūl – whether at the moment or in time or only in time – is contradictory, both are false.[35]

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32 See edited text pp.167

33 The existence quality of the rest between the two linear lines subjected in the *risāla*, and also a relation of motion as a flowing state to the ends/boundaries of the distance it passed, has been discussed in different headings in the theological and philosophical works. After mentioning the famous evidence that philosophers adopted and used to prove the state of rest between the two movements, al-Ṭūsī speaks about Ibn Sīnā's and al-Rāzī's criticism of it and then proposes a solution through the types of occurrence (ḥuṣūl). See Nasīr al-Dīn al-Ṭūsī, *Sharḥ al-Ishārāt wa-l-Tanbīhāt* (Egypt: Dār al-Ma'ārif, nd.) 3, 154-59. Also see al-Jurjānī, *Sharḥ al-Mawāqif*, 2, 228. Quṭb al-Dīn al-Rāzī also discusses the same topic in detail. See Quṭb al-Dīn al-Rhāzī, *al-Muḥākamāt*, ed. Karīm Faizā (Qum: Matbū'āt-i Dīnī, 1383/2004), 3, 200-09. If the topic of *risāla* is taken into consideration, Mu'ayyadzāda expresses an objection that the *mutakallimūn* directed to this famous evidence. For a detached *risāla* discussing this issue according to the example of rolling sphere, see Sinān Pasha, *Jawāb Sinān Pasha 'an 'I'tirāḍ al-Qasṭallānī fī Bahth al-Juz' Alladhī lā Yatajazza'*, Süleymaniye Library, Hasan Hüsnü Paşa 600, 92a.

34 According to Mu'ayyadzāda, al-Jurjānī called "momentary (daf'ī) ḥuṣūl" reaching sphere to one of the boundaries of distance, but al-Ṭūsī devoted momentary ḥuṣūl in the first part and classified temporal ḥuṣūl as "realized at this time and at the end of the time" and "realized only in time without the end of the time." For the momentary and gradually ḥuṣūl in al-Jurjānī, see al-Jurjānī, *Sharḥ al-Mawāqif*, 2, 226-28; For the types of ḥuṣūl in al-Ṭūsī, see *Sharḥ al-Ishārāt*, 3, 160-61. For the types of ḥuṣūl, see Quṭb al-Dīn al-Rāzī, *al-Muḥākamāt*, 3, 20-211.

35 For Mu'ayyadzāda, the continuation of ḥuṣūl on a border requires the following two invalid (bāṭil)

Mu'ayyadzāda needs to make an additional statement to clarify this view. Accordingly, it may be thought that the movement occurred either during the time of rest or the time of movement as a rational possibility. The first case contradicts the assumption; however, its occurrence during the time of rest reveals three options: This movement can occur (i) either to a boundary (end), (ii) or in a boundary (at a moment), (iii), or from a boundary (from beginning). If the movement is always toward the end, then the moving object will never reach that border, which is contrary to the assumption. If the movement is on a boundary, then it requires a division of the moment towards its extension. It is also incorrect to claim that the movement has a starting boundary, because the quality of intermediacy prevents it from getting together with the attribute of location (*kawn*)[36] at this border. In this case, as gradual *ḥuṣūl* requires the division of the boundary and momentary *ḥuṣūl* requires the succession of the moment, it will be more accurate to explain contiguity according to temporal *ḥuṣūl*.[37] Since movement is the sum of the occurrences of the moments that arrive (*wāṣil*) constantly to some place and perishes (*zā'il*) from there, namely, they are absent and existent in relation with the contact, the sphere's arrival at some point through movement is in time and its cessation is in the moment. Thus, time is only perceived by continuity, and moment by the interruption of movement (i.e., discontinuity is also stated).

According to Mu'ayyadzāda, if it is taken into consideration that the points crossed by the rolling sphere between the movement's beginning and end also constitute the boundaries of the distance transmitted, then the contiguity's existence is the sphere's arrival (*wuṣūl*) to that border, and its lack is the destruction (*zawāl*) of its existence on that border by moving toward another border. Thus, movement makes a temporal contribution by prioritizing the ends, moments, and points without

probabilities: (i) At this time, if nothing else can move on this border, the moving object will stop here, contrary to the assumption. (ii) When movement is on another boundary, the parts of the movement and its boundaries are combined in the external world.

36   Movement, which was an intermediary between the beginning and the end, is the sum of the momentary occurrence in this sense. Because the atomists say that movement is made up of consecutive non-breaking occurrences, movement consists of a succession of undivided assumed location (*ḥayyiz*) and the sum of the moments. For example, see al-Rāzī, *al-Mabāḥith*, 1, 671. In this direction, the attribute of location (*kawn*) is described as the sudden emergence of something out of nothing (*daf'atan wāḥida*) not gradually. See Al-Āmidī, *al-Mubīn fī Sharḥ al-Ma'ānī al-Alfāz al-Ḥukamā' wa-l-Mutakallimīn*, ed. Ḥasan Mahsūd al-Shāfī (Cairo: Maktabat al-Wahba, 1413/1993), 100.

37   Mu'ayyadzāda declares there is no need to argue about these concepts because philosophers also defined momentary *ḥuṣūl*, which is a cessation of arrival occurrence on a border of the distance, as a temporal *ḥuṣūl*. See edited text pp. 166

conjoining any *kawn* at the boundary of the distance. This happens in time, not during the uppermost moment of the assumed occurrence. At this time and point, to assume the part and the moment, the movement and the arrival that exists at the same point must be eliminated in such a way that the part will combine with another moment at another boundary. Every point that comes together with the contiguity means here also the lack of contact at the first point, and thus the sphere transits between two points by touching the moments in time. Since the first touch, which requires distance and time have certain boundaries in time of motion of the sphere is not continuous, it is also explained that contact is in conjunction with temporal movement and does not need to be continuous in the time of gradual motion.[38]

Mu'ayyadzāda also states that there is no need to claim the existence of a definite distance (*bu'd*) between the points and the sphere's surface apart from the touch point, as philosophers did. Previously, Ibn Sīnā's view that the first contact remains until the second touch (*baqā' al-tamāss*) was invalidated by several geometrical proofs. The assumed time is also part of the time when the contact is destroyed, as it is limited by the instantaneous occurrence of both touches. Therefore, being the touch in that imaginary point ensures that the first contact does not continue and disappear at the same time. According to him, this explanation also ends the confusion about movement in terms of intermediation as well as the subject of the distance at a border.[39]

In fact, there is no movement at the beginning and at the boundaries of the distance, for if there were, it would be possible to reach this limit without moving in the first place. Since movement is a mediator between the beginning and the end, in fact, what is meant by movement is arrival and departure. But because movement is identified by time and not the moment, the line comes to mind once more. The occurrence of movement is not at the end of the distance but at the time of departure, for there is no determined moment for its occurrence in the time of movement. For this reason, the infinite number of boundaries and ends

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38      See edited text pp. 168

39      Mu'ayyadzāda attributes that confusion to "some virtuous persons (*fāḍil*)." In fact, many scholars dealt with the same issue. See al-Rāzī, al-*Mabāḥith*, 1, 674-75; al-Rāzī, al-*Maṭālib*, 6, 32-34; al-Jurjānī, *Sharḥ al-Mawāqif*, II, 226-28. Abū al-Barakāt al-Baghdādī, *Kitāb al-Mu'tabar* (Hyderabad: Dā'irat al-Ma'ārif al-'Othmāniyya, 1357), 2, 30-34. Dāwūd al-Qayṣarī also records that Ibn Sīnā and al-Ṭūsī were hesitant about continuity between the renewed momentary motion and the flowing temporal one. See al-Qayṣarī, *Nihāyat al-Bayān fī Dirāyat al-Zamān*, ed. Mehmet Bayrakdar (Kayseri: Kayseri Belediyesi Yayınları, 1997), 168. Al-Qayṣarī indicates that there is not a real, but rather an estimative, continuity between the two movements. See al-Qayṣarī, *Nihāyat al-Bayān*, 49. See also the theory of time in al-Qayṣarī: Osman Demir, "Dâvûd el-Kayserî'nin Tasavvuf Metafiziğinde Zaman," *Osmanlı'da İlm-i Tasavvuf*, ed. Ercan Alkan and Osman Sacid Arı (Istanbul: İSAR Yayınları, 2018), 431-48.

can be considered rationally, between each boundary and its endings, which are assumed in time. Movement takes place across all of these boundaries by means of conjoining time and admitting infinite division. Also, there is no exact limit for the distance that overlaps with time and movement and admits division.

After canceling the endurance of the contiguity in time and explaining his opinion on the relationship of movement and rest by agreeing to temporal occurrence, Mu'ayyadzāda comes to the main topic (*maṭlūb*) and begins to explain how the sphere rolls on the flat surface. He eliminates three options that have no effect on this subject before specifying his preference, as follows:

i.   Contiguity does not occur via the succession and regularity of the points that renew and expire constantly one after another, because accepting this requires successive points and moments to follow each other. Even one of them is enough to prove the part's external presence.

ii.  Contiguity does not occur by the perpetuity of the essence of the flowing point, for its identity continues from the beginning of the roll to the end. The point is not moving by its essence, and this impossibility is understood from the contact point on the surface more than the sphere.[40]

iii. Contiguity does not occur by two stable lines, one of which is linear and the other of which is circular, and their parts are together. Because there is no line in the sphere or on the surface, contiguity cannot make them appear. The thing that provides contiguity is the same as before and after the contact. And in any case, there is an actual line in the middle.[41]

After eliminating these possibilities, Mu'ayyadzāda concludes that the sphere comes into contact with the surface with to lines and the part's of this line doesn't encounter with each other at the same time (*ghayr al-qārr*). In other words, if it causes movement then there is no prior or post contact. If the rolling of the sphere is a thing that has no actual parts, its pieces do not come together, continuous and single in the *nafs al-amr* (fact of matter). The thing that provides contact is similar: A line whose parts do not meet each other.[42]

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40   Here, Mu'ayyadzāda is referring to the *al-shubhāt al-ʻāmma* debates and the treatise written on this topic. Several copies of this treatise address the question of whether something that moves does so across a certain distance constantly through a single space or multiple spaces? For example, see Mu'ayyadzāda, *Fī al-Shubhat al-ʻĀmma*, Köprülü 1596, 142-147. This topic has also been discussed by al-Jurjānī and has its own literature. For the relevant chapter, see al-Jurjānī, *Sharḥ al-Mawāqif*, 2, 244-45.

41   See edited text pp. 169-170

42   See edited text pp. 170

Thus, Muʿayyadzāda solved the problem of admitting actual infinite parts that presumably this contiguity can lead it by stressing that contiguity caused by a line also proved the point's external existence by applying the categeory of *nafs al-amr*,[43] which was used in the ontology of mathematical proof. He states that this claim is not a denial of the part, as was thought. However, Ibn Sīnā, who explained the spheres contiguity with an extended point (line), did this in order to reject the idea of the part. In accordance with his acceptance that both movement and time are continuous and have no starting parts, he argued that there is no first part for the contiguity, which is moving and in a continuous state. He contends that a sphere in a state of motion contacts the surface with a real line, but that touching it with a point that has no actual body only takes place in the imagination (*wahm*).[44]

In return, Muʿayyadzāda finds it sufficient that the realization of momentary touch, whether or not this instant exists in the external world, in *nafs al-amr* to prove the point, and like this the realization in the time of movement to prove the line. For him, estimating time and movement is not going to damage this idea. In addition, the ambiguity (*ishkāl*) of the infinity of an actual-existing point in the rational assumption is out of the question for each line that has assume infinite points on it. Because *wahm* cannot comprehend infinite situations, the intellect (*ʿaql*) comprehends the infinite points between these two lines in a universal and encompassing way. This assumption does not mean that they come out of potentiality and into actuality. For this reason, since the contact at the moment is the reason for the external point, based on the intellectual assumption that the moments can be infinite, the point in the external existence may be infinite. Thus, the contiguity that was imagined as finite in external and infinite in *wahm* can be explained by means of the category of *nafs al-amr*.[45]

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43  The concept of *nafs al-amr* seems to have been invented during the process that started with Sayyid Sharīf al-Jurjānī in the fifteenth to explain that mathematical models can give true knowledge about reality even though they were assumed to be estimative and to satisfy the need of guaranteeing the existence of mathematical entities via independent ontological-epistemological principles. Fazlıoğlu, İhsan, "Between Reality and Mentality: Fifteenth Century Mathematics and Natural Philosophy Reconsidered", *Nazariyat Journal for the History of Islamic Philosophy and Sciences* 1, no. 1 (November 2014): 1-39.

44  Muʿayyadzāda finds two disabilities in Ibn Sīnā's solution of contiguity with the line, which al-Rāzī and al-Jurjānī had pointed out earlier. The first one is that this kind of discontinuous situation is not reasonable, otherwise the movement (i.e., time and transition) needs to be reasonable; however, Ibn Sīnā refuted this. Second, as the sphere touches the line during the movement, it also touches every instant assumed in that time. This leads to assume the touch is not with the line, but with the instant. See edited text pp. 171

45  See edited text pp. 172

Mu'ayyadzāda draws attention to the fact that the main debate is the point's external existence.[46] While the philosophers agreed that the present point was in the assumption, the *mutakallimūn*, accordng to their view on the material world to an existing point in the external, wanted to avoid an impossible situation, such as the touch of two lines with a thing that did not exist. Thus, all of them took care to prove the point's ontological existence, which is the focus of the theory of *al-jawhar al-fard*. Mu'ayyadzāda indicates that the current and most appropriate situation for contiguincy is that the essences of the objects are divided in directions (line and surface). Thus, the reality of the point is proved by congruity to *nafs al-amr*, the reality of the line is proved by movement and touch, and the contiguity that depends on the two points' existence is also revealed with the line.

