Eskiyeni 51 (December 2023), 1023-1044
Research Article

The Approach of Kalām to the Physical Universe: Schools and Breaks

Yunus Cengiz
0000-0001-9318-079X
yunuscengiz@artuklu.edu.tr
Mardin Artuklu University
Mardin Artuklu University, Fac of Literature, Dept of Philosophy, Mardin, Türkiye
ror.org/0396cd675

Abstract

Since the end of the eighth century, Muslim theologians (*mutakallimūn*) have been more interested in the physical universe and have put forward theories on subjects such as matter, motion, stasis, and change that were not on their agenda before. As the approaches to physics of Kalām schools are different from each other, the way of thinking about physics in different periods is also different. This study aims to determine the approaches of Muslim theologians to the physical universe. In this context, it can be said that Muslim theologians have five different approaches. The first of these is the supporters of accidents. This approach, which argues that the universe consists of accidents, suggests that it is the work of our minds to see objects as integrated structures. The second is naturalist theologians such as al-Naẓẓām, al-Jāḥiẓ, and Thumâma. Their common feature is that they accept the nature of objects. According to this approach, objects must behave according to their nature without needing any other intervention. al-Naẓẓām developed a theory suitable for this approach and tried to support it with experience. al-Naẓẓām, who rejects atomism, insists that objects are composed of opposite components and that they have an internal dynamism that allows them to be in constant motion. al-Jāhiz, on the other hand, did many experiments to learn the nature and movements of animals. The third approach to the physics of Kalām is atomist theologians. Atomism is the most common physics approach in Kalām. According to this approach, objects are not divided infinitely. The universe is made up of indivisible particles. This approach insists that there are voids between atoms. Atomist theologians, who give some examples to defend their ideas, do not accept that objects have nature. Instead, they developed the theory of impetus (*iʿtimād*) to explain motion. The fourth approach is both atomists and naturalist theologians. This approach, led by Abū al-Qāsim al-Kaʿbī, argues that the universe consists of atoms and that every object has a nature. This approach says there is no void in the universe and tries to prove this idea by explaining many phenomena. The fifth approach is taken by theologians who evaluate the physical universe with Aristotle's theory of four causes. After al-Ghazzālī, Ashʿarī theologians tried to harmonize Aristotle's theory of four causes, which formed the basis of his physics, with their theological theses. The article discusses what methods are followed to achieve this.

Keywords

Kalām; Atomism; Impetus (Iʿtimād); Theory of Four Causes; Complete Cause

Highlights

- This study aims to determine the approaches of Muslim theologians to the physical universe.
- Kalām's experience of relating to the physical universe differs periodically.
- There are quite different approaches in Kalām physics depending on their proximity and distance to scientific criteria. Some are experimental, some are analogical, and some are analytical.
- In the ninth century, Kalām physics, which included synthetic orientations, was drawn to an analogical approach in the tenth and eleventh centuries and to an analytical universe in which formal logic determined its framework in the thirteenth century and later.
- The theologians' interest in the physical universe and the ideas they produced in this field deserve to be examined in terms of philosophy and the history of science.

Citation

Cengiz, Yunus. "The Approach of Kalām to the Physical Universe: Schools and Breaks". *Eskiyeni* 51 (December 2023), 1023-1044. https://doi.org/10.37697/eskiyeni.1303864

Article Information

Date of submission	27 May 2022
Date of acceptance	22 December 2023
Date of publication	31 December 2023
Reviewers	Two Internal & Two External
Review	Double-blind
Plagiarism checks	Yes - Turnitin
Conflicts of Interest	The Author(s) declare(s) that there is no conflict of interest
Complaints	eskiyenidergi@gmail.com
Grant Support	* This article has been prepared within the field of activity of the project numbered 120K004 "Models of Physical Theories between Eleventh and Thirteenth Centuries Islamic Thought: Method, Theory and Application" supported by TUBITAK
S. Development Goals	--

Eskiyeni 51 (Aralık 2023), 1023-1044
Araştırma Makalesi

Kelâmın Fiziksel Evrene Yaklaşımı: Ekoller ve Kırılmalar

Yunus Cengiz
0000-0001-9318-079X
yunuscengiz@artuklu.edu.tr
Mardin Artuklu Üniversitesi, Edebiyat Fakültesi, Felsefe Bölümü, Mardin, Türkiye
ror.org/0396cd675

Öz

Kelâmcılar, sekizinci yüzyılın sonlarından itibaren fiziksel evrenle daha fazla ilgilenmişler ve daha önce gündemlerinde olmayan cisim, hareket, durağanlık ve değişim gibi konularda teoriler ortaya koymuşlardır. Kelâm ekollerinin fizik yaklaşımları birbirlerinden farklı olduğu gibi farklı dönemlerdeki fizik hakkında düşünme tarzları da farklıdır. Bu çalışmanın amacı kelâmcıların fiziksel evrene yaklaşımlarını tespit etmektir. Bu bağlamda, kelâmcıların beş farklı yaklaşımının olduğu söylenebilir. Bunlardan birincisi araz taraftarlarıdır. Evrenin arazlardan meydana geldiğini savunan bu yaklaşım cisimlerin bütünlüklü yapılar olarak görülmesinin zihnimizin eseri olduğunu savunur. İkincisi tabiatçı kelâmcılardır. Nazzâm, Câhız ve Sümâme bu yaklaşımı savunan kelâmcılardır. Onların ortak özelliği cisimlerin tabiatlarını kabul etmeleridir. Bu yaklaşıma göre cisimler başka bir müdahaleye gerek kalmaksızın tabiatlarına uygun bir şekilde davranmak zorundadır. Nazzâm, bu yaklaşıma uygun bir teori geliştirmiş ve teorisini tecrübelerle desteklemeye çalışmıştır. Atomculuğu reddeden Nazzâm cisimlerin karşıt bileşenlerden oluştuğunu ve onların sürekli hareket halinde olmalarını sağlayan iç dinamizme sahip olduklarını ısrarla söyler. Câhız ise hayvanların doğasını ve hareketlerini öğrenmek için çokça gözlem yapmanın yanı sıra birtakım deneyler yapmıştır. Kelâmın fizikle ilgili üçüncü yaklaşımın sahipleri ise atomcu kelâmcılardır. Atomculuk kelâmda en yaygın fizik yaklaşımıdır. Bu yaklaşıma göre cisimler sonsuza kadar bölünmez. Evren parçalanmayan parçacıklardan oluşur. Bu yaklaşım atomlar arasında boşlukların olduğunu ısrarla savunur. Bu düşüncelerini savunmak için birtakım örnekler veren atomcu kelâmcılar, cisimlerin tabiata sahip olduğunu kabul etmezler. Bunun yerine evreni açıklamak için itme gücü (*i'timâd*) teorisini geliştirmişlerdir. Dördüncü yaklaşımın sahipleri ise hem atomcu hem tabiatçı kelâmcılardır. Ebu'l-Kâsım el-Ka'bî'nin başını çektiği bu yaklaşım, evrenin atomlardan oluştuğunu ve her cismin bir tabiatının olduğunu savunur. Bu yaklaşım evrende boşluğun olmadığını söyler ve bu düşüncesini birçok tikel fenomeni izah ederek ispatlamaya çalışır. Beşinci yaklaşım ise Aristoteles'in dört neden nazariyesiyle fiziksel evreni değerlendiren kelâmcılardır. Gazâlî sonrasında Eş'arî kelâmcılar, Aristoteles'in fiziğinin temelini teşkil eden dört neden nazariyesini kelâmî tezleriyle uyumlu hale getirmeye çalışmışlardır. Makalede bunu başarmak için ne tür yöntemlerin takip ettiği ele alınmaktadır.

Anahtar Kelimeler

Kelâm; Atomculuk; İtme Gücü (*İ'timâd*); Dört Neden Nazariyesi; Tam İllet

Öne Çıkanlar

- Bu çalışmanın amacı kelâmcıların fiziksel evrene yaklaşımlarını tespit etmek etmektir.
- Kelâmın fiziksel evrenle ilişki kurma tecrübesi dönemsel olarak farklılık arz etmektedir.
- Bilimsel ölçütlere yakınlık ve uzaklıklarına göre kelâm fiziğinde oldukça farklı yaklaşımlar vardır. Bazıları deneysel, bazıları analojik ve bazıları analitiktir.
- IX yüzyılda sentetik yönelimler içeren kelâm fiziği, X. ve XI. yüzyılda analojik bir yaklaşıma XIII. yüzyıl ve sonrasında ise formel mantığın çerçevesini belirlediği analitik bir evrene çekilmiştir.
- Kelâmcıların fizik evrene ilgisi ve bu alanda ürettikleri düşünceler bilim felsefesi ve tarihi açısından incelenmeyi fazlasıyla hak eder.