Mu'ayyadzāda records that contiguity, which is a constant thing in *nafs al-amr*, is more appropriate with the momentary occurrence being in the line and does not require an interpenetration (*tadākhul*). Accordingly the surface, which is an object, attaches the whole body (i.e., not just all or some parts of it), and only spreading (*sarayān*) in two directions does not require the object and the surface to be divided into directions. He also assumes that something can be contact another just because it is just an object, not because of the parts or some specific part of it. It is also the contiguity of surfaces with lines and the contiguity of lines with points. And, in fact, it needs an argument to prove otherwise. The mind's determination of some of the body's aspects in a sensory signal does not prevent contiguity to attach to the body, because an object spreads in some directions in the sensory signal like the ends.[47]

According to Muayyadzāda, one cannot deny (*man'*) the opinion that the permanence of the surface will require endless surfaces or that the surfaces must end on a substantial surface (*jawharī*) that essentially exists. Yet, what the surface is attached to (*ma'rūḍ al-saṭḥ*) is not to be divided in all directions, which means that it will eventually have to assume a part that is divided here, that it ultimately ends on the surface divided into two directions. This surface will either last forever (*yatasalsal*) or end on a surface that exists with the latest substantial surface. It is not possible to imagine similar things on the line and the point. As a vehicle of contiguity, it is also wrong to refer to a body, a part of it, or an entity that exists

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46  Mu'ayyadzāda addresses here is the evidence that many *mutakallimūn* have used to prove the point's external presence: According to this, an object whose existence is not suspected touches on the surface divided by width and length, the two surfaces touch on the line divided only by the length, and the two lines touch on the positioned and never indivisible point on the grounds of interpenetration (*tadākhul*). For this evidence, also see al-Rāzī, *al-Mabāḥith*, 2, 37; al-Jurjānī, *Sharḥ al-Mawāqif*, II, 337-338.

47  See edited text pp. 173

in the external world with a body. The vehicle of contiguity assumes that the body has a surface. If there is no surface, contiguity cannot be attached to the body in any way. Like this, two lines come into contact with a point and two surfaces with a line. In that case, it is not difficult to comprehend the body as characterized in the *nafs al-amr* with conceptual entities or our thinking of some situations in the body in a way that overlapped the *nafs al-amr*, to ensure that the current conditions are attached to the body.[48] Then, contiguity is not an external entity but rather a peculiar relation of positional beings. If this were not the case, then all of these contradictory things could not be attached to the objects at the same time.

Therefore, it is wrong to say that the reason for the contiguity should be outside; if this is expressed, it is also necessary to say that the reason for the contraposition (*muḥādhāt*) must also be outside. It is assumed that the alignment of two things is realized in the ends (*aṭrāf*), such as contiguity, but not like this. According to Mu'ayyadzāda, scholars such as Ibn Sīnā, Quṭb al-Dīn al-Rāzī (d. 766/1365) and al-Jurjānī (d. 816/1413), expressed the same opinion with different phrases and implied that the meaning of the actuality of the thing that provides the contiguity is the entification (*ta'ayyun*) and distinction (*tamayyuz*) of reason to that touch. For instance, al-Jurjānī stressed that there is necessarily one direction condition in a body whose extension ends in one-direction, and also there is necessarily one direction condition in a surface whose extension ends in one-direction.[49] Quṭb al-Dīn stated that the differentiation of the attributes does not require external divisions in the body and that the meaning of the actuality is more general than the existence of external beings. In addition, Quṭb al-Dīn strengthens his claim by citing the view of Fakhr al-Dīn al-Rāzī: "The contiguity of the celestial spheres of every star with the celestial sphere of Atlas occurs at a certain point and assumed boundaries, and that this point is not external."[50] Ibn Sīnā argued that the limits in compound bodies are potential, which is, in fact, the case of contact.[51] When these

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48  Mu'ayyadzāda gives following examples to prove the assumption of something that is permanent in *nafs al-amr* in the external; i) the attachment of light to Earth for being in the face of bright bodies and ii) connection of different colors and lights to the adjacent body because of our imagination of them on objects according to true estimation.

49  See al-Jurjānī, *Ḥāshiya 'alā Sharḥ al-Tajrīd*, Hekimoğlu Ali Paşa 833, 220.

50  See Quṭb al-Dīn al-Rāzī, *al-Muḥākamāt*, 3, 199. In the chapter where Quṭb al-Din al-Rāzī is quoted, Fakhr al-Dīn al-Rāzī confutes Ibn Sīnā's argument that there must be a rest on the air between the rising and descending movements of the stone which is used as astronomical evidence to prove the succession of the instants. Accordingly, the Zuḥal sphere touches the sphere of fixed stars with a single point that occurs at indivisible instant, because the presence of the time of rest between these two moments interrupts the spheres' movement. See al-Rāzī, *al-Maṭālib*, VI, 44-45.

51  Ibn Sīnā, al- *Simā' al-Ṭabī'ī*, 1, 91.

people said the contact point actually exists, they meant its intellectual existence and its effectiveness at the moment of estimation. [52]

After these footsteps, according to Mu'ayyadzāda, contact occurs in reality when the sphere's surface makes contact with the flat surface. Therefore, two points are appointed on the sphere and on the smooth surface (*ta'ayyun*). As the sphere rolls over the surface, it continues to touch these two surfaces. Due to this movement, a smooth circular line in the sphere as well as a straight line on the smooth surface become appointed and distinguished. At any given moment assumed in that time, two points appointed from this line, because it is not possible to imagine two instants without time between them or two points without a line between them. The status of the sphere and the surface is like that before the contact. As time and movement are continuous, we think of the two lines (i.e., the surface) and not the successive points at the moment of rolling. [53]

Mu'ayyadzāda believes that this answer is appropriate for Ibn Sīnā, who claimed that the sphere had come into contact with the surface on line at the time of movement. However, it is necessary to think that this line is in the estimation and not in the external, because what provide contiguity (*mā bihī al-tamāss*) are the ends, and contact is unthinkable without considering them.[54] Thus, it is understood that Ibn Sīnā's view about the actual time, which the contiguity realized by the point, is only in the estimation. And therefore the context of the word (*siyāq*) requires that the contiguity must be with the line in the *nafs al-amr* and with the point in the estimation. But a serious study also requires the contact of the two surfaces at the time to be like the contiguity in the instant. However, the fact of contiguity's occurrence with two lines at time will require the line to be at this specific time. But this is absurd. In this case, he states that three possibilities arise, as follows:

i) Momentary contiguity is completely rejected both in reality and in estimation. ii) The occurrence of contiguity in two points on a surface is canceled on the grounds that it requires the realization of infinite points. iii) The occurrence of contiguity with two lines has no reality in the instant and therefore is accepted invalid on account of the fact that this necessitates contact with the non-existent. iv) It is said that contiguity will be realized in two surfaces. With this final statement, the desired demand (*maṭlūb*) is proven and there is no need to prove the two lines for contact in time.

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52    See edited text pp. 175-176
53    See edited text pp. 176-177
54    According to Mu'ayyadzāda, the word "*bā*" in the phrase "*mā bihī al-tamāss*" is for causality, not for the connection (*şila*). Contiguity also attributes to its reason through the expansion of meaning (*tawassu'*) as though it is used the phrase "*mā bihī al-muḥādhāt*" about the assumed ends.

## Conclusion

In this treatise, Mu'ayyadzāda sought to solve the evidence of contiguity that was commonly used in the direction of proof and refutation of the indivisible part and the well-known problems that arose and have been discussed for a long time, such as the relation of movement to space, the time-instant relationship, and accessing the rest between two linear movements by taking into account the current claims and objections. In this respect, he first canceled the Avicennian idea of the perpetuity of contiguity between two points by using geometrical proofs. Subsequently, he adopted temporal occurrence between a momentary occurrence taken by the *mutakallimūn* and a gradual occurrence taken by the *falāsifa* in terms of time and movement. In this regard, after reviewing the current opinions, he concluded that the moving sphere has come into contact with a discontinuous line to the surface between the opinions that claim that the contact is a point and a continuous line and explained the problems that it has caused. As far as we can identify, his reference to the category of *nafs al-amr* to clarify contiguity can be seen as a new model of explaining the solution of the "well-known doubt".

In the part where he canceled the perpetuity of contiguity, Mu'ayyadzāda used a strong reference frame by attributing to ancient authors such as Theodosius, Autholycus, and Euclides and explaining the form of contiguity accourding to the major names of theoretical thought such as Ibn Sīnā, Fakhr al-Dīn al-Rāzī, al-Ījī, al-Jurjānī, Quṭb al-Dīn al-Rāzī, and Naṣīr al-Dīn al-Ṭūsī. While presenting his claims in the logic of the debate (*al-manʿ wa-l-naḳḍ*), he interpreted the ideas confirming his basic thesis either directly or in the direction of his allegations. As it focused on the theoretical and subtle problems reflected in the natural field, it is necessary to seriously follow up the issues, evidences, and concepts that it handled from the works of the referenced authors.

The treatise is also important to demonstrate the level of debate on atomism and hylomorpfism during the sixteenth century, intellectual accumulation, and the method of verification. All of this needs to be analyzed in many respects. In this regard, the author, who maintains the claims of a *mutakallimūn* façade to a certain extent, has also used philosophical objects to develop an opposing argument as well as to create a new model that melds them into their views. In order to make his natural theory even more clear, it will be necessary to publish the treatise of "the common doubt" (*al-shubhāt al-ʿāmma*) that examines the space-movement relationship as complementary.

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## C. Critical Edition

/ [١٠٨ظ] بسمِ اللهِ الرحمن الرحيم
وبه نستعين

قال صاحب المواقف في بحث الجزء الذي لا يتجزّأ: «نفرض كرةً تُماسّ سطحًا مستويا فما به المماسّة لا تنقسم وإلا فإمّا في جهة فهو خطّ أو أكثر فهو سطح فلا تكون الكرة كرةً ثمّ نفرض١ تدحرجها بحيث تماسّه بجميع أجزائها فيكون جميع الأجزاء غير منقسم.»٢

وقال الشارح المحقّق العلّامة أحسن٣ إكرامه في دار المُقامة:

وأجاب ابن سينا بأنّ الكرة إذا ماسّت السطحَ على نقطةٍ فإنّها لا تماسّ على نقطةٍ أخرى إلا بحركة منقسمة في زمانٍ منقسم؛ ثمّ إنّ تلك النقطة ليست مجاورةٍ للأولى متّصلةً بها وإلا كانت منطبقةً عليها؛ إذ لا يمكن٥ أن يكون اتّصال بين أمرين غير منقسمين إلا بطريق الانطباق بينهما بالكلّيّة فلا بدّ أن يكون بين النقطتين خطٌّ وكذلك٦ الحال في سائر النقط التي يقع بها التماسّ بينهما فلا يكون محيط الكرة ولا السطح المستوي مركّبا من نقطٍ متتالية.

**لا يقال:** فعلى ما ذكرت لا تحصل المماسّة على النقطة الأخرى إلا بعد الحركة ففي حال الحركة لا بدّ من المماسّة فإن كانت المماسّة على النقطة الأولى كانت الكرة ساكنةً حال كونها متحركةً، وإن كانت على نقطة متوسطةٍ بينهما لزم خلاف المقدّر على أنّا ننقل الكلام إلى تلك المتوسطة فوجب أن لا تكون بين النقطتين المماسّتين واسطةٌ فيلزم تتالي٧ النقط. لأنّا نقول: المماسّة على النقطة الأولى وإن كانت حاصلة في آن لكنّها باقية في زمان حركة الدحرجة المؤدية إلى المماسّة على النقطة الأخرى ففي آن حصول هذه المماسّة الثانية تزول المماسّة الأولى وهكذا كلّ مماسّة على نقطة تحصل في آن وتبقى زمانا ولا ينافي ذلك استمرار حركة الكرة كما يظهر ذلك بالتخيّل الصادق.٨

١    ل: تعرض.
٢    كتاب **المواقف** (مع شرحه للجرجاني) لعضد الدين الإيجي، ٢/ ٣٣١.
٣    ك + الله.
٤    ج ل ــ منقسمٍ.
٥    ل: إذا لم يمكن.
٦    ل ــ كذا.
٧    ك: التتالي.
٨    كتاب **المواقف** (مع شرحه للجرجاني) لعضد الدين الإيجي، ٢/ ٣٤٠-٣٤١.

أقول: بقاء التماسّ بنقطة ما⁹ زمانًا باطل بوجوه:

الأوّل: برهن في أوّل¹⁰ **كتاب الأكر** على أنّه إذا ماسّت كرةٌ سطحًا مستويًا فالقطر الخارج من نقطة التماسّ عمود على ذلك السطح،¹¹ ففي زمان بقاء التماسّ بنقطة إمّا أن يتحرّك القطر¹² الخارج منها أو لا يتحرّك؛ فعلى الأوّل لا يبقى/ [١٠٩و] عمودا وإلا يلزم¹³ أن تكون قائمةٌ جزءَ قائمةٍ وقد فُرض عمودًا، هذا خلف؛ وعلى الثاني يلزم انقطاع حركة الدحرجة وقد فُرضت الكرة متدحرجةً، هذا خلف أيضًا.