Atıf Bilgisi

Cengiz, Yunus. "Kelâmın Fiziksel Evrene Yaklaşımı: Ekoller ve Kırılmalar". *Eskiyeni* 51 (December 2023), 1023-1044. https://doi.org/10.37697/eskiyeni.1303864

Makale Bilgileri

Geliş Tarihi	27 Mayıs 2023
Kabul Tarihi	22 Aralık 2023
Yayım Tarihi	31 Aralık 2023
Hakem Sayısı	İki İç Hakem - İki Dış Hakem
Değerlendirme	Çift Taraflı Kör Hakemlik
Etik Beyan	Bu çalışmanın hazırlanma sürecinde etik ilkelere uyulmuştur.
Benzerlik Taraması	Yapıldı – Turnitin
Etik Bildirim	eskiyenidergi@gmail.com
Çıkar Çatışması	Çıkar çatışması beyan edilmemiştir.
Finansman	Bu makale, 120K004 nolu "On Birinci ve On Üçüncü Yüzyıllar Arası İslam Düşüncesinde Fizik Teori Modelleri: Yöntem, Kuram ve Uygulama" isimli proje kapsamında TUBİTAK tarafından desteklenmiştir.
S. Kalkınma Amaçları	--
Lisans	CC BY-NC 4.0 creativecommons.org/licenses/by-nc/4.0/deed.tr

Introduction

Since the end of the eighth century, Muslim theologians (*mutakallimūn*) have begun to understand the environment, nature, objects, movement, and the physical universe in the most general sense and to produce ideas on these issues. The topics of discussion among the theologians in the ninth century considerably differed from the previous century. In addition to the existence of God, his attributes, and the freedom of man, issues related to the physical universe, such as atoms, nature, motion, bodies, animals, plants, and metals became the subject of scientific interest in this period. In times of scientific leaps, knowledge is often not produced in one style. Almost every theologian of this period has his conception of a physical universe. Among them, some approach the physical universe purely theoretically, and some set their goals to study different particular phenomena through experience.

In shaping the scientific understanding of theologians, Aristotle, other philosophers of Greek culture, Galenus and Stoicism, and even Indian culture had an impact. Before the translation movement, which started systematically, we should consider that the theologians had an interest in the physical universe. In the first quarter of the eighth century, the debates regarding whether things have a nature show that the attempt to explain motion in the universe goes back to the very early periods of Kalām.[1] The interest of the early theologians was not only in theoretical physics. In other words, the topics related to atoms, bodies, and motion were not discussed only intellectually. Even though they lacked a scientific system that proceeds with experiments and predictions based on hypotheses in the sense we use today, the theologians of this period experienced, observed, and interpreted objects and their movements with a scientific imagination. The interest in the physical universe, which started with the Muʿtazila, was soon revised and systematically theorized by different thinkers of the same school. The theologians' interest in the physical universe and the ideas they produced in this field deserve to be examined in terms of philosophy and the history of science. There are quite different approaches in Kalām physics depending on their proximity and distance to scientific criteria. Some are experimental, some are analogical, and some are analytical. Evaluation of Kalām physics primarily depends on revealing the data in this field. The clarity of these data depends on classification, mapping, and showing the breaks in Kalām physics. In this sense, a considerable amount of work has been done on the physics of Kalām. To offer a map of Kalām physics, this study aims to classify the data in the field. Under this framework, we can evaluate the theologians' approaches to the physical universe in five groups: supporters of accidents, naturalist theologians, atomist theologians, both atomist and naturalist theologians, and theologians approaching the universe with Aristotle's theory of four causes. Since almost every theologian has a different conception of the universe, this classification may have some flaws. However, drawing attention to different opinions can eliminate these problems.

[1] ʿAmr b. Baḥr al-Jāḥiẓ, *Kitāb al-Ḥayawān*, Critical ed. ʿAbd al-Salām Hārūn (Cairo: Jamʿiyya al-Mutakāmila, 2004), 5/11; Mehmet Bulgen, "Science and Philosophy in The Classical Period of Kalām: An Analysis centered upon The Daqīq and Laṭīf Matters of Kalām", *Kader* 19/3 (December 2021), 941.

1. Supporters of Accidents

In the history of Islamic thought, we see that the first production of ideas about bodies and their parts was made by Ḍirār bin ʿAmr (d. 200/815). Although Ḍirār is often considered within the Muʿtazila school, there is no clear data showing his affiliation with any school. Along with Ḍirār bin Amr, Ḥafs al-Fard (d. 195/810 [?]) and Ḥuseyn al-Najjār (d. 2020-230/835-845) are known as supporters of accidents (*asḥāb al-aʿrāḍ*) in the history of Kalām. In the period when these ideas were discussed, the approach arguing that the universe consists of bodies is called supporters of bodies (*asḥab al-ajsām*), and Hishām b. al-Ḥakam (d. 190/805), al-Aṣamm (d. 200/815) and Ibrahīm b. Sayyâr al-Naẓẓām (d. 231/845) are included in this group.

Dirār thinks that the universe reality consists of particles and calls them accidents. Accordingly, the realities we perceive as bodies; consist of accidents such as colour, warmth, space, vitality, and lifelessness. They do not exist on their own. When they come together, they come into existence and appear together in the form of bodies. Therefore, just as there is no substance in the universe, bodies are not integral structures. Bodies exist as piles of qualities. These piles/combinations of accidents are perceived by us as structures and bodies. The accidents do not exist as interpenetrated but as side by side. A combination of accidents disappears when another combination of accidents takes over.

This idea of Ḍirār bin Amr, which is based on the pile of qualities, is expressed as "bundle theory".[2] This theory has two dimensions: i) ontological and ii) epistemological or phenomenological. Bodies that do not show a complete structure are seen as piles. Epistemologically, bodies that are actually piles appear as a whole by perception. The first dimension of this theory was influential in the production of an atomist idea by Abū al-Hudhayl (d. 235/849) and the tradition that followed it, and the second dimension was effective in the assertion of arguments on issues such as causality and the knowability of good and evil by the Ashʿarites.

2. Naturalist Theologians

Those who argue that objects have a nature in the science of Kalām are called supporters of nature (*ashāb al-tabāiʿ*), and al-Naẓẓām, al-Jāḥiẓ (d. 255/869) and Thumāma b. Ashras (d. 213/828) are considered in this group.[3] Nature, in terms of Kalām, means a quality that requires/provides the realization of the movement in the event that the obstacles are removed. In terms of this approach, it is imperative that objects act in accordance with their own nature without the need for any outside intervention.[4]

First, we can consider al-Naẓẓām's approach to the physical universe. al-Naẓẓām, who spent the first years of his life in Basra, went to Baghdad at the invitation of the Abbasid caliph Maʾmun. al-Naẓẓām, who was as interested in literature as he was in theology, was known among the sixth generation of the Mu'tazila school. From the point of view of al-

[2] Josef van Ess, *The Flowering of Muslim Theology*, trans. Jane Marie Todd (London: Harvard University Press, 2006), 85.

[3] Qāḍī ʿAbd al-Jabbār, *al-Majmūʿ fi al-Muḥīṭ bi al-taklīf*, Compiled by Ibn Mattawayḥ, Critical ed. by ʿUmar al-Sayyid al-ʿAzmī (Cairo: Dār al-Miṣriyya, n.d.), 1/367.

[4] Qāḍī ʿAbd al-Jabbār. *al-Mughnī fī abwāb al-tawḥīd wa al-ʿadl: al-Tawlīd,* Critical edited by Tawfīk al-Tawīl wa Saʿīd Zayid (Cairo: s.n., n.d.), 9/27.

Naẓẓām, who is related to physics both theoretically and practically, the universe consists of three closely related elements: bodies, qualities, and motion. Each of the bodies consists of subcomponents. The subcomponents are divisible infinitely. In terms of this anti-atomist idea, there is no body or part that does not fall into pieces.[5] The idea of anti-atomism accepted by al-Naẓẓām under the influence of Hishām bin Ḥakam has a very important position. When we consider the idea of nature within al-Naẓẓām's anti-atomism, we come across a universe model whose components interact constantly and tend to have a certain purpose in an orderly operation.

In this thought, cold, hot, wet, dry, weight, light, and other countless qualities are all bodies, and they coexist in bodies. The sub-components that make up the objects are different from each other or opposite of each other.[6] Bodies and subcomponents, which continue to divide infinitely, have a nature; each is in motion to reach its nature. Since some of the components strengthen or weaken the others, the nature of the strong components in the main body is effective in the movement. Therefore, there is not a single nature of bodies but an infinite number of natures that wait for an opportunity to come into existence with the formation of suitable conditions. On the other hand, as each component seeks to achieve its purpose (nature), an unpredictably strong tension arises within the body.[7] The infinite division of components further increases this tension.[8] For this reason, al-Naẓẓām says that rest (*sukūn*) is impossible.[9] Even when the objects are thought to be stationary, the tension created by the movements in the opposite direction continues.

al-Naẓẓām expresses this resistance of opposite and different components to each other as the impetus movement (*haraka al-iʿtimād*).[10] According to him, the source of all changes, including moving from one place to another, is the impetus movement.[11] For this reason, it is necessary to divide the movement into two: the impetus movement and the

---

5 Harry Austryn Wolfson, *The Philosophy of the Kalam* (London: Harvard University Press, 1976), 495.

6 al-Jāḥiẓ, *Kitāb al-Ḥayawān*, 5/11-40; Abū al-Hasan al-Ashʿarī, *Maqālāt al-Islāmiyyīn*,- Critical ed. by Nawāf al-Carrāh (Beirut: Dār Sādir, 2008), 184; Abū al-Ḥusayin ʿAbd al-Raḥmān b. ʿUthmān al-Khayyāṭ, *Kitāb al-Intiṣār wa al-radd ʿalā Ibn al-Rāwandī*, Critical ed. by Henrik Samuel Nyberg (Egypt: Dār al-Kutub al-Miṣriyya, 1925), 33; al-Shahristānī, *al-Milal wa al-niḥal* (Beirut: Muʾassasa al-Kutub al-Thaqāfiyya, 1994), 1/42-43; ʿAbd al-Qāhir al-Baghdādī, *al-Farq bayna al-firāk ve beyān al-fırka al-nāciya minhum*, Critical ed. by Muḥammad ʿUsmān al-Husht (Cairo: Maktabatu Ibn Sīnā, 1988), 126; al-Shaykh Al-Mufīd, *Awā'il al-maqālāt*, Critical ed. by Ibrāhim al-Anṣārī (Tahran: al-Muʾtamar al-ʿĀlamī li Alfiyya al-Shaykh al-Mufīd, 1413), 95; Fakhr al-Dīn al-Rāzī, *Muḥaṣṣal afkār al-mutaqaddimīn wa al-mutaʾakhkhirīn min al-ʿulamāʾ wa al-ḥukamāʾ wa al-mutakallimīn*, Critical ed. by Tāha Abd al-Rāʾūf Saʿd (Cairo: Maktaba Kulliyya al-Azhariyya, n.d.), 131; Shlomo Pines, *Madhab al-Dharra ʿinda al-Muslimīn*, trans. Muḥammad Abdu'l-hādī Abū Zayda (Cairo: Maktaba al-Nahda al-Miṣriyya, 1946).