الثاني: برهن في **الكرة المتحرّكة** على¹⁴ أنّه إذا دارت الكرة دورانًا معتدلًا قطعت جميعُ النقط التي على سطحها من مداراتها¹⁵ المتوازية في الأزمان المتساوية قسيًّا¹⁶ متشابهةً،¹⁷ فلو بقيت التماسّ بنقطةٍ¹⁸ زمانًا،¹⁹ لزم أن تكون نسبة القوس التي تقطعها تلك النقطة في زمان²⁰ معيّن كساعة مثلا إلى مدارها أصغر من نسبة القوس التي تقطعها نقطة أخرى في تلك الساعة إلى مدارها؛ لأنّ نقطة التماسّ²¹ لم تنتقل²² في بعض منها عن موضعه بخلاف البواقي وإن التزم أنّ شيئًا من النقط²³ لا

٩    ل ح: بنقطة.

١٠    ل: أولى.

١١    إنّ هذه القضية هي الشكل الرابع من المقالة الأولى: «كلّ خطّ يخرج من مركز الكرة إلى نقطة التماسّ من سطح يماسّها فهو عمود على ذلك السطح». **تحرير كتاب الأكر لثاوذوسيوس لنصير الدين الطوسي**، ٤.

١٢    ك: قطر.

١٣    ل: ولا يلزم.

١٤    ح – على.

١٥    ك: مناراتها.

١٦    ج: نِسبًا.

١٧    إنّ هذه القضية هي الشكل الثاني من الكتاب: «إذا دارت كرة على محورها دورانًا معتدلًا قطعت جميع النقط التي على سطحها من مداراتها المتوازية في الأزمان المتساوية قسيًا متشابهةً». **تحرير كتاب الكرة المتحرّكة لأوطولوقس لنصير الدين الطوسي**، ٣.

١٨    ل: بنقط.

١٩    ج + ما.

٢٠    ك: زمان.

٢١    ك: التماسّها.

٢٢    ح: لم تنقل.

٢٣    ك: النقطة.

يتحرك حينئذٍ بمشايعة[٢٤] نقطة التماسّ لزم[٢٥] أن لا تتحرّك[٢٦] في جميع أزمان[٢٧] الدحرجة[٢٨] أيضًا؛ إذ ما من جزءٍ منها إلا وهو زمان بقاء التماسّ بنقطةٍ ما، وذلك باطل بديهة.

الثالث: أنّ التماسّ بنقطة معيّنة لو بقيت زمانًا[٢٩] لكانت تلك النقطة لم تفارق موضعها[٣٠] في ذلك الزمان قطعا وليست قطبا[٣١] لحركتها[٣٢] الدورية وإلا لدارت الكرة على نفسها فلم يفارق مكانها وقد فرضت متدحرجة، هذا خلف. فيلزم سكون نقطة في الكرة الدائرة وراء قطبها، وذلك باطل.

الرابع: نرسم دائرةً عظيمةً على الكرة تمرّ بنقطتي التماسّ عليها وعلى خطّ مستقيم من السطح فنقول: إن بقي التماسّ بالنقطة الأولى زمانًا إلى أن تحصل المماسّة بالنقطة الثانية فإن حصل تماسّ آخر بشيءٍ[٣٣] من النقط[٣٤] المفروضة[٣٥] في القوس المحدودة بتينك النقطتين يلزم أن تماسّ الكرةُ السطحَ على أكثر من نقطةٍ وهو باطل؛[٣٦] وإن لم تحصل فإن حاذت[٣٧] تلك القوس ذلك الخطّ والمفروض[٣٨] أنّها لم تمسسه لزم أن لا تكون الكرةُ كرةً أو ذلك السطحُ مستويًا، هذا خلف؛ وإن لم تحاذه لزم إمّا الطفرة أو عدم كون الدحرجة على تلك الدائرة، وهذا أيضًا خلف.[٣٩]

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| ٢٤ | ك: لمتابعة؛ ح: بمسابقة. |
| ٢٥ | ل ك + سكون الكرة فيه؛ ح + سكون الكرة. |
| ٢٦ | ل ح: وإن لا تتحرّك. |
| ٢٧ | ل: زمان. |
| ٢٨ | ك: الدرجة. |
| ٢٩ | ك: زمان. |
| ٣٠ | ل: موضعًا. |
| ٣١ | ل: وليست قطعًا. |
| ٣٢ | ك: بحركتها. |
| ٣٣ | ك: شيء؛ ل: لشيءٍ. |
| ٣٤ | ك: النقطة. |
| ٣٥ | ك: المعروضة. |
| ٣٦ | في هامش ل: كما ثبت في أوّل أُكر ثاوذوسيوس أنّ الكرة لا تماسّ السطحَ المستوي بأكثر من نقطة «منه». |
| ٣٧ | ل: فإن جازت. |
| ٣٨ | ح: فالمفروض. |
| ٣٩ | في هامش ل: وهو مبرهن عليه عندنا تركنا ذكره مخافة التطويل «منه». |

الخامس: كلّ نقطة تفرض بين نقطتي التماسّ في القوس المحدودة بهما⁴⁰ فهي أقرب إلى السطح من نقطة التماسّ الثانية، والأقرب من النقطة الأولى أقرب إلى السطح من أبعدها من تلك النقطة، فما لم يصل⁴¹ الأقرب إلى السطح لا يصل⁴² الأبعد إليه لنزول⁴³ الجميع إلى السطح بحركة واحدة، فلا تبقى نقطة في تلك القوس لا تماسّ السطح، فلا يمكن أن يكون التماسّ بنقاط غير متتالية ويبقى⁴⁴ التماسّ بنقطةٍ⁴⁵ زمانًا، وذلك ما أردناه.

السادس: لو لم تفارق نقاط المماسّة موضعَها زمانًا⁴⁶ لكان النقاط التي⁴⁷ بينها⁴⁸ متمّمَ دورتها / [١٠٩ظ] لحركتها⁴⁹ المستمرّة قبل أن تتمّمها نقاط التماسّ لسكون⁵⁰ كلّ منها في زمان مماسّتها، فيلزم أن لا تتمّم⁵¹ دورتها غير نقاط التماسّ أيضًا وقد فرض أنّها تمّمها، هذا خلف.

السابع: الزاوية التي تحدث بين منطقة الكرة وبين الخطّ المستقيم الذي على السطح لا تقبل التصغّر، أي: لا تفرض بين تلك الدائرة وبين ذلك الخطّ بعينها⁵² زاوية أصغر ممّا حدث أوّلًا، وإلا لكانت⁵³ قائمةٌ جزءَ قائمةٍ، وبقاء نقطة التماسّ مع تحرّك الكرة يستلزم ذلك، هذا خلف.

الثامن: لو بقي التماسّ بالنقطة الأولى إلى⁵⁴ أن يحصل التماسّ بالنقطة الثانية ثمّ زال في آن التماسّ بالنقطة الثانية ففي ذلك الآن إمّا أن تكون بين النقطة الأولى وبين السطح نقطةٌ فقط فيلزم تتالي النقط الثلاث

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٤٠    ل: بها.

٤١    ك: لم يحصل.

٤٢    ك: لا يحصل.

٤٣    ل ح: ليزول.

٤٤    ل ك: وإن يبقى.

٤٥    ل: بنقطةٍ ما.

٤٦    ل: زمانًا ما.

٤٧    ل ك: + تقع.

٤٨    ك: بينها.

٤٩    ك: بحركتها.

٥٠    ح: ليكون.

٥١    ح: أن تتمّم.

٥٢    ل: نفسهما؛ ك: بعينها؛ ح: نعتهما.

٥٣    ج ح ك: كانت.

٥٤    ل – إلى.

من السطح والكرة وما بينهما°° وذلك ظاهر، وإمّا أن تكون أكثر من نقطة فيلزم أن تقطع بعض المسافة في آن، وهو أيضًا محال؛ لوجوب التطابق بين المسافة والحركة والزمان أو لا يكون بينهما بُعد أصلا، فلا يكون التماسّ الأوّل بعدُ زائلا، وقد فُرض زائلا، هذا خلف.

وأمّا الشبهة المشهورة –وهي أنّ الكرة إذا تحرّكت على سطح مستوٍ وقطعته°⁶ من أحد طرفيه إلى الآخر فكلّ نقطة من النقط المفروضة التي تقع المماسّة عليها فيها بين المبدأ والمنتهى تكون حدًّا من حدود°⁷ مسافتها، والمتحرّك ما دام متحرّكا لا يلبث في حدٍ من حدود مسافتها أكثر من آن، كيف وصورة الحركة توسّط بين المبدأ والمنتهى بحيث أيّ حدٍ يفرض فيه المتحرّك في آن لا يكون قبله ولا بعده فيه– فتوضيحه على ما ينبغي يقتضي تمهيد مقدّمةٍ، وهي أنّ القوم قسّموا الحصولَ إلى تدريجي وهو حصول ما له هوية اتّصالية منطبقة على الزمان كالحركة، وإلى غير تدريجي وهو°⁸ إمّا أن يكون حصولا في الآن فقط أو حصولا في الآن والزمان معًا، وإلى حصول في الزمان لا بمعنى الانطباق عليه؛ بل بمعنى أنّه يوجد في كلّ آن يفرض°⁹ في ذلك الزمان لا في طرفه، وقالوا: هذا القسم واسطة بين التدريجي والدفعي المتناول للوجهين المزبورين.

والمحقّق الطوسي حصر الدفعي في القسم الأوّل منه بالمعنى⁶⁰ السابق وجعل⁶¹ القسم الثالث منقسما إلى ما يكون موجودًا في ذلك الزمان وفي طرفه أيضًا وهو القسم الثاني من الدفعي بالمعنى السابق، وإلى ما يكون موجودًا في ذلك الزمان دون طرفه وهذا هو القسم الثالث على التقسيم الأوّل.⁶² ولا مشاحّة في أمثال ذلك؛ ولذلك تراهم يقولون تارةً: إنّ زوال الوصول / [١١٠و] آنيٌّ، وأخرى إنّه زمانيٌّ والمعنى واحد. وقالوا: وصول المتحرّك إلى حدٍّ ما من حدود المسافة دفعي بمعنى الحصول في الآن فقط كما صرّح به الشارح المحقّق في مواضع من كتبه، ولم يبيّنوه⁶³ بما بقي بإثباته⁶⁴ لقربه من الوضوح.

٥٥    ج: وبينهما.

٥٦    ك: وقطعة.

٥٧    ك: جدول.

٥٨    ك – حصول ما له هوية اتّصالية منطبقة على الزمان كالحركة، وإلى غير تدريجي وهو.

٥٩    ل: تعرض.

٦٠    ك: بمعنى.

٦١    ل: وحصل.

٦٢    انظر: الإشارات والتنبيهات (مع شرح نصير الدين الطوسي)، ٣/ ١٦٠-١٦١.

٦٣    ك: ينبّوه.

٦٤    ك: لإثباته.

**أقول:** وبيانه أنّه لو لم يكن الوصول إلى حدّ ما آنيًّا، فإمّا أن يكون تدريجيًّا⁶⁵ فيلزم انقسام حدود⁶⁶ المسافة في امتدادها وهو باطل، أو لا يكون وهو أيضًا باطل سواء كان⁶⁷ حصوله في الآن والزمان معًا أو في الزمان⁶⁸ فقط؛ لأنّه لو استمرّ⁶⁹ الحصول في حدّ زمانًا ما⁷⁰ فإمّا أن لا يكون المتحرّك في ذلك الزمان في شيء من حدود المسافة غيره فيلزم أن يكون ساكنًا فيه وقد فرضنا⁷¹ متحرّكا بعدُ، أو يكون في حدّ آخر أيضًا⁷² فيلزم اجتماع أجزاء الحركة وحدودها في الوجود، وكلاهما محال.

وبوجهٍ آخر لو استمرّ كون المتحرّك زمانًا فإمّا أن يكون زمان سكون وهو خلاف المفروض، أو زمان حركة فإمّا إلى ذلك الحدّ فلا يكون⁷³ بعدُ واصلا إليه وقد فُرض واصلا، أو في ذلك الحدّ فيلزم انقسام حدود المسافة في امتدادها⁷⁴ وهو باطل، أو عن ذلك الحدّ وهو أيضًا باطل؛ لأنّ الحركة عن كلّ مبدأ مفروض عبارة عن التوسّط بينه وبين المنتهى فلا يجمع⁷⁵ مع الكون فيه. وقالوا: زوال الوصول عن⁷⁶ كلّ حدٍّ من المسافة زمانيّ من القسم الثالث⁷⁷ لأنّه لو كان تدريجيًّا لزم انقسام ذلك الحدّ، ولو كان آنيًّا لزم تتالي الآنات وقد تبيّن هذا من آنية الوصول أيضًا.

إذا تمهّد هذا فنقول: إذا تدحرجت الكرة على سطح مستوٍ فكلّ نقطة من نقاط التماسّ الواقع بين مبدأ الدحرجة ومنتهاها حدّ⁷⁸ من حدود⁷⁹ مسافتها، وتماسّ الكرة معها وصولها إليها، وزوال

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٦٥   ك: تدريجًا.