7 al-Ashʿarī, *Maqālāt,* 179, 188, 212; Khayyāṭ, *Kitāb al-Intiṣār*, 45; al-Shahristānī, *al-Milal wa al-niḥal,* 1/43.

8 S. Horovitz, "Ueber den Einfluss der griechischen Philosophie auf die Entwicklung des Kalam" *Jahres-Bericht des Jüdisch-theologischen Seminars Fraenckel'scher Stiftung* (Breslau: s.n. 1909), 18; ʿAbd al-Hādī Abū Rīda, Ibrahim b. Sayyār al-Naẓẓām wa āraʾuh al-kalāmiyya al-falsafiyyah (Cairo: Matbaʿa al-Lajnah al-Ta'līf wa al-Tarjama wa al-Nashr, 1946), 139.

9 al-Ashʿarī, *Maqālāt,* 187, 198; Abū al-Qāsim Al-Kaʿbī, "Bāb dhikr al-Muʿtazila min maqālāt al-Islāmiyyīn," in Faḍl al-iʿtizāl wa Tabaqāt al-Muʿtazila, Critical ed. by Fuad Sayy-(Tunis: al-Dār al-Tūnusiyya li-al-Nashr, 1919), 70-71; Al-Shahristānī, *al-Milal wa al-niḥal*, 1/42.

10 Abū Muḥammed al-Hasan b. Aḥmad Ibn Mattawayh, *al-Tadhkira fī aḥkām al-jawāhir wa al-aʿrāż*, Critical ed. by Daniel Gimaret, Cairo: al-Maʿhad al-Fransī, 2009), 1/531.

11 al-Ashʿarī, *Maqālāt,* 198, 201.

transfer movement (*haraka al-intiqāl*). The first means that the tension of the object in its own space, and the other means that it's moving to another place. The most serious criticism of al-Naẓẓām's anti-atomist theory came from his uncle, Abū al-Hudhayl. Abū al-Hudhayl, who is an atomist, wants to put al-Naẓẓām in a difficult situation by telling how an ant will move from one place to another when the infinite division of objects is accepted, which evokes Zeno's Achilles and the tortoise paradox in the history of philosophy. al-Naẓẓām develops the theory of leap (*ṭafra*) against this objection.[12] According to this theory, when we consider three consecutive locations as A, B, and C, an object can jump from A to C without passing through B. All transfer movements take place in this way. al-Naẓẓām and other theologians later explained this theory by spinning spinner, mills, spinning wheels, and geometric explanations.[13]

For al-Naẓẓām, movement or change takes place not only in accidents such as quality, quantity, time, and space but also in the substance (body and subcomponents).[14] Thinking of movement in substance is a thought that has not been expressed before in the philosophical tradition. Such an idea is not encountered in the tradition that started with Aristotle.[15] With this thought, al-Naẓẓām must have wanted to explain continuous creation within the boundaries of his account of nature. So, according to him, creation means a constant act in which substances are recreated at every moment without being destroyed. al-Naẓẓām does not see any difference between God's creation and the nature of objects causing movements. To put it more clearly, motion by nature is God's creation.[16] Therefore, the constant change in the universe and the constant creation are the same things.

The idea that everything is in constant motion is called "*kumūn* theory". According to this theory, all beings were created at once. Humans, animals, plants, and inanimate objects were created at once, and the majority of things are hidden in others (*kumūn*). Things appear (*ẓuhūr*) as their nature requires them to appear in the presence of suitable conditions. In other words, *kumūn* refers to the existence of the body and its components in a state of tension within itself, and *zuhūr* refers to the movement and change that occur in the body when a suitable opportunity arises.[17]

So, in Naẓẓām's view, we talked about the two elements through which he aims to explain motion. The first is that each of the components that make up bodies has a different nature. The second is the resistance they show against each other due to the tendency of each component to act in accordance with its nature. However, the environment as a third element is also necessary for movement. The environment is a determining factor in al-Naẓẓām's account of motion. al-Naẓẓām gives the example of an

[12] Qāḍī ʿAbd al-Jabbār, *al-Munya wa al-amal*, Compiled by Aḥmad b. Yaḥyā al-Murtaẓa, Critical ed. by ʿUṣām al-Dīn Muḥammād ʿAlī (s.l.: Dār al-Maʻrifa al-Cāmiʿiyya, n.d.), 48.

[13] Josef van Ess, "Ebû İshâk en-Nazzâm Örneği Üzerinden Kelâm-Bilim İlişkisi", trc. Mehmet Bulğen, *Marmara Üniversitesi İlâhiyat Fakültesi Dergisi*, 46 (2014), 274-278.

[14] Ashʿarī, *Maqālāt*, 188; al-Shahristānī, *al-Milal wa al-niḥal*, 1/42.

[15] Aristotle, *Physics*, Edited by Jonathan Barnes Princeton (New Jersey: Princeton University Press, 1991), 226a.

[16] Qāḍī ʿAbd al-Jabbār, *al-Mughnī fī abwāb al-tawḥīd wa al-ʿadl: al-Tawlīd*, 9/27.

[17] al-Jāḥiz, *Kitāb al-Ḥayawān*, 5/11-40, 81-82; al-Baghdādī, *al-Farq bayna al-firāk*, 128-129; al-Shahristānī, *al-Milal wa al-niḥal*, 1/43.

air-filled jumpsuit placed underwater.[18] Accordingly, an air-filled jumpsuit surrounded by water tends to rise upwards. The reason for this tendency is the purpose of the air to reach its source/nature and the reaction brought about by the compression inside. By explaining many specific phenomena in accordance with the theory of *kumūn*, al-Naẓẓām attributes the formation of wind and other weather events in a certain layer between the earth and the sun to the tension in this layer. The digestive system of ostriches[19], evolution[20] the journeys of migratory birds, and homing pigeons are specific phenomena explained by al-Naẓẓām.[21]

al-Jāḥiẓ further developed al-Naẓẓām's thoughts. However, al-Jāḥiẓ's interest in nature is not like that of his teacher al-Naẓẓām or the Muʿtazilite elders who died thirty or forty years before him. al-Jāḥiẓ tries to understand physics issues in an empirical/experimental way. al-Jāḥiẓ was interested in researching natural phenomena. He knew that tides occur due to the movement of the moon.[22] He was aware that thunder and lightning actually happened at the same time, but they were not perceived at the same time due to the speed difference that existed between sound and image.[23]

The success of al-Jāḥiẓ is that he brought al-Naẓẓām's idea of *kumūn* to the experimental field and made it a basis for examining the living conditions of living things. In order to do this, al-Jāḥiẓ considered it his duty to observe the movements of objects and the behavior of animals. For this purpose, he wrote his book called *Kitāb al-Ḥayawān*. This book covers not only the nature and movement of animals but also very different topics, ranging from humour to the importance of writing and speaking. In this book, which also includes frequent references to Aristotle and Galenus, al-Jāḥiz observes snakes, lizards, ants, grasshoppers, and many animals and plants and tries to understand their nature and movements. For example, to learn about the behaviour of mice and scorpions towards each other, he puts them in a jar.[24] In this book, he sometimes criticizes Aristotle's ideas about animals. According to Aristotle's book on animals, the viper dislikes the smell of rue. However, al-Jāḥiz states that he does not notice a distinction between the viper's reaction to rue and other herbs.[25]

al-Jāḥiẓ benefited not only from Aristotle's knowledge of animals but also from his logic. As a matter of fact, he used the concepts of necessary, possible, and impossible, which were included in Aristotle's *Topics*,[26] in the classification of the movement of animals. However, in al-Jāḥiẓ's work, unlike Aristotle, these concepts do not remain on the logical level but come to the fore in making judgments about particular phenomena. He explores the ability of an egg to be fertilized on its own under the influence of

[18] al-Jāḥiẓ, *Kitāb al-Ḥayawān*, 5/42.
[19] al-Jāḥiẓ, *Kitāb al-Ḥayawān*, 4/320-32.
[20] al-Jāḥiẓ, *Kitāb al-Ḥayawān*, 4/73.
[21] al-Jāḥiẓ, *Kitāb al-Ḥayawān*, 3/214-216; 4/320-321.
[22] al-Jāḥiẓ, "Kitāb al-Tarbīʿ ve al-tadvīr", *Rasāʾil* al-Jāḥiẓ*: al-Adabī*, Critical edited by Alī Bū Mulḥim (Beirut: Dār ve Maktaba al-Hilāl, 2004), 466.
[23] al-Jāḥiẓ, *Kitāb al-Ḥayawān*, 4/407.
[24] Maḥfūz ʿAzzâm, *fi al-falsafa al-tabīʿa li al-Jāḥiz* (s.l.: Dār al-Hidāyā, 1995), 22.
[25] al-Jāḥiẓ, *Kitāb al-Ḥayawān*, 5/365.
[26] Aristotle. *Topics* Complete Works, edited by Jonathan Barnes, Princeton, New Jersey: Princeton University Press, 1991), 155b16-155b27, 157b34-158a2.

environmental conditions without a father,[27] as well as whether there is evolution or not.[28] al-Jāḥiẓ, after mentioning the evidence on the subject, states that this is possible by reason, but it is difficult to say that it can happen in reality unless it is experienced. In this context, doubt and experience are clearly visible in al-Jāḥiẓ's works. Accordingly, in a long text that he examined the wings of a mosquito, he states that neither the wing of a mosquito nor any object can be known completely.[29] By stating that doubt inevitably shows itself every time we try to know, al-Jāḥiẓ leads us to the idea that the relevant aspects of an object can be noticed according to our needs and experiences.