٦٦   ك: الحدود.

٦٧   ج ح ك: كانت.

٦٨   ل: أو الزمان.

٦٩   ك: استمرّ.

٧٠   ح: زماناتها.

٧١   ل: فرضناه.

٧٢   ك – أيضًا.

٧٣   ك: ولا يكون.

٧٤   ك: وامتدادها.

٧٥   ل: فلا يجتمع.

٧٦   ح – ذلك الحدّ وهو أيضًا باطل؛ لأنّ الحركة عن كلّ مبدأ مفروض عبارة عن التوسّط بينه وبين المنتهى فلا يجمع مع الكون فيه. وقالوا: زوال الوصول عن.

٧٧   ك: تدريجًا.

٧٨   ك – حدّ.

٧٩   ك: حدود.

التماسّ بتلك النقطة زوال وصولها عن حدّ معيّن⁸⁰ إلى حدّ آخر. وقد تبيّن ممّا سبق أنّ الحركة على كلّ⁸¹ حدّ لا تجتمع مع الكون فيه فتكون مع الزوال عنه معية زمانية وإن تقدّمت عليه تقدّما ذاتيا فيكون كلّ منها⁸² حاصلا في الزمان دون طرفه الذي هو آن الحصول في المبدأ المفروض، ولا يفرض في ذلك الزمان جزء وآن إلا والحركة وزوال الوصول متحقّقان فيه ويجتمعان في كلّ آن مع الوصول إلى حدّ آخر. وقولهم: زوال الوصول لا يحصل إلا بالحركة والتدريجي⁸³ معناه أنّه متوقّف عليها ومتأخّر عنها تأخّرا ذاتيا، ولا ينافي ذلك كونه حاصلا معها⁸⁴ في جميع زمانها، والتأخّر⁸⁵ الزماني إنّما يلزم أن لو كان تدريجيا بالمعنى الذي سبق، وليس كذلك لما بيّنّا. نعم يتأخّر عن الحركة المؤدية⁸⁶ إلى الوصول / [١١٠ظ] زمانًا لكنّه غير ضائر⁸⁷ في المقصود، فزوال التماسّ بنقطة⁸⁸ أخرى في آن آخر⁸⁹ لكن بمعنى أنّه لا يفرض في آن⁹⁰ الزوال آن إلا ويكون فيه ذلك الزوال مع التماسّ بنقطة أخرى لما مرّ، وكلّ نقطة يجتمع مع التماسّ بها زوال التماسّ بالنقطة الأولى تكون بينها وبين الأولى مسافة تقطعها الكرة فيما بين آنَي التماسّ من الزمان، وعند تلك الحركة لا يبقى ذلك التماسّ الأوّل بل يكون زائلا لما مرّ، فلا يستمرّ التماسّ بأيّ نقطة فرضت إلى آن التماسّ⁹¹ بنقطة أخرى. نعم لو لم يتحقّق زوال التماسّ بالنقطة⁹² الأولى إلا عند التماسّ بنقطة معيّنة أخرى لزم بقاء التماسّ السابق إلى أن يحصل اللاحق، وإنّما يمكن ذلك أن لو كانت للمسافة والزمان حدود معيّنة لا يمكن أن يفرض⁹³ سواها، فظهر أنّ كون زوال التماسّ حاصلا بالحركة والتدريج لا يستلزم بقاء التماسّ في زمان الحركة بل هو معها زمانا، فيتمّ المطلوب.

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٨٠    ل + من مسافتها وتماسّها بنقطة أخرى وصولها؛ ح – عن حدّ معيّن من مسافتها.

٨١    ل ك: عن كلّ.

٨٢    ح: منهما.

٨٣    ل: والتدريج.

٨٤    ج ح: معه.

٨٥    ك: والتأخير.

٨٦    ج – المؤدية.

٨٧    ل: غير جائز.

٨٨    ل + وإن كان لا يحصل إلا عند التماسّ بنقطة.

٨٩    ك – آخر.

٩٠    ل: في زمان.

٩١    ل ك ح: تماسّ.

٩٢    ك: بنقطة.

٩٣    ل: أن يعرض.

**أقول:** وبهذا يندفع ما يتوهّم⁹⁴ من أنّ كلّ نقطة تفرض⁹⁵ على الكرة سوى نقطة التماسّ بينه وبين السطح بُعدٌ ما قطعا، ولا يزول التماسّ بالنقطة إلا عند حدوث الثانية ولا تحدث المماسّة بالنقطة الثانية إلا بعد قطع بُعدها⁹⁶ عن السطح فتبقى المماسّة في زمان ذلك القطع، وإلا يلزم خلوّ الدحرجة عن المماسّة؛ إذ قد ظهر أنّ زوال المماسّة لا يحدث في الآن، فلا يصحّ قوله: ولا يزول التماسّ بالنقطة الأولى إلا عند حدوث الثانية وإنّ الزمان المفروض بعض من زمان⁹⁷ زوال التماسّ لكونه محدودًا بآنَي المماسّتين، فلا يكون زمان بقاء مماسّة⁹⁸ الأولى، ففي الآنات المفروضة في ذلك الزمان تحصل المماسّة بالنقاط المفروضة بين تينك النقطتين، فلا تكون المماسّة الأولى باقية في ذلك الزمان بل زائلة. وأيضًا يندفع ما اشتبه⁹⁹ على بعض الفضلاء من أنّ تحقّق الحركة بمعنى التوسّط في أيّ حدٍ من حدود المسافة وفي أيّ آن؛ إذ لا تتحقّق في المبدأ لما مرّ، ولا في شيءٍ من حدود المسافة، وإلا يلزم أن يكون الوصول إلى ذلك الحدّ عن المبدأ بدون الحركة؛ لأنّه لما تبيّن أنّ من الحصول قسمًا يتحقّق في الزمان دون طرفها وأنّ حصول الحركة من هذا¹⁰⁰ القبيل تبيّن أنّه ليس في زمان الحركة آن يتعيّن لحدوثها؛¹⁰¹ لأنّ كلّ حدّ يفرض فيه يمكن أن تفرض بينه وبين طرفيه حدود غير متناهية تتحقّق الحركة في كلّ منها لاتّصال الزمان وقبولها التجزئة إلى غير النهاية، وكذا ليس في المسافة حدٌّ متعيّن كذلك لتطابقها مع الزمان وقبولها القسمة كذلك. ولمّا ثبت أنّ ما به التماسّ لا يمكن أن تكون نقاطًا¹⁰² متالية فلنفحص الآن عن أنّه بماذا يقع حال الدحرجة¹⁰³ فنقول: / [١١١و] لا يمكن أن يقع التماسّ بنقاط متالية وإن تحقّقت واحدًا بعد واحد حسب تجدّد التماسّ وانصرامه ولم يوجد متالية مترتّبة؛ لأنّه يوجب جواز توهّم النقاط المتالية، وكذا يستلزم تتالي

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٩٤    ل: تُوُهّم.

٩٥    ل: تعرض.

٩٦    ل: بعد ما.

٩٧    ك – زمان.

٩٨    ل: المماسّة.

٩٩    ل: وأقول: بهذا يندفع أيضًا ما يشتبه.

١٠٠    ك: هذه.

١٠١    ك: بحدوثها.

١٠٢    ل: غير.

١٠٣    في هامش ج ل ك: فتبيّن بهذا فساد ما قاله الشريف العلّامة في مباحث الحركة من هذا الكتاب من أنّ الحركة بمعنى التوسّط يوجد في الآن ويستمرّ زمانًا كالبياض «منه سلّمه الله» ⁽¹⁾ | ⁽¹⁾ ك: رحمه الله.

الآنات، وكلّ منها كافٍ في إثبات الجزء ولا أن يقع مع نقطة سيّالة شخصيته[104] مستمرّة من أوّل الدحرجة[105] إلى منتهاها يتبدّل[106] في كلّ[107] آن بعض عوارضها الفرضية مع بقاء ذاتها بشخصها كما تُراءى[108] من جواب الشبهة العامة؛ لأنّ ذلك يوجب حركة النقطة بذاتها، وهو محال. وذلك في نقطة التماسّ من السطح أظهر[109] منه في نقطة التماسّ من الكرة، وإن لزم المحذور فيهما معًا، ولا أن يكون[110] بخطّين قارّين أحدهما مستدير والآخر مستقيم؛ إذ لا خطّ في الكرة والسطح بالفعل، ولا يكون التماسّ سببًا لحدوثهما فيهما؛ إذ نحن نعلم يقينًا أنّ ما به الماسّة بعد زوالها كحالها قبل وقوعها، فلا خطّ بالفعل بعدها كما لم يكن قبلها. وإذا بطل تلك الاحتمالات تعيّن أن يكون بخطّين غير قارّين وهذا هو الظاهر؛ لأنّ التماسّ لمّا كان سببا لحدوث أمر لم يكن بله وكان حركة الكرة التي تتبعها التماسّ أمرًا متّصلا واحدًا في نفس الأمر لا جزء فيه بالفعل غير قارّ لا تجتمع أجزاؤها في الوجود يجب أن يكون ما به التماسّ أيضًا كذلك، وما هو إلا الخطّ الغير القارّ.

والشيخ أورد في **الشفاء** فصلا طويل[111] الذيل لإثبات أنّ الحركة والزمان متّصلان ليس لهما أوّل جزء ليثبت أنّ ما به التماسّ حال الحركة أمر متّصل لا يحصل بأوّل جزء منها بأوّل جزء[112] منه حتّى يكون نقطة، وكان ذلك بعد أن قال:

«ليس يلزم أن تكون الكرة مماسّة للسطح والخطّ في أيّ حال كان بالنقطة لا غير[113] بل تكون في حال الثبات والسكون كذلك. فإذا تحرّكت ماسّت بالخطّ[114] في زمان الحركة ولم يوجد وقت بالفعل تماسّ فيه بالنقطة إلا في الوهم؛ إذ ذلك لا يُتوهّم إلا مع توهّم[115] الآن، والآن لا وجود له بالفعل.»[116]

١٠٤    ح: شخصية.

١٠٥    ل: الدرجة.

١٠٦    ك: بتبدّل.

١٠٧    ل – كلّ.

١٠٨    ل ك: يتراءى.

١٠٩    ك: الظاهر.

١١٠    ل: ولا أن لا يكون.

١١١    ك: طويلا.

١١٢    ك – ليثبت أنّ ما به التماسّ حال الحركة أمر متّصل لا يحصل بأوّل جزء منها بأوّل جزء.

١١٣    ك: يميز.

١١٤    ح – ماسّت بالخطّ في زمان الحركة.

١١٥    ح: توهّم.

١١٦    الشفاء – الطبيعيات – ١ -السماع الطبيعي لابن سينا، ص٢٠١.

ولا يتوهّمنّ أنّ هذا الجواب إنّما يتأتّى بعد انتفاء الجزء، وليس الكلام إلا فيه؛ لأنّه يكفي الحكيم أن يقول: لِمَ لا يجوز أن يكون ما به التماسّ حال الحركة أمرًا متّصلا غير قارّ كالحركة؟ غاية ما[117] في الباب أن يكون اعتقاده على أنّ هذا[118] الاحتمال هو الواقع.

**أقول**: في هذا الجواب إشكالان.

الأوّل: أنّ وجود مثل هذا الأمر الغير القارّ غير معقول كما بيّنه الشريف المحقّق أخذا من كلام الإمام في **شرحه للإشارات**. كيف ولو جاز ذلك لجَاز[119] وجود[120] الحركة بمعنى القطع والزمان مع أنّ الشيخ أيضًا / [١١١ظ] نفاه في **الشفاء** حيث قال:

> «الحركة إن عُني بها الأمر المتّصل المعقول للمتحرّك بين المبدأ والمنتهى، وذلك لا يحصل ألبتّة[121] للمتحرّك وهو بين المبدأ والمنتهى بل إنّما يظنّ أنّه قد حصل نحوا من الحصول إذا كان المتحرّك عند المنتهى. وهناك يكون هذا المتّصل المعقول[122] قد بطل من حيث الوجود فكيف يكون له حصول حقيقي في الوجود بل وهذا الأمر في الحقيقة ممّا لا ذات له قائمة في الأعيان.»[123]

والثاني: أنّه كما أنّ للكرة تماسًّا مع الخطّ[124] في زمان حركتها عليه، كذلك لها مماسّة معه في كلّ آن يفرض في ذلك الزمان. وكما أنّه يجب أن يكون ما به التماسّ في الزمان موجودًا، كذلك يجب أن يكون ما به التماسّ في الآن موجودًا، وذلك ليس[125] إلا النقطة، فيجب أن توجد في ذلك الخطّ الغير القارّ نقاط غير متناهية مترتّبة في الوضع بحسب نفس الأمر مع كونه محصورًا بين حاصرين، وذلك محال متتالية كانت أو لا.

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١١٧   ك – ما.

١١٨   ك: هذه.

١١٩   ك: لما جاز.

١٢٠   ح: حدود.

١٢١   ل: إليه.

١٢٢   ك – نحوا من الحصول إذا كان المتحرّك عند المنتهى وهناك يكون هذا المتّصل المعقول.

١٢٣   **الشفاء – الطبيعيات – ١ -السماع الطبيعي لابن سينا**، ص٨٣-٨٤.

١٢٤   ل: مع السطح.

١٢٥   ح: ليس فيه.

**قوله:** «ولم يكن ألبتّة وقت بالفعل يماسّ فيه بالنقطة إلا في الوهم؛ إذ ذلك لا يُتوهّم إلا مع توهّم الآن والآن لا وجود له بالفعل.¹²⁶»

**قلت:** وقوع التماسّ في الآن بحسب نفس الأمر كافٍ في إثبات تلك النقطة، سواء كان الآن موجودًا أو¹²⁷ لا، كما أنّ وقوع التماسّ في زمان الحركة يكفي في إثبات ذلك الخطّ، ولا يضّر بذلك كون الزمان أو الحركة¹²⁸ موهومًا.

**لا يُقال:** مثل هذا الإشكال وارد على خطّ¹²⁹ يمكن أن تفرض فيه نقاط غير متناهية.

**قلت:** الوهم لا يقدر على استحضار¹³⁰ أمور غير متناهية فيكون ما يخرج بسببه من القوّة إلى الفعل أمورًا¹³¹ متناهيةً أبدا. وأمّا العقل فلا يدرك¹³² تلك النقاط الغير المتناهية إلا على وجه كلّي شامل للجميع، فلا يخرج¹³³ بفرضه من القوّة إلى الفعل أمور غير متناهية حيث ما بُيّن في مظانّه.¹³⁴ وأمّا في مبحثنا هذا فلمّا كان التماسّ¹³⁵ في الآن سببًا لوجود¹³⁶ النقطة في الخارج وكان التماسّات¹³⁷ الآنية غير متناهية بحسب لا تناهي الآنات كانت النقط الموجودة في الخارج أيضًا غير متناهية.¹³⁸

**أقول:** الجواب الحقّ الذي لا محيد¹³⁹ عنه يقتضي تمهيد مقدّمة هي أنّ مبنى هذا الدليل وكثير من دلائلهم على ثبوت الجزء على أنّ ما به التماسّ يجب أن يكون موجودًا في الخارج، وليس كذلك. وما ذكروا¹⁴⁰ في إثباته من أنّه لا شبهة في أنّ الأجسام موجودة وأنّها تتماسّ بأمور موجودة منقسمة

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١٢٦    الشفاء – الطبيعيات – ١ – السماع الطبيعي لابن سينا، ص٢٠١.

١٢٧    ل: أم.

١٢٨    ل: والحركة.

١٢٩    ل: على كلّ خطّ.

١٣٠    ل: استحصال.

١٣١    ل: أمور.

١٣٢    ل: ولا يدرك.

١٣٣    ل: ولا يخرج.

١٣٤    ل: مظانّه.

١٣٥    ل – التماسّ.

١٣٦    ك: بوجود.

١٣٧    ك ح: التماسّان.

١٣٨    ك – بحسب لا تناهي الآنات كانت النقط الموجودة في الخارج أيضًا غير متناهية.

١٣٩    ل ك: لا مجيد.

١٤٠    ك: وما ذكر.

في العَرْض¹⁴¹ دون العمق، وإلا لزم¹⁴² التداخل بين المنقسمين في العمق أو كون التماسّ بجزئين

بينهما¹⁴³ لا بها، فننقل الكلام إلى ذينك الجزئين وعدم انقسامهما،¹⁴⁴ ولا يتسلسل بل ينتهي إلى

ما لا ينقسم في العمق، وذلك هو السطح فثبت وجوده؛ ثمّ إنّ السطحين الموجودين يتماسّان على

أمر منقسم¹⁴⁵ في الطول دون العرض / [١١٢و] وإلا لزم أحد الأمرين كما عرفت، وذلك هو

الخطّ، فثبت وجوده أيضًا؛ ثمّ إنّ الخطّين الموجودين يتماسّان على أمر ذي وضع لا ينقسم أصلا

وهو النقطة،¹⁴⁶ منظور فيه؛ لأنّه إن أريد بالأمور الموجودة التي بها يقع التماسّ المفروض الأولى

للتماسّ فنختار أنّها ذوات الأجسام المنقسمة في الجهات.

قوله: «وإلا لزم التداخل» ممنوع وإنّما يلزم ذلك أن لو كان التماسّ¹⁴⁷ عارضًا لكلّ واحد من

الأجزاء أو لبعضها.¹⁴⁸ لِمَ لا يجوز أن يفرض للجميع من حيث هو جميع دون كلّ واحد من الأجزاء

أو لبعضها؟¹⁴⁹ وبالجملة كما يعرض السطح للجسم من حيث هو جسم لا بجميع¹⁵⁰ أجزائه أو

لبعضه ولا يلزم من انقسام الجسم في الجهات انقسامَ السطح فيها، لكونه ساريًا في الجهتين دون

الجميع، كذلك يمكن أن نفرض¹⁵¹ التماسّ للجسم من حيث هو لا بجميع¹⁵² الأجزاء أو لبعضها

حتّى يلزم أحد المحذورين المذكورين. وهكذا نقول في تماسّ السطوح بالخطوط، والخطوط بالنقط

لا بدّ لنفي ذلك من دليل، وتعيين¹⁵³ بعض جهات الجسم للتماسّ في الإشارة الحسّية لا ينافي عروض

التماسّ له؛ لأنّ ذلك إنّما نشأ من سريانه في بعض جهات الجسم دون البعض كما في الأطراف، فإنّه

يعيّن لها أيضًا بعض جهاته في الإشارة الحسّية لسريانها في تلك الجهة دون غيرها من الجهات.

١٤١   ل + والطول.

١٤٢   ك: يلزم.

١٤٣   ل: بين منهما.

١٤٤   ل: انقسامها.

١٤٥   ل: ينقسم.

١٤٦   انظر: كتاب **المواقف** (مع شرحه للجرجاني) للإيجي، ٢/ ٣٣٧.

١٤٧   ك: – الأجسام المنقسمة في الجهات. قوله: «وإلا لزم التداخل» ممنوع وإنما يلزم ذلك أن لو كان التماسّ.

١٤٨   ك: وبعضها، ح: ولبعضها.

١٤٩   ل: أو بعضها.

١٥٠   ل: لا لجميع.

١٥١   ل ك ح: يعرض.

١٥٢   ل: لا لجميع.

١٥٣   ل + العقل.

**وأقول:** إذا أريد¹⁵⁴ بها به¹⁵⁵ التماسّ المفروض الأولى للتماسّ ولم يتوجّه هذا المنع على الدليل لزم من ثبوت سطح في الجسم ثبوتَ سطوح غير متناهية كلَّ منها معروض لآخر أو الانتهاء إلى سطح جوهري؛ لأنّا نقول: معروض السطح لا يمكن¹⁵⁶ أن يكون أمرًا منقسماً في جميع الجهات، وإلا لزم انقسام السطح في الجهات أو كون المعروض بعض أجزاء ما فُرض معروضًا ونقل الكلام إليه ولا يتسلسل بل ينتهي إلى ما ينقسم في جهتين¹⁵⁷ فقط، فيكون سطحًا. وهكذا نقول في ذلك السطح أيضًا فيتسلسل أو ينتهي إلى سطح جوهري.¹⁵⁸ وكذا الحال في الخطّ والنقطة¹⁵⁹ وإنّه محال. وإن أريد بها به التماسّ الواسطة في ثبوت التماسّ لمعروضه نختار أنّه ليس جسمًا ولا جزئه ولا أمرًا¹⁶⁰ موجودًا في الخارج قائما بالجسم، بل الواسطة فيه كون الجسم بحيث¹⁶¹ يمكن أن يفرض¹⁶² فيه سطح حتّى لو لم يكن بهذه¹⁶³ الحيثية لم يعرض له التماسّ. وقس عليه تماسّ السطحين بالخطّ والخطّين بالنقطة. وكون اتّصاف الجسم أو أمر آخر بالأمور الاعتبارية في نفس الأمر أو كونه بحيث يمكن أن نتوهّم فيه بعض الأمور توهّمًا صادقًا مطابقًا لما¹⁶⁴ في نفس الأمر سببًا لعروض الأمور الموجودة في الخارج له غير عزيز. ألا يرى أنّ عروض الضوء لوجه الأرض إنّما هو بسبب¹⁶⁵ محاذاته للأجرام / [١١٢ظ] النيّرة، وعروض الألوان المتخالفة والأضواء المتخالفة لجسم واحد متّصل إنّما هو لكونه بحيث يمكن أن يتوهّم¹⁶⁶ فيه شيء غير شيء توهّمًا صادقًا حتّى لو لم يكن الجسم بهذه الحيثية لم يعرض له تلك الأشياء المتضادّة في آن واحد على أنّ التماسّ ليس من الموجودات الخارجية بل من الإضافات المختصّة بذوات الأوضاع.

١٥٤ ك: إذا أراد.
١٥٥ ل: به؛ ك: ما به.
١٥٦ ل: يمكن.
١٥٧ ك: الجهتين.
١٥٨ في هامش ك: هذا بيان لزوم السطوح الغير المتناهية أو الانتهاء إلى سطح جوهري.
١٥٩ ل: والنقط.
١٦٠ ك: أمر.
١٦١ ل: يجيب.
١٦٢ ل: يعرض.
١٦٣ ل: بهذا؛ ح: لهذه.
١٦٤ ك: بما.
١٦٥ ل: لسبب.
١٦٦ ل ك: يتوهّم.

**وأقول:** ليت شعري أنّ من يقول بأنّ ما به المماسّة يجب أن يكون موجودًا في الخارج لم يقول¹⁶⁷ بوجود ما به المحاذاة في الخارج أيضًا مع جريان الدليل فيه بأدنى تغيير؟ نعم قد يقع التماسّ بين الأطراف¹⁶⁸ إذا كانت¹⁶⁹ موجودة قبله، ولا نزاع لنا فيه، وإنّما النزاع في أنّ التماسّ هل يقتضي وجودها بعد أن لم يكن أوّلًا؟

وإن أخذوا تلك المقدّمة إلزامية فنقول: ما ذُكر في معرض الدليل تنبيه على وجود الأطراف، لا أنّه¹⁷⁰ دليل عليه، ويؤيّد ما ذكرنا¹⁷¹ قول الشارح¹⁷² في **حواشيه على شرح التجريد**: «الجسم إذا انتهى في أحد امتداداته فقط¹⁷³ كان هناك أمر ممتدّ في الجهتين¹⁷⁴ بالضرورة، والسطح إذا انتهى في أحد امتداداته كان هناك أمر ممتدّ¹⁷⁵ في جهة واحدة بالضرورة¹⁷⁶» وكون ما به التماسّ موجودًا بالفعل إنّما هو بمعنى التعيّن¹⁷⁷ والتميّز عند العقل. نعم قد جعلوا¹⁷⁸ ثبوت الأجسام التعليمية استدلاليًّا لكن أين هذا من ذاك.¹⁷⁹

وقال في **المحاكمات** بعد أن بالغ في أنّ اختلاف الأعراض لا يوجب قسمة خارجية في الأجسام: «والمراد من الفعل ليس فعل الوجود في الأعيان¹⁸⁰ بل ما هو أعمّ.»¹⁸¹ وظاهر أنّ اختلاف الأعراض كما لا يوجب الانفصال في الخارجي¹⁸² في الأجسام كذلك لا يوجبه في الأطراف.

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١٦٧    ك: لا يقولون.

١٦٨    ك: من الأطراف.

١٦٩    ل: وإذا كانت.

١٧٠    ك: إلا أنّه.

١٧١    ك ح: ما ذكر.

١٧٢    ل + قُدّس سرّه.

١٧٣    ك – فقط.

١٧٤    ل: في جهتين؛ ك: الجهتين.

١٧٥    ل: أمرًا ممتدًا.

١٧٦    انظر: حاشية على شرح التجريد للجرجاني، ٢٢٠ظ.

١٧٧    ح: التعيين.

١٧٨    ل: جعلوا.

١٧٩    ك: من ذلك.

١٨٠    ك ح: في أعيان.

١٨١    **الإشارات والتنبيهات مع شرح الخواجه نصير الدين الطوسي والمحاكمات لقطب الدين الرازي**، ٢/ ٤٧.
         ولاعتراض الرازي انظر: **المطالب العالية**، ٦/ ٤٤–٤٥.

١٨٢    ل: في الخارج.

وقال في دليل تخلّل السكون بين كلّ حركتين مستقيمتين:

وأورد الإمام النقض بمماسّة كلّ كوكب بنقطة¹⁸³ معيّنة من الفلك المحيط بفلكه،¹⁸⁴ كما إذا كان في ذروة¹⁸⁵ التدوير على أوج حامله أو في حضيض التدوير وحضيض حامله، وبوصول الكواكب¹⁸⁶ إلى الأوج والحضيض ومسامتتها¹⁸⁷ بنقطة¹⁸⁸ الاعتدال. وهذه النقوض أيضًا بحدود مفروضة.¹⁸⁹

وهذا صريح في أنّ نقطة التماسّ غير موجودة في الخارج كنقطة المسامتة.¹⁹⁰

وقال الشيخ في طبيعيات الشفاء: «إنّ الحدود في المتّصل ليست بموجودة¹⁹¹ بالفعل بل بالقوّة، وإنّما تصير بالفعل إمّا بقطع وإمّا بموافاة محدودة كمماسّة أو موازاة وإمّا بفرض.»¹⁹² ومن البيّن أنّ ليس الفرض والموازاة سببًا لوجود الحدود في الخارج بالفعل¹⁹³ بل في الوهم، وكذلك المماسّة وأمثالها. فتبيّن¹⁹⁴ أنّهم إن قالوا بوجود نقطة التماسّ بالفعل إنّما يريدون به الوجود في العقل والفعلية عند الوهم.