As a result, this group, naturalists, does not doubt the necessity of a cause-effect relationship. For them, nature means the principle found in objects, the essence of things, and the target and source of the object. Their interests are not just theoretical. They thought that if we knew the causes and nature of things, we would be close to knowing even if we could not predict the results exactly, and they reflected this approach in their experiences.[30]

It is difficult to determine the Māturīdī account of the universe. There is no clear statement showing that Abū Manṣūr al-Māturīdī (d.333/944), was an atomist. His works clearly show that he has an idea of nature. He explicitly states that objects have a nature; for example, that snow necessarily cools, and that a stone falls downwards due to its nature.[31] However, for him, the movement in things does not occur due to the objects themselves, but through the accidents created in them. Māturīdī holds that these accidents for motion are also nature, and God creates a specific accident, which he calls the accident of permanence (*baqā'*), for the continuity of those accidents. Accordingly, the accident of permanence (*baqā'*) has been created in things so that they can show movement in accordance with their nature.[32] According to Mâturîdî, the realization of natural movement depends on the elimination of the factors that prevent nature.[33]

As it can be understood from here, Abū Manṣūr's idea of nature is different from the approach of naturalist Muʿtazilite thinkers. While the naturalist Muʿtazila theologians see nature as an inseparable part of bodies, Abū Manṣūr sees nature as an accident and attributes its continuity to another accident. Regarding causality, Abū Manṣūr's clear idea does not appear in his works. However, we can say that the cause-effect relationship depends on the continuity of the accident of permanence (*bakā*). In this case, the

---

27 al-Jāḥiẓ, *Kitāb al-Ḥayawān*, 3/376.

28 al-Jāḥiẓ, *Kitāb al-Ḥayawān*, 1/311-312; 4/98; 4/73; Mehmet Bayrakdar, *İslam'da Evrimci Yaratılış Teorisi* (Ankara: Kitabiyat Yayınları, 2001), 47-59.

29 al-Jāḥiẓ, *Kitāb al-Ḥayawān*, 1/208-209.

30 al-Jāḥiẓ, "al-Maʿāsh we al-maʿād", *Rasāʾil al-Jāḥiẓ*, Critical edited by ʿAbd al-Salām Muḥammad Hārūn (Cairo: Maktaba al-Khanjī, 1964), 121; *Kitāb al-Ḥayawān*, 3/373.

31 Abū Manṣūr Muḥammad al-Māturīdī, *Kitāb al-Tawhīd*, Critical edited by Bekir Topaloğlu & Muhammed Aruçi (Beirut: Dâru Sâdır, 2001), 184; al-Māturīdī, *Taʾwīlāt al-Qurʾān*, Critical edited by Bekir Topaloğlu (İstanbul: Mizan Yayınevi, 2005-2011), 17/158; Alnoor Dhanani, "al-Māturīdī and al-Nasafī and the Tabā 'ī'", *Büyük Türk Bilgini İmâm Mâtürîdî ve Mâtürîdîlik Milletlerarası Tartışmalı İlmî Toplantı* (İstanbul: Marmara Üniversitesi İlâhiyat Fakültesi Yayınları, 2012), 72; Yusuf Şevki Yavuz, "Mâtürîdî'nin Tabiat ve İlliyete Bakışı", *Büyük Türk Bilgini İmâm Mâtürîdî ve Mâtürîdîlik Milletlerarası Tartışmalı İlmi Toplantı* (İstanbul: Marmara Üniversitesi İlahiyat Fakültesi Yayınları 2012), 56.

32 al-Māturīdī, *Kitāb al-Tawhīd*, 80.

33 al-Māturīdī, *Kitāb al-Tawhīd*, 184.

occurrence of the result is still in the category of possibility. Finally, let's say that there is no harmony between Abū Manṣūr al-Māturīdī and his followers in terms of theoretical physics. The followers of Abū Manṣūr adopted an approach close to the Ashʿarī theologians' conception of the universe, who were atomists and generally did not accept nature in matters of physics.

3. Atomist Theologians

In the history of Kalām, atomism emerged contemporaneously with naturalism as an opposite approach. For atomist theologians, a divisible body cannot be divided infinitely. There is a particle where the division will no longer occur. The theologians named this particle the indivisible particle (*juzʾun lā yetecezzāʾ*) or the unique substance (*al-javhar al-wahīd*). This approach rejects the idea that objects have a nature.[34] Many Mu'tazilī scholars such as Abū al-Ḥudhayl al-ʿAllāf (d. 235/849) Hishām al-Fuwātī (200/813), ʿAbbād b. Sulaymān (d.250/864), Abū ʿAlī al-Jubbāʾī (d.303/916), Abū Hāshim al-Jubbāʾī (d. 321/633), Qādī ʿAbd al-Jabbār (d. 415/1025), al-Nīsābūrī (d. 415) /1024), Ibn Mattawayh (d. 469/1076) and Ashʿarī theologians such as al-Ashʿarī (d. 324/935) al-Bāqillānī (d. 403/1013), Ibn Furak (d. 406/ 1015), al-Baghdādī (d. 429/1037), al-Juwaynī (d. 478/1075) and many others are atomists despite their different views on particular issues. In fact, we can easily say that this is the most common approach as a paradigm of theoretical physics in Kalām.

In terms of the history of Kalām, atomism begins with Abū al-Ḥudhayl al-ʿAllāf. According to him, a body cannot be divided infinitely. There is an end to dividing a body into parts. Atoms have neither length, width, nor depth when they are alone. Bodies are formed by the combination of at least six atoms. Thus, Abū al-Ḥudhayl al-ʿAllāf rejects the involment of space in atoms when they are alone. Another of the fundamental points of his atomist thought is that he denied that atoms, when alone, have any accidents other than motion and stability. Therefore, according to him, atoms have no color, smell, power, or knowledge. These qualities, which are expressed as accidents, come into existence after the bodies are formed by the combination of atoms.[35]

The atomist thought of Abū al-Ḥudhayl al-ʿAllāf was accepted, with some changes, by ʿAbbād b. Sulaymān, Abū ʿAlī al-Jubbāʾī, Abū Hāshim al-Jubbāʾī, Qādī ʿAbd al-Jabbār and many other Mu'tazilite thinkers.[36] Abū ʿAlī al-Jubbāʾī made some revisions and argued that even the atom, which was alone, would have some permanent accidents. Still, he accepted the characteristic attitude of atomism by holding that substances do not have properties originating from them.[37]

---

[34] al-Ashʿarī, *Maqālāt,* 175-176, 178, 182, 187, 202-203, 205; ʿAlī Sāmī al-Nashshār, *Nashʾatu al-fikr al-Islāmī* (Cairo: Dār al-Maʿārif, n.d), 1/471-472.

[35] al-Ashʿarī, *Maqālāt,* 175-176, 178, 182, 187, 202-203, 205; al-Nashshār, *Nashʾatu al-fikr al-Islāmī*, 1/471-472.

[36] Alnoor Dhanani, *The Physical Theory of Kalam Atoms, Space, and Void in Basrian Mu'tazilī Cosmology* (Leiden, New York, Köln: E. J. Brill, 1994), 90-141; Josef van Ess, *The Flowering of Muslim Theology*, trans. Jane Marie Todd (London: Harvard University Press, 2006), 79-117.

[37] al-Āmidī, *Abkār al-afkār fī uṣūl al-dīn*, Critical edited by Aḥmad Muḥammad al-Mahdī (Cairo: Dār al-Kutub, 2004), , 3/247.