/ [١١٣ و] ولمّا وضح أنّ تلك المقدّمة التي يبنون دلائلهم عليها لا يمكن أن تؤخذ برهانية ولا إلزامية.

**فأقول:** إذا ماسّت الكرة سطحًا مستويًا فالتماسّ في الحقيقة ليس إلا لسطح¹⁹⁵ الكرة بنفس ذلك السطح المستوي، لكن تتعيّن بسببه نقطتان منهما عند الوهم كتعيّن بعض الحدود ببعض الأعراض الأخر وبعض أجزاء الجسم¹⁹⁶ بما حلّ فيه. ثمّ إذا تدحرجت عليه فإنّما تماسّ في زمان¹⁹⁷ الدحرجة

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١٨٣   ل: لنقطة.

١٨٤   ل: لفلكه.

١٨٥   ك: ذروّة.

١٨٦   ل: الكوكب.

١٨٧   ح: ومسامتها.

١٨٨   ل: لنقطة.

١٨٩   الإشارات والتنبيهات مع شرح الخواجه نصير الدين الطوسي والمحاكمات لقطب الدين الرازي، ٣/ ١٩٩.

١٩٠   ل + فيه.

١٩١   ل: موجودة.

١٩٢   الشفاء – الطبيعيات – ١ –السماع الطبيعي لابن سينا، ص٩١.

١٩٣   ل: بل الفعل.

١٩٤   ك: وتبيّن.

١٩٥   ح: إلا سطح.

١٩٦   ل + المتّصل.

١٩٧   ك – زمان.

أيضًا بنفس السطحين، لكن يتعيّن ويتميّز في الوهم بسببها¹⁹⁸ خطّ مستدير¹⁹⁹ في الكرة ومستقيم في السطح المستوي، وكذلك يتعيّن في كلّ آن يفرض من ذلك²⁰⁰ نقطتان²⁰¹ من ذينك الخطّين، فكما لا يمكن أن يفرض آنان إلا وبينهما زمان، كذلك لا يمكن أن يتوهّم نقطتان إلا وبينهما خطّ، فيكون حال الكرة والسطح عند التماسّ كحالهما²⁰² قبله. غايته أنّ لتوهّم²⁰³ تلك النقاط في تلك الحالة باعثا لم يكن قبلها، وسبب توهّم الخطّين عند الدحرجة دون النقاط المتتالية،²⁰⁴ اتّصال²⁰⁵ الحركة والزمان.

وهذا الجواب لا ينافي ما نُقل عن الشيخ في **الشفاء**، فإنّه قال: «فإذا تحرّكت²⁰⁶ ماسّت بالخطّ في زمان الحركة.»²⁰⁷ وهذه العبارة لا تدلّ على وجود ذلك الخطّ؛²⁰⁸ لأنّا بيّنّا أنّ المراد بما به التماسّ ما بسبب²⁰⁹ صحّة توهّمه في الجسم يقع التماسّ، فالباء للسببية لا للصلة، أو يسندون التماسّ إلى سببه ويصفونه²¹⁰ به توسّعًا كما يقولون²¹¹ للأطراف الموهومة ما به المحاذاة. ومن البيّن أنّ ااة أمر لآخر²¹² في الخارج لا يكون إلا مع وجود كلّ منهما كالمماسّة، فليس المحاذاة بتلك الأطراف حقيقة، وإنّما يطلقونه عليها²¹³ بأحد المعنيين المذكورين.

وقوله: «ولم يوجد ألبتة وقت بالفعل يماسّ فيه بالنقطة إلا في الوهم.»²¹⁴ صريح فيما ذكرنا، ولا اختصاص لذلك بحال الحركة بل في حال السكون أيضًا كذلك. نعم سياق الكلام يقتضي أن يكون

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١٩٨ ح: بسببهما.

١٩٩ ج ح: مستوٍ.

٢٠٠ ل ك + الزمان.

٢٠١ ل: بنقطتين.

٢٠٢ ل: كحالها.

٢٠٣ ك: أن يتوهّم.

٢٠٤ ل: والمتتالية.

٢٠٥ ح: لاتّصال.

٢٠٦ ك: إذ الحركة.

٢٠٧ **الشفاء – الطبيعيات – ١ –السماع الطبيعي لابن سينا، ص٢٠١.**

٢٠٨ ل – الخطّ.

٢٠٩ ل: المراد بما به التماسّ بالسبب.

٢١٠ ج ك: ويصفون.

٢١١ ك: لما يقولون.

٢١٢ ح: للآخر.

٢١٣ ل: عليها.

٢١٤ **الشفاء – الطبيعيات – ١ –السماع الطبيعي لابن سينا، ص٢٠١.**

التماسّ بخطٍّ في نفس الأمر وبالنقطة بحسب التوهّم، إلا أنّ الفحص البليغ أوجب أن يكون التماسّ للسطحين في الزمان كما في الآن. كيف وكون التماسّ للخطّين في الزمان يستلزم وجودهما في الآن وذلك محال لما مرّ، والتماسّ في الآن إمّا أن يمنع بالكلّية ويقال: ليس فيه تماسّ بحسب الواقع بل في الوهم، فلا يتحقّق في شيءٍ من آنات زمان الدحرجة، فلا يتحقّق في ذلك الزمان أيضًا؛ لأنّ التماسّ ليس زمانيًا بمعنى التدريجي بل هو من الآنيات²¹⁵ المستمرّة في الزمان كالوصول إلى المنتهى فيكون زمانيًا بمعنى أنّه لا يفرض²¹⁶ في ذلك²¹⁷ آن إلا وهو حاصل فيه. نعم تماسّ الخطّين تدريجي لا يتحقّق في الآن على فرض وقوعه، وليس النزاع في ذلك / [١١٣ظ] بل في تماسّ الكرة مع السطح. ولا شكّ أنّه إنّما حصل²¹⁸ عند انقطاع حركة الكرة المؤدية إلى التماسّ مع السطح،²¹⁹ ثمّ استمرّ ما دامت الكرة عليه؛ أو يقال:²²⁰ إنّه واقع فيه بالنقطتين، فيلزم تحقّق النقاط الغير المتناهية وذلك باطل كما مرّ؛ أو يقال: إنّه واقع فيه بذينك²²¹ الخطّين، فيلزم التماسّ بالمعدوم؛ إذ لا تحقّق لهما في الآن؛ أو يقال: إنّه واقع بالسطحين²²² فثبت المطلوب، ولا يحتاج إلى إثبات الخطّين للتماسّ في الزمان.

**أقول:** ويمكن تطبيق ذلك بما نقله الشارح عن ابن سينا في الجواب، وقد ذكره في **تعليقاته**، فيتمّ من غير قصور، فيكون الجواب حينئذٍ²²³ عمّا أورده الشارح قُدّس سرّه²²⁴ بقوله: «لا يقال»: إنّ المماسّة في حال الحركة بالسطح كما في حال السكون، لكن كلّما يفرض آن في زمانها²²⁵ يتغيّر²²⁶ ولا يحتاج إلى ما ارتكب به الشارح قُدّس سرّه²²⁷ في الجواب عمّا أورده بقوله:²²⁸ «لا يقال».

٢١٥ ل: من الأينات؛ ك: من الآنات.
٢١٦ ك: لا يعرض.
٢١٧ ل + الزمان.
٢١٨ ل: إنّما يحصل.
٢١٩ ك – ولا شكّ أنّه إنّما حصل عند انقطاع حركة الكرة المؤدية إلى التماسّ مع السطح.
٢٢٠ ك: ويقال.
٢٢١ ل: لذينك.
٢٢٢ ك: في السطحين.
٢٢٣ ك – حينئذٍ.
٢٢٤ ك – قُدّس سرّه.
٢٢٥ ح: زمانهما.
٢٢٦ ل: بتعيّن.
٢٢٧ ك – قُدّس سرّه.
٢٢٨ ل: لقوله.

ثمّ²²⁹ قال صاحب **المواقف**: «إنّا نفرض²³⁰ خطًّا قائمًا على خطٍّ ويمرّ عليه، فإنّه يماسّ في مروره جَميعَ أجزاءِ ذلك، والمماسّة إنّما تكون بنقطة، فالخطّ الممرور²³¹ عليه مركّب من نقط، والسطح من خطوط، والجسم من سطوح.»²³²

وقال الشارح المحقّق قُدّس سرّه: «ويتّجه عليه أنّ المتحرّك هو المتحيّز بالذات، ولا بدّ أن يكون²³³ منقسمًا في جميع الجهات كما سيأتي، والسطح والخطّ والنقطة لا تكون إلا أعراضًا فكيف تُتصوّر حركة خطٍّ عرضي على آخر مثله.»²³⁴

**أقول:** لا يتوقّف غرض المصنّف على أنّ الخطّ متحيّز بالذات فإنّ قيام خطّ على آخر ومروره عليه بواسطة موضوعه متصوّر بل واقع،²³⁵ وذلك كافٍ في مقصوده. فأيّ حاجة له إلى إثبات تحرّكه بالذات، فإنّا وضعنا²³⁶ طرف خطّ من المكعّب على آخر مثله²³⁷ وحرّكنا المكعّب بحيث يمرّ طرف الخطّ²³⁸ على ما وُضع عليه أو وضعنا رأس مخروط على خطّ أو سطح ثمّ أمررناه²³⁹ عليه أو وضعنا الكرة على السطح وأمررناها عليه من غير أن يتدحرج²⁴⁰ يظهر²⁴¹ ما ادّعاه، وقس عليه حركة الخطّ²⁴² على السطح، وكان الملائم للشارح أن يجيب عنه بما أجاب به عن مثله: ليس التماسّ²⁴³ إلا بنقط²⁴⁴ غير متتالية، فكأنّه إنّما هرب عنه لكون فساده ههنا أظهر. والجواب الحقّ ما مرّ ذكره فلا نعيده.

تمّت الرسالة بعون اللّٰه الملك الوهّاب

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٢٢٩   ل – ثمّ.

٢٣٠   ل: إنّما.

٢٣١   ك: في الخطّ الممرور.

٢٣٢   كتاب **المواقف** (مع شرحه للجرجاني) لعضد الدين الإيجي، ٢/ ٣٣٢.

٢٣٣   ل: ولا بدّ وأن يكون.

٢٣٤   كتاب **المواقف** (مع شرحه للجرجاني) لعضد الدين الإيجي، ٢/ ٣٤١.

٢٣٥   ك: بالواقع.

٢٣٦   ل ح: إذا وضعنا.

٢٣٧   ل: على أنّ مثله.

٢٣٨   ل – الخطّ.

٢٣٩   ك: أمررنا.

٢٤٠   ك: أن يتدحرجه.

٢٤١   ل – يظهر.

٢٤٢   ل – الخطّ.

٢٤٣   ل: ليست تماسّ.

٢٤٤   ك: إلا بنقطة.

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## D. Translation

# TREATISE ON THE INDIVISIBLE PART
## Mu'ayyadzāda 'Abd al-Raḥmān Efendi

*In the name of Allah, the Most Compassionate and Most Merciful.*
*From Him we ask for help.*

The author of *al-Mawāqif* [al-Jurjānī] said in the "Chapter on the Indivisible Part": "Let's assume that a sphere is touching a flat surface. What makes contiguity is not divisible; otherwise, it is either divided in one direction, which is the line, or in many directions, which is the surface. But in this case, the sphere is not a sphere. We also assume that all parts roll into contact with the surface, and in that case, all parts will be undivided."

The *shāriḥ*, *muḥaqqiq*, and scholar [al-Jurjānī], May Allah make a good treat in heaven, said: "Ibn Sīnā replied to this: 'When the sphere touches the surface at some point, it may come into contact with a divisible time and a divisible movement at another point. Also, this point is not adjacent and contiguous to the first [one], for if it were it would overlap with it because continuity between two indivisible things can only ocur through the entire overlap between two touchpoints. This is the case for other points between which contiguity took place. Thus, neither the sphere's perimeter nor the flat surface are compounds of [those] points that follow each other.'"

[Ibn Sīnā:] "It can not be said: 'According to this, contiguity on the other point will only occur after movement, and in the state of motion there will be contiguity. So, if the contact happens at the first point, then the sphere rests in the time of motion. If the contact is at a moderate point between the two points, then there is a situation that will reverse the assumed provision, and we [will] carry on the debate to this midpoint. Then, in this case there must be no vehicles between the two points of contiguity, which requires that the points come in succession.'" Because we say: "Even though the contiguity on the first point occurs at one time, it keeps continuing its succession during the time of the rolling motion, which leads to contact at another point. The first contact is eliminated as soon as this second contact is realized. So, every contact that happens on a single point both occurs and

continues to exist at a single instant. This situation is not contrary to the sphere's continuous movement, as it is clearly understood from the correct imagination.

[Mu'ayyadzāda:] I say: "The continuity of touch at one point is invalid (*bāṭil*) in terms of following directions."