In the ninth century, the Muʿtazilī atomism was carried further and reached the conclusion that there are voids between atoms.[38] According to the atomist Muʿtazila, it is not possible for two bodies to exist in the same place and time, which brings us to the idea of the void.[39] The existence of the void has been attempted to be clarified by the Muʿtazila through examples such as overalls, water bottles, water clocks, cupping glasses, and many more.[40] Abū Isḥāq b. ʿAyyāsh (d. 386/996) expresses the existence of the void based on the immersion of the bottle in water as follows:

A bottle with a narrow mouth, after the air inside, is sucked, closed with the thumb, and immersed in water, and when the thumb is pulled, the water enters the bottle without making a sound. If there was air, the sound that the water would make would be heard due to the pressure created when the water entered the bottle. Since the sound of water is not heard, we can be sure that there is no air left in the bottle. Since air is taken from the bottle, the sound is not heard. Thus, it is concluded that the air inside comes out of the bottle and there is a void in the bottle.[41]

The rejection of the idea of nature has led atomist theologians to different alternative solutions. This school developed the theory of impetus (*iʿtimād*) because they rejected the objects to perform a movement originating from them and thought that the physical process should be explained in a reasonable way. This concept or theory is important for this school because only in this way they did hope to explain a reasonable causality, an appropriate idea of creation, and the freedom of man in his actions. Ibn Mattawayh expresses this concept in a suitable definition as follows: "iʿtimād is the reason that makes the place push or pull in the absence of any obstacles."[42] As can be seen, this definition is almost the same as Aristotle's definition of nature in *Physics*.[43] The difference is that in this definition, "iʿtimād" is used instead of nature. This similarity shows that iʿtimād has a function similar to nature. The meaning of the concept of "iʿtimād" changes according to the approaches of the theologians. This concept is understood as weight, lightness, humidity, contact, resistance, the inclination of objects, and inner impulse or the cause that provides them. In this study, we will use the word "impetus" instead of "iʿtimād". Supporters of this theory often say that there are two kinds of impetus. The first is the impetus, which continues in the bodies and corresponds to the principle that natural theologians call "nature", and they call it "the internal impetus" (*al-iʿtimād al-lāzim*). The second is a power that is non-continuous and imparted to objects from the outside. They call it "the external impetus" (*al-iʿtimād al-mujtalib*).[44] If we explain through the example of throwing the stone upwards, it is the external impetus that makes the stone rise, while the internal impetus makes the stone fall down.

[38] Abū Rashīd Al-Nīsābūrī, *fi al-tawḥīd diwān al-uṣūl*, Critical edited by Muḥammad ʿAbd al-Hadī Abū Rīda (Egypt: Maṭbaʿa Dār al-Kutub), 37, Ahmet Mekin Kandemir, *Mu'tezilî Düşüncede Tabiat ve Nedensellik* (İstanbul: Endülüs Yayınları, 2019).

[39] Ibn Mattawayh, *al-Tadhkira fi aḥkām*, 1/47.

[40] Ahmet Mekin Kandemir, "The Hand Extending Beyond the Cosmos: Discussions on the Khalāʾ [Void] Between the Baṣran and Baghdād Schools of Muʿtazila", *Nazariyat* 7/1 (2021), 1-36.

[41] Ibn Mattawayh, *al-Tadhkira fi aḥkām,* 1/48.

[42] Ibn Mattawayh, *al-Tadhkira fi aḥkām*, I, 309.

[43] Aristotle, *Physics*, 193a-193b.

[44] Qāḍī ʿAbd al-Jabbār, *al-Mughnī fi abwāb al-tawḥīd wa al-ʿadl: al-Tawlīd*, 9/28.

Muʿtazila theologians do not agree on the essence of the impetus. There are serious arguments between them. The biggest debate on this issue took place in the Jubbāʾī family (Abū ʿAlī and Abū Hāshim).[45] According to Abū ʿAlī al-Jubbāʾī, motion does not occur due to quality or power in the object, but due to another motion applied to the object. Accordingly, it is not impetus that requires the stone to rise but that it has been thrown. Abū ʿAlī sees impetus as one of the reasons for action, but not the only source of action. For this reason, he does not divide the impetus into two parts: internal and external. Because, from his point of view, it is not an impetus that exists permanently in an object and moves its object but an impetus that is gained during each movement. However, Abū Hāshim al-Jubbāʾī's view differs from his father, Abū ʿAlī. According to him, it is the external impetus that enables an object to rise, but after reaching a certain level, it is the internal impetus that causes the stone to fall with the exhaustion of the external impetus.[46] Accordingly, from the point of view of Abū Hāshim, impetus necessarily causes motion in bodies.[47]

In the context of the floating and sinking of objects, the discussion between the father and the son can make the impetus more understandable. According to Abū ʿAlī al-Jubbāʾī, the reason why objects stay on the surface of the water is that the air pulls them upwards. Air passes through the gaps in objects and pulls them upwards. The objects sink when the air cannot pass between or through the objects. The explanation of Abū Hāshim al-Jubbāʾī about the objects remaining on the surface of the water and sinking is different. According to Abū Hāshim al-Jubbāʾī, the impetus of the object on the water surface and the impetus of the water are different. When the impetus in the water is prevented from making a suitable movement, it will inevitably move differently from its own impetus. In such a case, when the object encounters water, the water pushes it. Thus, the two forces collide. While the impetus of the object causes downward movement, the impetus of the water causes movement in the opposite direction. Hence, the orientation of the object remains between two different movements. By this explanation, Abū Hāshim means the following: Water with a downward impetus tends downward, encounters an obstacle, and acquires an upward impetus. The object on the surface tends downward with its internal impetus and encounters the upward external impetus of the water. Two impetuses in opposite directions keep the objects on the surface. Abū Hāshim al-Jubbāʾī explains sinking as follows: If the impetus of the object on the surface is greater than the impetus of the water, the object will sink.[48]

These explanations of physical phenomena may not have the conditions of being scientific in today's sense because the theologians did not experiment with the examples mentioned here. However, Abū Hāshim al-Jubbāʾī tries to express different phenomena, such as swimming and sinking within some general principles. Therefore, it is not correct to interpret this experience of physical phenomena as purely speculative explanations. It is unfair to see them as an argument for some theological assumptions and push them entirely into the theological field. Besides experimentation, another criterion of

[45] al-Āmidī, *Abkār al-afkār*, 3/247.
[46] al-Āmidī, *Abkār al-afkār*, 3/247.
[47] al-Āmidī, *Abkār al-afkār*, 3/247.
[48] Ibn Mattawayh, *al-Tadhkira fī aḥkām*, 1/356.

scientificity is seen in the utilization of mathematics: the quantification of motion or another physical phenomenon. In the example below, there is an attempt at the mathematization of quantifying subject-matter.

Ibn Mattawayh explains Abū Hāshim's idea of rising and falling with mathematical expressions and explains the impetus with numerical data as follows: Let us assume that an object's internal impetus in the direction of falling is 100 units and it is thrown upwards with 1000 units of external impetus. First, the external impetus decreases by 100 units to 900, then to 800, and finally to 100 units. On the other hand, the internal impetus, which provides the drop, remains constant at 100 units in this process. Finally, the internal impetus and the external impetus become equal, and the stone begins to fall.[49] In general, Muʿtazilite theologians say that the rise will continue until the ascending and downward impetus are equal, in the case of equivalence, a short-term stagnation occurs in the stone, and when the downward impetus predominates, the stone will fall.[50]

There are also other Muʿtazilite theologians who establish a relationship between air density and the rise and fall of objects. One of them is Qādī Abd al-Jabbār. According to him, in addition to the internal impetus, the effect of the weather should be taken into account in the falling back of the stone. The impact of the air on the stone from the front, right and left reduces the speed of the stone's descent.[51] While Qādī Abd al-Jabbār generally agrees with Abū Hāshim's thoughts on the movement, he makes an important explanation about the effect of the weather. Abū Hāshim says that the speed of an object falling off a high place decreases right before it touches the ground. According to him, the reason for the decrease is the decrease in the effect of internal impetus.[52] However, according to Qādī Abd al-Jabbār, the reason is the increase in air density. In this case, the force created by the air density reduces the force of the falling object from above.

As it is seen, although we can not say that the movement is fully quantified in the statements of Abū Hāshim, we can talk about the existence of an attempt in this direction. In addition to this explanation made by neutralizing the effect of external conditions, the explanations made by considering the density difference of the air of the same phenomenon were also made by the Muʿtazila. It has been stated that the density difference that occurs in the air as it rises from the ground decreases the internal impetus of the stone and the fact that the birds fly not close to the ground but at higher altitudes is shown as evidence of the density difference in the different layers of the air.[53]

In order to show the interest of the atomist theologians in the impetus of the objects, it is useful to give the explanations made in the context of the hanging scale, which is a steelyard balance with a long bar (or beam Ar. *ʿamūd*). The bar is held by a pivot/lever creating two unequal arms: the long arm has a fixed weighted knob (arm A), and the short arm has an empty pan (arm B). Ibn Mattawayh explains the movement of the scale as follows: When we put an object with weight on the pan of the scale, the arm with the knob

[49] Ibn Mattawayh, *al-Tadhkira fī aḥkām*, 1/352.

[50] Imām al-Ḥaramayn al-Juwaynī, *al-Shāmil fī usūl al-dīn*, Critical edited by ʿAlī Sāmī al-Nashshsār (Alexandria: Manṣaʾatu al-Maʿārif, 1969), 507.

[51] al-Juwaynī, *al-Shāmil fī usūl al-dīn*, 507.

[52] Qāḍī ʿAbd al-Jabbār, *al-Mughnī fī abwāb al-tawḥīd wa al-ʿadl: al-Tawlīd*, 9/148-149.

[53] Ibn Mattawayh, *al-Tadhkira fī aḥkām*, 1/352.

(the arm A) lifts. It is because a heavy object creates movement in the direction appropriate to its weight. Since the object is prevented from moving downwards due to the pan and ties, it creates an impetus in the opposite direction, and the arm A rises. When the knob is slid far from the pivot, the arm A stops rising, and the power of the knob decreases from the power of the object on the pan. In other words, moving the knob far from the pivot balances the object on the pan so that the motion comes to a halt. However, the total weight of the arm A is not equal to the total weight of the arm B, which includes the weights of the arms on two sides. Ibn Mattawayh tries to understand the reason that prevents the arm A from rising. According to him, it is certain that weight solely is not the reason why the arm A stops rising because each side of the pivot has different weight. Ibn Mattawayh is not sure about the explanation given in such a situation. Although he says it is necessary to find the real reason for what balances the sides of the pivot and makes the entire bar come to a halt, he does not explain further.[54]

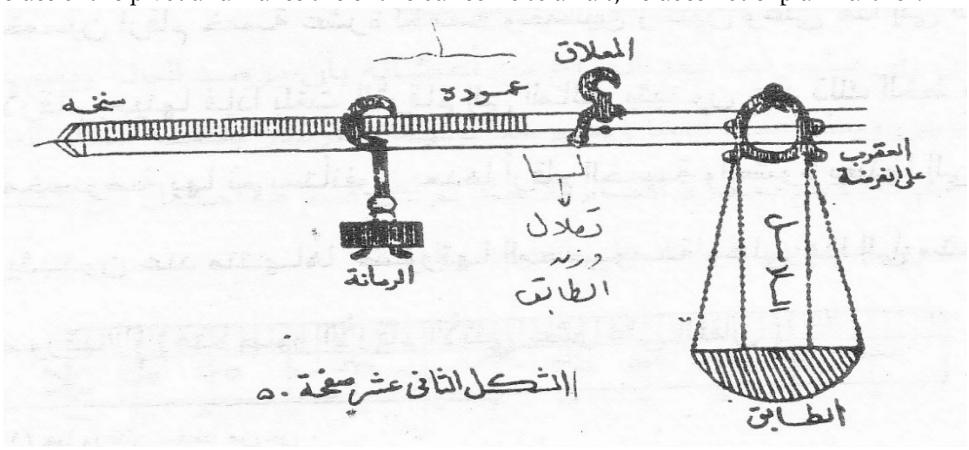

Figure 1: Hanging Scale [55]

We cannot see the idea of impetus as the same as the idea of nature. Regarding the idea of nature, motion originates from the object's location.[56] In other words, objects perform a movement in accordance with their nature without any outside intervention. In this sense, naturalist theologians think that God's actions also occur as a requirement of the nature of the locality.[57] Abū ʿAlī al-Jubbāī's idea of impetus does not allow objects to produce motion without the need for an external motion. In this respect, his thought is very far from the thought of naturalist theologians. However, Abū Hāshim's idea of impetus necessitates the impetus in objects to produce motion alone.[58] From this point of view, Abū Hāshim's idea of impetus and the naturalists' idea of nature are very close. However, Abū Hāshim thinks that God gave the impetus to the bodies later.

[54] Ibn Mattawayh, *al-Tadhkira fī aḥkām*, 1/357.

[55] The figure was taken from ʿAbd al-Raḥmān al-Khāzinī (XII. century), *Kitāb al-Mizān al-Ḥikma* (Ḥaydarābād: Dāira Mʿārif al-ʿUsmaniyya, Ḥ. 1359), 51.

[56] Qāḍī ʿAbd al-Jabbār, *al-Mughnī fī*, 9/27.

[57] Qāḍī ʿAbd al-Jabbār, *al-Mughnī*, 9/27.

[58] Qāḍī ʿAbd al-Jabbār, *al-Mughnī*, 9/149-150.

The lateness of the impetus does not mean absolute arbitrariness for them. This power is attributed to secondary causes such as weight, humidity, contact, and proximity. In addition, he thinks that the movement in the objects that occurs with the internal impetus can also be achieved with other types of impetus. Accordingly, an action different from the results of the internal impetus can be brought about by God.[59] However, this different movement can be through the creation of acquired different impetus. In this case, God's will is realized for understandable reasons. In terms of these aspects, the idea of impetus differs from the idea of nature. The atomist Muʿtazila find the idea of nature incomprehensible and inadequate. According to them, the idea of nature can explain the orientation of a body in many directions. However, it can never explain its allocation in a particular direction. The idea of impetus, on the other hand, explains both the apparent orientation of objects in many directions in terms of time and space and the allocation of one of them.[60]

Abū al-Hasan al-Ashʿarī (d. 324/935) and his followers accepted Abū ʿAlī al-Jubbāʾī's account of the atomistic universe and held that atoms have voids and take up space even when they are alone. According to this, atoms are not only objects of thought but also exist as a reality. Together, the combination of atoms and accidents, such as colour, formation, smell, and taste, form objects. It is unthinkable for objects to be devoid of accidents. The Ashʿarites insist that an accident cannot exist at two separate times since they insist that accidents are non-continuous. Thus, they want to explain God's creation of different accidents in bodies at different times. They do not accept the effect of any quality found in objects on the occurrence of motion. For this reason, they reject the idea of nature and the impetus put forward by Abū Hāshim. However, they support the idea of impetus put forward by Abū ʿAlī al-Jubbāī.[61]

4. Atomist and Naturalist Theologians

Muʿammar b. Abbād (d. 215/830) and the theologians of the Baghdad Muʿtazila school can be evaluated in the group in which atomistic and naturalistic accounts are synthesized. Although Muʿammar and the Baghdad Muʿtazila school agree with each other in terms of the idea of atomism and nature, they have quite different positions in terms of the conception of the universe. Muʿammer's name is mentioned among the supporters of nature. However, since he considers naturalism with atomism, it would be useful to include him here.[62] Muʿammar had a good friendship with al-Naẓẓām. He was a theologian and physician.[63] Muʿammer supports the idea of atomism. According to him, qualities such as length, width, and depth occur when atoms come together and form objects.[64] He says that bodies consist of at least eight atoms. He explains the motion that occurs in bodies with their nature.[65] Accordingly, Allah has created bodies with a nature that causes their

[59] Qāḍī ʿAbd al-Jabbār, *al-Mughnī*, 9/94.
[60] Qāḍī ʿAbd al-Jabbār, *al-Mughnī fī*, 9/27.
[61] al-Juwaynī, *al-Shāmil*, 508; al-Āmidī, *Abkār al-afkār*, 3/247.
[62] Qāḍī ʿAbd al-Jabbār, *al-Majmūʿ fi al-Muḥīṭ bi al-taklīf*, 1/386-388; Al-Shahristānī, *al-Milal wa al-niḥal,* 1/48.
[63] al-Jāḥiz, *Kitāb al-Ḥayawān*, 1/55, 56; 2/140; 4/423, 425; 5/393, 396.
[64] al-Ashʿarī, *Maqālāt,* 176.
[65] al-Ashʿarī, *Maqālāt,* 215, 228, 232, 240, 315.

actions. All accidents, movements, and changes occur by nature in bodies. The agents of these movements are the bodies themselves.[66]

We can include the thoughts of Abū al-Qāsim al-Balkhī al-Kaʿbī (d. 319/931) in this group. He is an atomist and naturalist. Kaʿbī refers to the geometrical explanations in Euclid's work and Aristotle's *De Caelo* (*al-Samāʾ we al-ʿĀlam*) to explain the idea of atomism. Accordingly, geometrically, a point has no parts. A line can be partitioned longitudinally but not transversely, which indicates that there is a non-fragmented particle.[67] al-Kaʿbī envisions the universe as a space filled with atoms. He thinks that colour, taste, smell, temperature-coldness, and humidity-dryness are accidents and are always connected to atoms. As a result, bodies have particular natures that determine them so that they can move in a certain way. For example, wheat has a unique nature. As long as this quality is present, it is not possible to form barley from wheat. It is impossible for God to create any living thing other than a human embryo as a requirement of nature. Nature is the powerful and decisive cause placed in bodies. For example, fire has natural flammability and burning properties. Natures are the properties created by God in bodies for motion to occur. They accept that nature in objects necessarily causes motion. Therefore, the Muʿtazila of Baghdad does not accept the idea of impetus.

The Baghdad Muʿtazilites claim that there is no void in the universe, and they try to support their approach with the cupping process: When the cup of cupping is placed on two veins and the air is drawn, the meat rises. This is because there is no void in the universe. So, meat replaces the extracted air.[68] Another example given by the Muʿtazila of Baghdad to prove that there is no void is related to the correction of fractures and dislocations. Based on this example, when the bonesetter wants to fix the broken bones, he puts some dough on the broken bone, applies a little fire around it, and then positions a cup on it. Thus, the air inside the cup warms up and leaks out through the rim of the cup. As the air rises, the fire rises, and as the fire rises upward, the bone accompanies it. Thus, the bone takes its place. According to them, this cupping process works because the universe has no void.[69]

5. Evaluation of the Universe with the Theory of Four Causes

Ashʿarite theologians before Ghazzālī (d. 505/1111) revised the Muʿtazila's theory of the universe based on atoms and accidents. However, together with Ghazzālī, but mostly Fakhr al-Dīn al-Rāzī (d. 606/1210) and his successor al-ʿĪjī (756/1355), al-Ṭaftāẓānī (d. 792/1390), al-Jurjānī (d. 816/1413) and, in summary, the second classical period theologians adapted the Peripatetic (especially Avicenna) physics theory based on Aristotle's ontology to their own paradigms. Although we cannot argue that the Ashʿarites abandoned the ideas of atomism completely, those ideas do not seem to come up in the new period as much as they did in the first classical period. Instead, concepts such as matter-form, four causes (material cause, formal cause, efficient cause, final cause), proximate cause, distant cause, and nature began to shape the Ashʿarites' conception of