First: It was proved in the first article of *Kitāb al-Ukar* that when the sphere comes into contact with a flat surface, the diameter (*quṭr*) resulting from the touchpoint is vertical to this surface. This diameter either moves or does not move at the time of the contact's continuation at one point. In the first case, this diameter cannot remain vertical or a right angle should be part of another right angle, because the diameter was assumed to be vertical. Therefore, this is a contradiction. In the latter case, the rolling motion should be interrupted. However, it was assumed that the sphere was rolling, and so this is also a contradiction.

Second: It was proved in the work of *al-Kurat al-Mutaḥarrika* that when a sphere returns at constant velocity (*mu'tadil*), all of the points on its surface form proportional arcs to each other in equal time and in corresponding parallel orbits. If the contact that occurred at some point had continued in time – for example, at a certain time like an hour – then the relation of this arc that the point passed on to the orbit of that point was supposed to be smaller than the arc of another point that passed on in the same hour to the orbit of that point, because unlike other points, the point of touch does not leave its position during any part of this hour. If it is accepted that one of the points does not move, in this case because the point of touch occurs after each other, then the [sphere] will not move during the entire period of rolling. In parts of these rolling times, there is no part for the continuation of contact at any time. So, this is clearly invalid.

Third: If a certain point of contact persists at the time, then this point can never be separated from its position at this time of contact and will not be polar for the sphere's circular movement. Otherwise, if it were polar, then the sphere would revolve around its own axis and would not leave its own location. However, it is assumed that the sphere is rounded, and so that is also a contradiction. [In case this point is not polar,] it is also necessary to stop a point outside the pole of the rotating sphere, which is likewise invalid.

Fourth: We draw on a sphere a large circle that passes through its two touchpoints. Then we assume that the sphere moves on a flat line on this circle and surface and say: "If the contact on the first point persists in time until contact occurs at the second point, and if another contact occurs in one of the points that

are assumed to be in a limited arc with these two points, then the sphere must contact the surface at many parts. This is invalid. If [there is no such contact] and this arc is parallel to this line – it was assumed that this arc did not come into contact with this line – either the sphere cannot be a sphere or this surface is not flat. This is a contradiction. When the arc is not parallel to the line, the [sphere's movement] is either a leap (*ṭafra*) or the rounding should not happen in this circle. This is a contradiction in the same way.

Fifth: Each point which is assumed between two touchpoints in a limited arc with these two points are closer to the surface than the second point of touch. A point closer to the first point is closer to the surface than a point that is farther away from the first point. When the closer point does not reach the surface, the farthest point also cannot reach the surface in such a way that we move all of them to the surface by a single movement. Since there is no point in this arc that does not come into contact with the surface, it is not possible for the contact to be made with non-successive points and the continuation of contact at a single point in time. This is what we mean.

Sixth: If the touchpoints [in the same arc that is limited by the mentioned points again] have not moved from their locations, but before they were able to complete a return due to their inactivity during the time of contact, then they had completed their rounds during their movements. In this case, [ which the touchpoints that the big circle transits on them had not yet been completed a tour] other points that differ from these touchpoints must have not completed their tours. But they were assumed to have completee their tours. This is a contradiction.

Seventh: The angle between the sphere's belt (*minṭaqa*) and the straight line on the surface does not accept to the shrink, and so we cannot assume that an angle smaller than the first one occurred between this circle and this line. Otherwise, a right angle would be part of an[other] upright angle. The continuity of the touchpoint would, along with the movement of the sphere, require it. This is a contradiction.

Eight: If the touch at the first point had continued until contact was made in the second one, and if it were eliminated at the moment of contact with the second [point], then in that moment there is either only one point between the first point and the surface, which clearly requires the succession of three points, including the surface, the sphere, and the point between them. [Or, between the point and the surface] there are multiple points, which requires the sphere to move one distance in one instant, which is impossible. The overlap among distance (*masāfa*), time, and movement is required.

As for the famous doubt, it is: When the sphere moves, passing from one end to the other, on a flat surface, each assumed point of contact between the movement's beginning and end constitutes one of the boundaries of the sphere's distance. As long as the moving object keeps moving, it cannot remain at one of the limits of its distance for more than an instant. How could this happen, given that the form of movement between the start and the end is intermediate? In other words, the limit that the moving object assumed at the moment of the move has no before or after.

It is necessary to prepare an introduction (*muqaddima*) to describe it as it requires, which is as follows: The falāsifa (*qawm*) classified occurrence (*ḥuṣūl*) as [1] gradual (*tadrījī*), which is a continuous entity that overlaps with time like movement, [2] momentary (*dafʿī*), which occurs only in instant or in an instant with the time, or [3] (*dafʿī/ghayr tadrījī*), which was meant to overlap with it but occurs at this instant assumed in that time, not at the end of it. They said that the [final] one is an instrument between the momentary and the gradual, which are used in both directions.

Muḥaqqiq al-Ṭūsī added a momentary occurrence (*ḥuṣūl*) to the first session [2a] in the former sense. He divided the third session into "it exists in time and also ends" – which is the second session of the momentary *ḥuṣūl* in the former sense – and [2b] "it exists in time but does not end" – which is the third session in the previous divisions. There is no debate on such a division. For this reason, sometimes you will hear them by saying, "The end of the arrival (*wuṣūl*) is momentary (*ānī*) and sometimes it is temporal." [In fact, these words] mean the same. As the *shāriḥ* and *muḥaqqiq* [al-Jurjānī] explained in various chapters of his books, they said: "It is momentary occurrence to reach a moving any one of the boundaries of the distance in the sense of momentary occurrence." They did not explain the issues that should be proved because they are clear enough.

I say: "This is the explanation: If it was not momentary occurrence to reach any limit, [1] it would either be gradually – and in this case, the boundaries of the distance would have to be divided into its extensions – or [2] not gradually. This is also invalid whether it is in the moment and in time or only in time, because if *ḥuṣūl* persists at any time on a particular border, it would have to stop at this border, since [1] no other ones would be moving at one of the boundaries of the distance at this time. But we hsf assumed that it was still moving. [2] Or, in the same way, the moving object would have to be at another boundary, which would require the combination of the parts of the movement and its boundaries. Both of these are impossible."

In another way: "If an object moves constantly in time, it is contrary to the assumption that this is the time of rest. If it is the time of motion, [this movement] must either be [1] at this limit – which had not yet arrived, but was assumed to have reached – or [2] through this limit – which is invalid, because this requires that the boundaries of the distance be divided in their extensions – or [3] [starting] from this limit, which is also invalid because the movement [emerging] from an assumed beginning is a mediation (*tawassuṭ*) between this beginning and the end; it cannot come together with the accident of location (*kawn*) in here. They also said that the end of the arrival (*wuṣūl*), starting at a border of the distance, is temporal, just as it was in the third session. If it was gradual this limit would have to be divided, and when it was momentary, the moments would come in succession. Likewise, it is understood that the arrival will occur at the moment.

When this is thoroughly understood, we say: "If the sphere is rounded on a flat surface, each touchpoint between the beginning and the end of this rolling is one of the boundaries of its distance. The sphere's contiguity to that point is arriving to that limit and the cessation of the contiguity to that point is arrival of this particular border by leaving through another limit. It is understood from all of this information that the movement on each border cannot meet with the location (*kawn*) here and, if it precedes [the arrival] with an essential priority, then the cessation of movement creates a temporal association. The part and the instant cannot be assumed at this time before the end of the arrival, and thus movement cannot be realized and each point cannot come together with an arrival toward another boundary. The meaning of their words: "The end of the arrival is only with movement and gradual [*ḥuṣūl*]" is that the arrival depends on the motion and falls behind it with essential posteriority, which is not contrary to the occurrence of movement at all times of arrival. It is required if the temporal lateness happens gradually in the aforementioned sense, which is not because of the issue we have described before. Yes, it happens later temporally from the movement that leads toward the arrival, but it does not harm what it meant, because the end of the contiguity is at another time and at another point. What this means is: "Another point in the moment of extinction (*zawāl*) cannot be assumed, without putting together that cessation in that instant with the contiguity to another point," as was mentioned before. Between each point (i.e., the second point) where the end of contact at the first point meets the contiguity and first point, there is a distance in which the sphere moves between the instantaneousness of the contact in time. This first contiguity does not proceed in the moment of movement; on the contrary it ends, as was mentioned earlier. So until the moment of contact occurs at another

point, any assumed point will not be sustained. Yes, if the contact at the first point does not end but occurs in the moment of contact wtih another peculiar point, then the previous contact must continue until the next touch occurs. This is possible only if there is a certain limit for distance and time; however, it is impossible to assume this limit for anything else. Thus, it is revealed that the end of the contact occurs in motion and that the gradual occurrence does not require perpetuity of the contact at the time of movement. On the contrary, it has occurred along with the movement in time and thus has been concluded to desired result (*maṭlūb*).

I say: "Thus, the estimated issue is eliminated: 'There is a definite distance (*bu'd*) between each point on the sphere and the surface, except for the touchpoint. The contiguity at one point ends when the second occurs. The contiguity of a second point also occurs only when it moves along the distance between the surface. So the contiguity continues at this time of movement. Otherwise, the act of rolling canot be realized without contact.'" So we say, as it turns out that the end of the contiguity will not happen at the moment, his sentence that "Contiguity does not end at the first point unless the second point arises" cannot be true.

Since the assumed time is limited by the instantaneousness of both contacts, it is also part of its expiration time and therefore will not be the time of the first contact's perpetuity. At this instant assumed in this time, contact occurs with the points that are assumed to be between these two points. The first contact does not continue at this time; it is even eliminated. By that way, this also resolves the confusion of some virtuous people (*fuḍalā'*) about the "occurrence of the movement in any boundaries of the distance and in the sense of intermediary in any instant," because, as was mentioned earlier, movement does not occur at the beginning and the boundaries of the distance, or it should be achieved without movement to reach this limit from the beginning. When it is manifested that what is happening in time -not its extremes- is also a kind of occurrence (*ḥuṣūl*) and the movement is also from this kind of husūl, it is also understood that there is no instant in the time of movement allocated for its emergence. [We say this] because between each boundary and its ends, which are assumed in time, it is possible to assume the infinite boundaries in which the movement takes place, due to the continuity of time and the nature of the movement that accepts infinite division. Likewise, there is no limit on the distance, as it overlaps time and accepts infinite division.

When it is proved that the successive points could not have caused contact, then let's begin to examine what caused the state of rolling to occur.

We say: [1] It is not possible for contiguity to occur with consecutive (*mutatālī*) points. Although the points occur one after another according to the renewal and interruption of the contact, it is not a consecutive and consequent (*mutarattab*) thing. [This is so] because it both necessitates that one considers the consecutive points and also requires the successive moments, even one of which is sufficient to prove the atom. [2] As is known from the answer of the famous doubt (*al-shubhat al-mashhūra*), contiguity does not occur with a flowing point whose individuation (*shakhṣiyya*) continues from the rolling's beginning to its end and its some assumed accidents substitute (*tabaddul*) every instant by its individuality and with the perpetuity of its essence, because this requires the point move by itself, which is impossible. If both are to be handicapped, the impossibility here is better understood than the contact point in the sphere than the contact point on the surface. [3] The contact does not occur with two lines, one of which is linear (*mustaqīm*) and the other circular (*mustadīr*) and their pieces are found together (*qārr*). Because there is no line in the sphere or on the surface, contact cannot cause these lines to appear on them. We certainly know that the thing that provides the contact as well as its stuation after the contiguity's cessation is the same [as that] before it. Therefore, there is no line after contact, as it is not before contact. When these options are invalid, it becomes apparent that the parts of the contact are not together at the same time (*ghayr qārr*) with two lines, which is clearly understood. Because the contact, which leads to the emergence of something that is not before, and the movement of the sphere followed by the contact is the thing that has no actual parts and its components do not come together in reality (*ghayr qārr*) and it is also a single-continuous in the *nafs al-amr* (matter of fact) then the contiguity must be something like this. That is the only line at which their parts do not come together in reality.

The Sheikh [Ibn Sīnā] has put forth a long chapter in his *al-Shifāʾ* to prove that movement and time do not have first parts. He did this to prove that what provides contiguity is the state of movement, which is constant, and that the first part of the time was not formed by the first part of the movement. Let that piece be a point! He made that claim after he said: "The sphere's contact with the surface and the line does not need to be just a point, no matter in which case, but it is in the states of permanence and rest. When the sphere moves, it touches the line at the time of movement. The time at which the contact with the point occurs is only in the estimation, because this contact can only be imagined at the moment, and the moment has no actual existence." This answer can only be considered after ignoring the part, which is where the debate is, because that is sufficient to declaring to the

ḥakīm (the philosopher) [to ignore the part]: "Why would it be permissible for the state of movement to provide the contiguity, which is a continuous thing, and its parts do not come together in reality like the movement? The final purpose of the issue is that he believes that there may be a possibility of [contact with the point].

I say: In this answer, there are two problems (ishkāl):

The first problem is that, as the sharīf and muḥaqqiq explains with the benefit of the words of the Imām [al-Rhāzī] found in Sharḥ al-Ishārāt, the existence of something similar to that is not reasonable, how would it be? If that were possible, it would permit the existence of movement in the sense of time and transition. Besides the Sheikh refuted it in his al-Shifā' as follows: "If it is meant by movement that is a reasonable and constant thing for a moving object between the beginning and the end, it is clear, it can't happen in anyway while the moving object between the beginning and the end. On the contrary, it is believed that this happens through the occurrence while moving at the end. There is no provision of that reasonable constant thing here (between the beginning and the end) having any real occurrence in the reality. On the contrary, it is a circumstance that has no essence, which is existence in the concrete world (a'yān)

Second problem: "As the sphere has contact with the line at the time of movement, there is a contact with that line in every moment that is assumed in time. In addition, the thing that provides contiguity should be present at the time [just] as it should be present in the moment, which is the only point. For this reason, although it is limited between two delimits, in this line whose parts do not come together, there must be an infinite point that has a regular position in the nafs al-amr.