[66] al-Ashʿarī, *Maqālāt,* 315; Khayyāṭ, *Kitāb al-Intiṣār,* 54; Al-Shahristānī, *al-Milal wa al-niḥal,* 49.
[67] Ibn Mattawayh, *al-Tadhkira fi aḥkām*, 1/75; Dhanani, *The Physical Theory of Kalam*, 178-149.
[68] Ibn Mattawayh, *al-Tadhkira fi aḥkām*, 1/50.
[69] Ibn Mattawayh, *al-Tadhkira fi aḥkām*, 1/50-51.

the universe.[70] In order to harmonize the concepts of kalām physics they inherited with the physics of the new period, the Ashʿarites (i) transformed the content of the concepts and (ii) produced new concepts such as complete cause and incomplete cause. (iii) On the other hand, they have moved causality from the cosmological sphere to the epistemological realm. It is possible to find this approach of the Ashʿarites clearly in their thoughts about nature. Ghazzālī and later Ashʿarites accept the idea of nature.[71] However, they do not regard nature as a permanent essence in bodies but as a quality that God can always change.[72] For this reason, they do not think that the nature of bodies requires appropriate movement. We can continue to evaluate the harmonization practices in the classical and new eras by explaining the reason for creating the concept of complete cause. The complete cause is the combination of all the causes that led to the result. Accordingly, no cause can be effective without these reasons coming together.[73] From this point of view, depending on the theory of four causes accepted in Aristotelian physics, every one of the four causes -material cause, formal cause, efficient cause, and final cause- is accepted as a cause, and the combination of all these is considered the complete cause.[74] We can explain four causes with the example given by al-Jurjānī. When we think of a sofa, The idea of sofa expresses the formal cause, the wood is the material cause, the carpenter is an efficient cause, and the intention that leads the carpenter to make this sofa expresses the final cause.[75] The concept of complete cause, which was not on the agenda of theologians until the thirteenth century, started to be used frequently due to the demand to make the Avicenna causality idea compatible with the idea of God's custom. Thus, the concept of the complete cause was not limited to physics and metaphysics but became an effective concept in Islamic thought.[76]

Another change that ensures the harmony of Avicenna physics with the theses of the Ashʿarites is the withdrawal of causality from the cosmological order to the epistemological plane. Although before al-Juwaynī, the cause-effect relationship was meant to be related to external reality, al-Juwaynī concluded that this relationship was mental. From the point of view of al-Juwaynī, the relationship between conditions and results is a relationship that takes place in the mind and enables the agent to make a judgment.[77] This explanation of al-Juwaynī, who sees the problem of causality as an epistemological rather than an ontological one, determined the fate of all Ashʿarite theology after him. As a matter of fact, in Fakhr al-Dīn al-Rāzī the causal relation is a

[70] İbn Sînâ, *Kitabu'ş-Şifa: Fizik,* trc. Muhittin Macit-Feruh Özpilavcı (İstanbul: Litera, 2004); 1/69; Abū Hāmid al-Ghazzālī, *Miʿyar al-ilm*, Critical edited by Ahmad Shamsaddīn (Beirut: Dār al-Kutub al-ʿIlmiyyah, 2013) 319-320; Fakhr al-Dīn al-Rāzī. *Sharh Uyūn al-hikma*, Tahran: Muassasah al-Sādık, 1415, 3/47.

[71] al-Ghazzālī, *Miʿyar al-ilm*, 289-290.

[72] Fakhr al-Dīn al-Rāzī. *at-Tafsīr al-kabīr*, Beirut: Dār al-Fikr, 1981, 14/149; 25/53.

[73] Sayyid Sharīf al-Jurjānī ʿAlī b. Muhammed, *Sharḥ al-Mawāqıf*, Critical edited by Maḥmūd Ömer ed-Dimyātī (Beirut: Dāru al-Kutub al-ʿİlmiyya, 1998). 4/104-110; Muhammet Fatih Kılıç, "The Emergence of the Distinction between Complete and Incomplete Causes from Avicenna to al-Abharī ", *Nazariyat Journal for the History of Islamic Philosophy and Sciences*, 4/1 (2017), 63-85.

[74] al-Jurjānī, *Sharḥ al-Mawāqıf,* 4/104-110.

[75] al-Jurjānī, *Sharḥ al-Mawāqıf,* 4/104-110.

[76] ʿAbd al-ḥakīm Siyālkūtī, "Ḥāşiyā ʿalā ḥāşiyā ʿAbdilghafūr Lārī", *al-Majmuʿa al-Nūriyya*, Critical edited by Muḥammad Nūrī Nas, Midyat: Dâru Nur al-Sabāḥ, 2010), 1/97.

[77] al-Juwaynī, *al-Shāmil*, 110.

function of the mind. In al-ʿĪjī (d. 756/1305) and al-Jurjānī (d. 816/1413), "the object of knowledge" (*maʿlūm*) and existence (*mawjūd*) have the same meaning.[78] The following sentence, uttered by al-ʿĪjī to show the relationship between cause and effect, reveals the point of Ashʿarism physics: "It is imperative to consider the need of one thing for another."[79] As it can be understood from here, a causal relationship should be considered mental in terms of the elements needed, not extramental, which is to say, in nature. In the ontology sections of the thirteenth century and later theologians' texts, it is not possible to find experiential examples in the explanations of the physical universe. Although there are examples based on experience in these texts, these are explanations produced by the theologians in previous periods.

Conclusion

Kalām's experience of relating to the physical universe differs periodically. At the beginning of the ninth century, it is seen that theologians, in addition to developing physical theories, took natural reality into account, made observations, and started to draw some conclusions from natural life. It cannot be said that these works of theologians adequately carry the criterion of experimentation in the current sense because it lacks the basic criteria of experimentation, such as putting forward hypotheses and classifying variables. However, it is understood that the theologians of this period were not content with only speculative explanations, they were interested in animals, plants, minerals and mines, which are the components of the natural environment, and they were in an effort to reach some conclusions based on this.

In the tenth and eleventh centuries, theologians, who needed to clarify their metaphysical theses and develop an appropriate physical approach, explained many particular phenomena, such as atom, void, and impetus. Some of them include cupping cups, correction of broken dislocations, objects floating on water, movement of objects thrown upwards, and the way the scale works. These explanations are not based on the practice of experimenting specifically but on the interpretation of a particular phenomenon chosen as a representation in accordance with the theological approach. However, the fact that theologians felt obliged to explain these phenomena shows that they needed to establish a connection with the natural process. Moreover, the fact that they get support from geometry in the proof of atomism and that they quantify the movements of rising and falling indicates an attempt to mathematize their examples, which is a criterion of scientificity.

The incorporation of Aristotelian physics, metaphysics, and logic into Kalām in the twelfth century and later and harmonizing them with theological theses provided the theoretical opening of Kalām to a new and comprehensive field. However, this expansion necessitated that Kalām be disconnected from stone, soil, animal, and plant, in short, from the natural environment, and to have a physics approach only on a theoretical and nominal level. Thus, in the ninth century, Kalām physics, which included synthetic orientations, was drawn to an analogical approach in the tenth and eleventh centuries and to an analytical universe in which formal logic determined its framework in the thirteenth century and later.

[78] İbn Sînâ, *Kitabu'ş-Şifa: Fizik,* 1/69; al-Jurjānī, Sh*arḥ al-Mawāqıf*, 4/104-110.

[79] Aḍud al-dīn al-Ījī, *al-Mawāqif fī 'ilm al-kalām* (Beirut: A'lam al-Kutub, n.d.), 85.

References

Abū Ridā, ʿAbd al-Ḥādi. *Ibrahim b. Sayyār al-Naẓẓām wa ārāʾuh al-kalāmiyya al-falsafiyya*. Cairo: Matbaʿa al-Lajnat al-Ta'līf wa al-Tarjama wa al-Nashr, 1946.

al-Āmidī, Sayf al-Dīn. *Abkār al-afkār fī uṣūl al-dīn*. Cairo: Dār al-Kutub, 2004.

Aristotle. *Physics*, *Complete Works (Aristotle)*. edited by Jonathan Barnes. Princeton, New Jersey: Princeton University Press, 1991.

Aristotle. *Topics*, *Complete Works (Aristotle)*. edited by Jonathan Barnes. Princeton, New Jersey: Princeton University Press, 1991.

al-Ashʿarī, Abū al-Ḥasan. *Maqālāt al-Islāmiyyīn*. Critical edited by Nawāf al-Jarrāḥ. Beirut: Dār al-Ṣādr, 2008.

ʿAzzâm, Maḥfūz. *fi al-Falsafa al-tabīʿa li al-Jāḥiz*. s.l.:Dāru al-Hidāyā, 1995.

al-Baghdādī, ʿAbd al-Qāhir. *al-Farq bayna al-firāk ve bayān al-fırka al-nāciya minhum*. Critical edited by Muḥammad ʿUsmān al-Husht. Cairo: Maktabatu İbn Sīnā, 1988.

Bayrakdar, Mehmet. *İslam'da Evrimci Yaratılış Teorisi*. Ankara: Kitabiyat Yayınları, 2001.

Cengiz, Yunus. *Doğa ve Öznellik Câhız'ın Ahlâk Düşüncesi.* İstanbul: Klasik Yayınları, 2015.

Demir, Osman. *Kelâmda Nedensellik: İlk Dönem Kelâmcılarında Tabiat ve İnsan*. İstanbul: Klasik Yayınları, 2015.

Dhanani, Alnoor. "al-Māturīdī and Al-Nasafī and the Tabā 'ī'". *Büyük Türk Bilgini İmâm Mâtürîdî ve Mâtürîdîlik Milletlerarası Tartışmalı İlmî Toplantı*. İstanbul: Marmara Üniversitesi İlâhiyat Fakültesi Yayınları 2012.

Dhanani, Alnoor. *The Physical Theory of Kalam Atoms, Space, and Void in Basrian Mu'tazilî Cosmology*. Leiden, New York, Köln: E. J. Brill, 1994.

Frank, Richard. *Beings and Their Attributes: The Teaching of the Basrian School of the Mu'tazila in the Classical Period*. Albany: The State University of New York Press, 1978.

al-Ghazzālī, Abū Hāmid. *Miʿyar al-ilm*. Critical edited by Ahmad Shamsaddīn. Beirut: Dār al-Kutub al-ʿIlmiyyah, 2013.

Horovitz, S. "Ueber den Einfluss der griechischen Philosophie auf die Entwicklung des Kalam". *Jahres-Bericht des Jüdisch-theologischen Seminars Fraenckel'scher Stiftung.* Breslau: s.n., 1909.

Ibn Mattawayh, Abū Muḥammad al-Hasan b. Aḥmad. *al-Tadhkira fī aḥkām al-jawāhir wa al-aʿrāż*. Critical edited by Daniel Gimaret. Cairo: al-Ma'ḥad al-Fransī, 2009.

İbn Sînâ. *Kitabu'ş-Şifa: Fizik*. çev. Muhittin Macit-Feruh Özpilavcı. İstanbul: Litera Yayınları, 2004.

al-Ījī, Aḍud al-dīn. *al-Mawāqif fī 'ilm al-kalām*. Beirut: Aʿlam al-Kutub, n.d..

al-Jāḥiẓ, ʿAmr b. Baḥr. *Kitāb al-Ḥayawān*. Critical edited by ʿAbd al-Salām Hārūn. Cairo: Jamʿiyya al-Riʿāya al-Mutakāmila, 2004.

al-Jāḥiẓ, ʿAmr b. Baḥr. "al-Maʿāsh we al-maʿād". *Rasāʾil al-Jāḥiẓ*. Critical edited by ʿAbd al-Salām Muḥammad Hārūn. Cairo: Maktaba al-Khanjī, 1964, 91-134.

al-Jāḥiẓ, ʿAmr b. Baḥr. "Kitāb al-Tarbīʿ ve al-tadvīr". *Rasāʾil al-Jāḥiẓ: al-Adabī.* Critical edited by Alī Bū Mulḥim. Beirut: Dār ve Maktaba al-Hilāl, 2004, 429-490.

al-Jurjānī, Sayyid Sharīf ʿAlī b. Muhammad. *Sharḥ al-Mawāqıf*. Critical edited by Maḥmūd ʿUmar ed-Dimyātī. Beirut: Dāru al-Kutub al-ʿİlmiyya, 1998.

al-Juwaynī, Imām al-Ḥaramayn. *al-Shāmil fī usūl al-dīn*. Critical edited by ʿAlī Sāmī al-Nashshsār. Alexandria: Manshaʾatu al-Maʿārif, 1969.

al-Kaʿbī, Abū al-Qāsim. "Bāb dhikr al-Muʿtazila min maqālāt al-Islāmiyyīn". *Faḍl al-iʿtizāl wa tabaqāt al-Muʿtazila.* Critical edited by Fuad Sayy. Tunis: al-Dār al-Tūnusiyya li-al-Nashr, 1919, 63-119.

Kandemir, Ahmet Mekin. "The Hand Extending Beyond the Cosmos: Discussions on the Khalāʾ [Void] Between the Baṣran and Baghdād Schools of Muʿtazila". *Nazariyat* 7/1 (2021), 1-36. dx.doi.org/10.12658/Nazariyat.7.1.M0103en

Kandemir, Ahmet Mekin. *Mu'tezilî Düşüncede Tabiat ve Nedensellik*, İstanbul: Endülüs Yayınları, 2019.

al-Khayyāṭ, Abū al-Ḥusayin ʿAbd al-Raḥmān b. ʿUthmān. *Kitāb al-Intiṣār wa al-radd ʿalā Ibn al-Rāwandī.* Critical edited by Henrik Samuel Nyberg. Egypt: Dār al-Kutub al-Miṣriyya, 1925.

Kılıç, Muhammet Fatih. "The Emergence of the Distinction between Complete and Incomplete Causes from Avicenna to al-Abharī", *Nazariyat Journal for the History of Islamic Philosophy and Sciences* 4/1 (2017), 63-85. dx.doi.org/10.12658/Nazariyat.4.1.M0036en

Māturīdī, Abū Manṣūr Muḥammad. *Taʾwīlâāt al-Qurʾān.* Critical edited by Bekir Topaloğlu. İstanbul: Mizan Yayınevi, 2005-2011.

Māturīdī, Abū Manṣūr Muḥammad. *Kitāb al-Tawhīd*. Critical edited by Bekir Topaloğlu & Muhammed Aruçi. Beirut: Dâru Sâdır, 2001.

Mehmet Bulgen. "Science and Philosophy in The Classical Period of Kalām: An Analysis centered upon The Daqīq and Laṭīf Matters of Kalām". Kader 19/3 (2021), 938-967. https://doi.org/10.18317/kaderdergi.1017086

al-Nashshār, ʿAlī Sāmī. *Nashʾatu al-fikr al-Islāmī*. Cairo: Dār al-Meʿārif, n.d.

al-Nīsābūrī, Abū Rashīd. *al-Masāʾil fi al-khilāf bayn al-Baṣriyyīn wa al-Baghdādiyyīn*. Critical edited by Maʿn Ziyāda wa Riḍwān al-Sayyid. Beirut: Maʿḥad al-Inmā al-ʿArabī, 1979.

al-Nīsābūrī, Abū Rashīd. *fi al-Tawḥīd diwān al-uṣūl*. Critical edited by Muḥammad ʿAbd al-Hadī Abū Riḍā. Egypt: Maṭbaʿa Dār al-Kutub, 1969.

Pines, Shlomo. *Madhab al-Dharra ʿinda al-Muslimīn*. trans. Muḥammad Abdülhādī Abū Zayda. Cairo: Maktaba al-Nahde al-Mışriyya, 1946.

Qāḍī ʿAbd al-Jabbār. *al-Majmūʿ fi al-Muḥīṭ bi al-taklīf*. Compiled by Ibn Mattawayḥ. Critical edited by ʿUmar al-Sayyid al-ʿAzmī. Cairo: Dār al-Miṣriyya. Beirut: n.d.

Qāḍī ʿAbd al-Jabbār. *al-Munya we al-amal*. Compiled by Aḥmed b. Yaḥyā al-Murtaẓa Critical edited by ʿUṣām al-dīn Muḥammād ʿAlī. s.l.: Dār al-Maʿrifa al-Cāmiʿiyya, n.d.

Qāḍī ʿAbd al-Jabbār. *al-Mughnī fi abwāb al-tawḥīd wa al-ʿadl IX: al-Tawlīd*. Critical edited by Tawfīk al-Tawīl wa Saʿīd Zayid. Cairo: s.n., n.d.

al-Rāzī, Fakhr al-Dīn. *Muḥaṣṣal afkār al-mutaqaddimīn wa al-mutaʾakhkhirīn min al-ʿulamāʾ wa al-ḥukamāʾ wa al-mutakallimīn.* Critical edited by Tāha Abd al-Rāʾūf Saʿd. Cairo: Maktaba Kulliyya al-Azhariyya, n.d.

al-Rāzī, Fakhr al-Dīn. *at-Tafsīru al-kabīr*, Beirut: Dār al-fikr, 1981.

al-Rāzī, Fakhr al-Dīn. *Sharh Uyūn al-hikma*, Tahran: Muassasah al-Sādık, 1415.

al-Shahristānī. *al-Milal wa al-niḥal*. Beirut: Muʾassasa al-Kutub al-Thaqāfiyya, 1994.

al-Shayh Al-Mufīd. *Awāʾil al-Maqālāt*. Critical edited by Ibrāhim al-Ānṣārī. Tahran: al-Muʾtamar al-ʿĀlamī li Alfiyya al-Shaykh al-Mufīd, 1413.

al-Siyālkūtī, ʿAbd al-Hakīm. "Ḥāşiyā ʿalā ḥāşiyā ʿAbdilghafūr Lārī". *al-Majmuʿa al-Nūriyya.* edited by Muḥammad Nūrī Nas. Midyat: Dâru Nur al-Sabāḥ, 2010.

Ess, Josef van. *Theology and Society in the Second and Third Centuries of the Hijra A History of Religious Thought in Early Islam*. Translated from German by Gwendolin Goldbloom. Leiden: Brill, 2017.

Ess, Josef van. "Ebû İshâk en-Nazzâm Örneği Üzerinden Kelâm-Bilim İlişkisi". trans by Mehmet Bulğen. *Marmara Üniversitesi İlâhiyat Fakültesi Dergisi*. 46 (2014), 274-278. https://doi.org/10.15370/muifd.22984

Ess, Josef van. *The Flowering of Muslim Theology*. trans. Jane Marie Todd. London: Harvard University Press, 2006.

Wolfson, Harry Austryn. *The Philosophy of the Kalam*. London: Harvard University Press, 1976.

Yavuz, Yusuf Şevki. "Mâtürîdî'nin Tabiat ve İlliyete Bakışı". *Büyük Türk Bilgini İmâm Mâtürîdî ve Mâtüîidîlik Milletlerarası Tartışmalı İlmi Toplantı.* İstanbul: M. Ü. İlahiyat Fakültesi Yayınları, 2012, 54-64.