In relation to the words of [Ibn Sīnā]: "The actual time in contact with the point is only in the estimation. This only happens by thinking of the moment, but the moment has no reality." I said: "The occurrence of the contiguity in the instant, according to the nafs al-amr, whether this instant is real or not, is sufficient to prove that point, just like the happening of contiguity at the time of movement was enough to prove that the line and the estimation of the time and movement did not damage it. Also, it cannot be said: "This problem also applies to the line, [for] it is possible to assume an infinite point on the line."

I said: Estimation cannot afford to bring infinite situations into the intellect. Because of estimation, the conditions that emerge from the potential to the actual are finite in all cases. As for the intellect, it can comprehend these infinite points

only in a way that encompasses them all and universal manner. As explained in the relevant part, infinite things do not come from the potential to the actual by assuming the intellect. Regarding our review here, when the contact at the moment is the cause of the body of the moment, and the contacts that occur in the instants are infinite in terms of an eternity of the instants, then the points in the external world happen infinitely in the same way.

I say: The true answer, which is not possible to escape, here requires the preparation of a premise, which is: "This evidence and most of the [other] proofs are based on the permanence of the part/atom. Accordingly, it is necessary to have a reality of the thing that provides contact, whereas that is not the case [here]. The [proofs] that they mention to prove the part, such as [1] there is no doubt about the reality of objects and they are in contact with the entities divided by width and length, not in depth, or that interpenetration is required between two things that are divided in depth or [2] the contiguity happens with two parts between two lines, not with two objects." In that case, we carry on the debate of these two parts and their non-division, so that this division does not regress infinitely (*tasalsul*), but rather results in a thing that is indivisible in depth, which is the surface. This is why the reality of the surface will be proved. Then the two existent surfaces come into contact with something that is divided not in width – but as you know, one of two states is required – which is the line. Thus, the existence of the line is proved. Then the two existent lines come into contact with something that is located and never undivided, which is the point. Here is the debate, because if it is meant by the existents that the assumed contiguity took place, the most suitable thing for the contiguity, we prefer to have the essences of the bodies (line-surface) divided in the directions.

His claim, "Otherwise, interpenetration must occur" is unacceptable (*mamnūʿ*), because interpenetration requires that the contact be attached to each one of the parts or to some of them. Why would it not be permissible to assume [this] for the all body in terms of its entirety rather than each part or just some of them?

In summary: Due to the fact that a surface is an object, it attaches only to the body, not to all or some of its parts, because the division of the body in directions does not necessitate the division of the surface, because of its spread only in two directions, not all. As such, it is also possible to assume that it contacts in terms of it is a body, not with all parts of it or some of them in a way that will cause the abovementioned two problems to arise. Like this, we also say this in the contact of the surfaces with lines and the contact of the lines with points, and one needs

evidence to reject it. The intellect's determination of some aspects of the object for contact in the sensory signal is not an obstacle to the contiguity's attachment to it. This is caused by the spread of the object only in some aspects, such as at the ends. Because it spreads in some directions in the same way as does the sensory signal, it is determined in these directions and not in other ones.

I say: If "the thing that provides the assumed contiguity" means "the most suitable thing for the contact," and this denial (*manʿ*) could not be meant for the evidence, then the permanence of the surface in the body requires the permanence of infinite surfaces that attach theselves to each other, or [all these surfaces] must come to an end in the surfaces par soi (*jawharī*). We say: "The thing that the surface is attached to (*maʿrūḍ al-saṭḥ*) cannot be something that is divided in all directions, for that requires either division of the surface in directions or the attached thing must be the part of it's assumed parts that are attached to. In that case, the debate is carried on there and does not regress infinitely; rather, results in the surface par soi, which is the surface." Likewise, we say that this surface either goes on forever (*tasalsul*) or that it ends on a surface par soi. This is the case with the status of the line and the point; however, it is impossible to say that about them too. If "the thing that provides the contact" means "the vehicle that ensured the permanence of the contact in the subject of the attachment," we prefer that it not be an existing circumstance that co-exists either with the object or with part of it, or that it occurs with the body in the external world. On the contrary, the vehicle here, it is the possible to assume the surface in the object. So if this property (i.e., the surface) is not in the object, then the contact is not attached to it. Compare the contiguity of two lines with one point, and the contiguity of two surfaces with a line! Therefore, characterizing the object or something else in the *nafs al-amr* with the mental concepts, or the possibility of our thinking of some situations in the object thanks to the true consideration that overlapped the *nafs al-amr*, is not a condition that can be denied. Is it not understood in terms of the relationship of light to Earth that Earth is in the opposition of the light-giving objects and that the relationship of different colors and lights to the adjacent object is only possible because we are able to imagine that thing in the object according to the true consideration? Even if the object did not have this characteristic, the opposite things in one moment were not attached to the object, since the contact is not from the external entities, but from the relations that are specific to those things that have a location.

I say: A person who says that the cause of contiguity must be in the external, why not say that the cause of the contraposition (*muḥādhāt*) will be in the external,

with a very small modification and by presenting evidence? Yes, contiguity can occur between the extremes if they were before the [contiguity], and there is no debate in this regard for us. The main debate is, "Does contiguity require these extremes later if they were not before?"

When they obtain this premise as an argumentum ad hominem, (ilzāmī) we say: What is mentioned in the position of evidence is a caution concerning the existence of the ends, or is not evidence of contact. What the commentator said in the *Ḥāshiyat Sharḥ al-Tajrīd* also corroborates the issue that we mentioned: 'If the object only ends in one of its directions, then there is something (i.e., the surface) that necessarily must extend in both directions. If the surface ends in one of its directions, then there is something (i.e., the line) that also necessarily must extend in one direction.' Therefore, the actual reality of the thing that caused the contact (i.e., line) means the determination (taʿayyun) and the distinction (tamyīz). Yes, they made the permanence of the mathematical bodies inferential, but are they the same thing?

[Quṭb al-Dīn al-Rāzī] after saying in *al-Muḥākamāt* that the differentiation of the attributes does not require an external division in the bodies, went a little further and said: "What is meant by the action is not an act of existence in the concrete world (aʿyān), but a more general thing." It is clear that the differentiation of the attributes require neither a discontinuity in the external objects, nor a division at the ends.

As for the evidence provided by [Ibn Sīnā] for locating the rest between two linear movements (rise and fall), he said: "The Imām demonstrated the invalidity of this view by following examples: i) each star contacts with its own celestial spheres to the certain points of the celestial sphere of Atlas, which, as a matter of fact, is also the same for the contact of the epicycle while it was in the apogee to the apogee of its carrier celestial sphere or the contact of epicycle while it was in the perigee to the perigee of its carrier celestial spheres – ii) reaching of the stars to the apogee and perigee iii) and projecting stars toward the point of the equinox." These refutations also occur with the assumed limits. This is evident about the contact point, such as the point of encounter (musāmata), that does not exist in the external.[1]

The Sheikh said that in the chapter of *Ṭabīʿiyyāt* of *al-Shifāʾ*: "The limits in the continuous [entity] are not actual but potential. These limits become actual

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1    I would like to thank Eşref Altaş for his suggestion on translating this paragraph.

either with a cutting (*qatʿ*) or with limited conformance (*muwāfāt maḥdūda*) like contiguity and parallelism (*muwāzāt*), or with the assumption (*fard*)." It is obvious that assumption and parallelism are not the reason for the boundaries to be actual in the external, but in the estimation, and that contiguity and its counterparts are the same. So when they said that the contact point actually existed, it turned out that they meant existence in the intellect and actuality in the estimation.

When it clarified that this precise that they depended their evidence on, it can't be accepted neither demonstrative nor obligatory, I say: "When the sphere touches a flat surface, the real contact is only the contact of the sphere's surface with this flat surface. However, due to this contact, two points become evident in the sphere's surface and the flat surface in the estimation, just as the determination of some limits by some parts of other attributes and some parts of the body by the thing that resides in the body. Then, when the sphere is rounded on the surface, it also touches the two surfaces itself in the same way at a rolling time. However, due to this rolling, a smooth circular (*mustadīr*) line in the sphere and a straight (*mustaqīm*) line on the smooth surface become apparent and differentiated (*tamayyuz*). Thus, at each moment assumed in that time, the two points are distinct from these two lines. It is also impossible to think about two moments that have no time between them, just as it is not possible to assume two points that have no line between them. Therefore, the condition of the surface and the sphere in the moment of contact is like that before the contact. And the aim (*ghāya*) of this, thinking of these points as an incentive (*bāʿith*) that was not before. The reason for thinking about the two lines, not two successive points in the time of movement, is the continuity of time and movement."

This answer is not contrary to the information narrated from the Sheikh's *al-Shifāʾ*. He said: "When the sphere moves, it touches the [surface] with a line at the time of movement." This sentence does not indicate the [external] entity of this line, because we explained earlier that what is meant by the "thing that makes contact" is the thing that contiguity has found in the object, thanks to the imagination. The "*bā*" in the phrase [*mā bihī al-tamāss*] is not for the connection (*ṣila*), but for the causality. They also attributed contiguity to its cause and, as they used the phrase the "thing that makes parallelism" (*mā bihī al-muḥādhāt*), they describe it in order to expand the meaning (*tawassuʿ*). It is clear that, the fact that something was in the encounter of another thing else in the external world due to the existence of both things as like as contiguity. However, parallelism is not really with these ends. However, they use one of these two meanings ascribed for them.

He [Ibn Sīnā] said: "The actual time that the contiguity will be only in the estimation" is also clear, as we mentioned earlier. There is no specific situation to the state of movement, but it is exactly the same as in the state of rest. That is correct, because the context of the word (*siyāq*) necessitates that contiguity be with the line in the *nafs al-amr* and with the point in the estimation. However, a serious investigation requires that the contiguity of two surfaces be the same at the moment. How can this be possible, for the occurrence of contiguity in time with two lines requires the existence of these lines at that moment, which, as was mentioned earlier, is impossible? In that case, the momentary contact is either completely rejected, and said: [1] "There is no contact at the time according to reality," and thus contiguity does not occur in any moment of the time of the rolling, and therefore at this moment. Because the contact is not temporal in terms of being gradual – as it has to be to arrive at the end – it is momentary occurrences (*āniyyāt*) that continue in time. Thus, it is temporal in the sense that one cannot assume a moment in time without the occurrence of contiguity in time. Yes, there is no debate on the graduality of the contiguity of two lines and its not happening in a moment, according to the assumption of its incidence. Undoubtedly, contact takes place when the sphere's movement, which leads to contact with the surface, is interrupted, and then it continues as long as the sphere remains on the surface. [2] Or it is said that the contact occurs at two points on the surface. This is also invalid because it requires the accruals of infinite points, as was mentioned earlier. [3] Or contiguity is said to occur with these two lines, which requires contact with something that is non-existent, because it has no accrual in reality for two points. [4] Or the contiguity is said to occur with two surfaces so that the desired thing (*maṭlūb*) is fixed and there is no need to prove the two lines for contact in time.

I say: "It is possible also in the answer to apply the issue that the *muḥaqqiq* narrated from Ibn Sīnā. He mentioned this in his *al-Taʿlīqāt*, and then the topic will be completed without any gap. Then the answer that the *muḥaqqiq* [al-Jurjānī] responded with his sentence "It isn't possible to say" is as follows: "Contact with the surface on the state of movement is like that on the state of rest." However, whenever this moment is assumed at the time of movement, it will be changed, and, in fact, there is no need for the *muḥaqqiq* (q.s.) to say "It is not possible to say" in the answer.

Then the author of *al-Mawāqif* [al-Ījī] said: "Let's assume a line that is perpendicular to a line and passes over it. This line touches all parts of that line in this progression. The contiguity here is done with a point, and the line that is

passed over consists of the points. Thus, the surface from the lines and objects are composed of surfaces."

The *shāriḥ al-muḥaqqiq* [al-Jurjānī] said: "This following [objection] is directed against al-Ījī: 'Moving is spatial by itself and must be divided in all directions, as will be described later on. As the surface, line, and point are accidents, how can it be imagined that an accidental line moves on another one that is similar?'"

I say: The purpose of the author [al-Ījī] here cannot be attributed to the fact that the line is spatial by itself. The subsisting of the line on the other line through its subject and its progress on it can be imagined even if it is present. Then why is it necessary to prove its movement by itself? If we (a) put one end of the cube's line on another and then move the cube so that it passes through the line on the end of the line, or (b) place the cone's top point on a line or the surface and then forward it to the surface, or (c) put the sphere on the surface and forward it without rolling – all of these reveal the point that he claims. Compare that with the movement of the line on the surface! What is adequate for the author is that he respond to that objection just as he did it for the similar ones and say: "Contiguity happens only by the points that do not come in succession." He avoided this statement because its corruption was so obvious. We do not repeat the aforementioned correct answer here.

This treatise has been completed by the assistance of God. He is the Sovereign [al-Malik] and the Bestower [al-Wahhāb].