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Commentary

The Importance of al-Ghazālī and Ibn Rushd in the History of Islamic Discourse on Religion and Science

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Introduction

The two classical Islamic texts on which this essay comments are important for our efforts to understand Muslim perspectives on and approaches to the issue of religion and science before the modern era. The texts are from English renderings of two Arabic works written by well-known Muslim thinkers who lived within the same century and during one of the most intellectually active periods in the history of Islam: the Persian al-Ghazālī (1058–1111 CE), and the Andalusian Ibn Rushd (1126–1198 CE), known to the Medieval Latin world as Algazel and Averroes, respectively.[1] The texts are excerpts from al-Ghazālī's *al-Munqidh min al-ḍalāl* (*Deliverance from Error*) and Ibn Rushd's *Tahāfut al-tahāfut* (*The Incoherence of the Incoherence*).[2]

Both Arabic titles are well known in the history of Islamic thought, no doubt partly due to the eminence of their respective authors. Both works are generally viewed by modern scholars of classical Islamic thought as important sources of information about how Muslim minds of the eleventh and the twelfth centuries engaged with issues of scientific knowledge of their day in relation to both religion and philosophy and how they debated with each other on these issues. The main aim of this essay is to discuss the key issues brought up by al-Ghazālī and Ibn Rushd in the two texts and to specifically identify their respective perspectives on and approaches to the issue of the relationship between religion and science.

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Account: s8989984

The Thought of al-Ghazālī and Ibn Rushd: The Historical–Intellectual Context

Situating the two texts in their historical context will help us better appreciate their significance for the relationship between religion and science during the times of al-Ghazālī and Ibn Rushd as well as during our present time. By the time of al-Ghazālī's birth, four centuries of Islamic history had passed. Scientific activities had flourished to the point of becoming a major feature of the new world civilization that Islam had founded.[3] By slightly over a century after the death of the Prophet Muḥammad (632 CE), science had taken root in the lands of Islam. In the eighth century, state-sponsored scientific activity had begun to take shape, and this was carried out and justified in the name of Islam itself.

Within a relatively short span of time Muslim scientists had made innovations in their respective fields of specialization and expertise. They had added new branches of natural science and mathematics through their creation as independent sciences or academic disciplines, including algebra, trigonometry, optics, mechanics, and civil engineering. The inclusion of these new disciplines in the growing body of scientific knowledge was formalized through the various classifications of knowledge and of the sciences that Muslim scholars produced at various times prior to and after al-Ghazālī.[4] One of these classifications of the sciences was composed by al-Ghazālī himself.[5] In fact, al-Ghazālī's text under discussion here contains his classification of the philosophical sciences into six branches in almost the same manner in which they had been classified by al-Fārābī and Ibn Sīnā, his two most well-known predecessors in philosophy, whom he severely criticized.[6]

Muslim scientists had also broadened the domain of applied science. The most extensive development and progress in the applied sciences occurred in agriculture; practical astronomy; the engineering sciences, which Muslim philosopher-scientists treated as parts of mathematics; and applied or practical medicine. There was extensive application of botany and zoology to agriculture, of mathematics to astronomy and engineering, and of medical science to pharmacology, just to mention the most important examples. By the time of al-Ghazālī, a distinctive scientific culture shaped and colored by Islamic epistemological and moral-ethical values had been well established.

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The newly created scientific and research institutions, notably the astronomical observatories and the teaching hospitals, were producing new knowledge as well as systematizing and synthesizing existing knowledge. Intellectual and scientific debates and exchanges of critiques between the different scientists and between the different philosophical-theological schools had become a normal feature of Muslim intellectual life. This aspect of Muslim intellectual life was particularly visible during the century immediately preceding al-Ghazālī's appearance (i.e., 950–1050 CE). This was the age of some of the greatest names in Islamic science and philosophy, including Ibn Sīnā (987 CE–1037 CE), al-Bīrūnī (d. 1051 CE), and the Ikhwān al-Ṣafā' ("Brothers of Purity").[7] The critical scientific debate between Ibn Sīnā and al-Bīrūnī, regarded by leading historians of Islamic science as the two greatest scientific minds in Islam, has been hailed by many as perhaps the most noteworthy of such debates in the history of Islam.

The intellectual dynamism of the period developed largely because scholars and thinkers outside the "scientific community" showed an interest in the scientific issues of the day, thinking of them as having nonscientific implications, particularly religious implications. Al-Ghazālī himself is an excellent example of this point. He was not technically a natural philosopher, as a scientist of his time was generally known. His own expertise was as a jurist and a theologian (*mutakallim*: scholar of the science of *kalām*). His interest in the scientific issues of the day was primarily motivated by philosophical-theological considerations as seen from the perspectives of *kalām*. He was deeply concerned about the philosophical and theological implications of scientific theories for the science of *kalām*, of which he was an eminent representative.

However, the contribution of men of science to the dynamism of the culture of intellectual debate should also be noted. Scientists such as Ibn Sīnā and the Ikhwān al-Ṣafā' were interested in philosophy and theology, but their perspectives were not the same as those of the school of *kalām*. Al-Fārābī (870 CE–950 CE) and Ibn Sīnā belonged to the Peripatetic school of the philosopher-scientists (*al-mashshā'iyyūn*) who were generally considered as the Muslim intellectual followers of Aristotle, although on many issues they differed from his views and interpretations. Al-Ghazālī was a critical thinker. He was critical not only of Muslim Peripatetic philosophy as expounded by al-Fārābī and Ibn Sīnā but also of the Pythagorean school as interpreted by the Ikhwān al-Ṣafā'.

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Moreover, he was even critical of some of the views held by many religious scholars in his own Ash'arite school of *kalām*. But he reserved his most severe criticism for the Peripatetics, especially al-Fārābī and Ibn Sīnā, whom he mentions by name in the part of *al-Munqidh* under consideration here.[8]

The prevailing intellectual climate was closely interconnected with the spiritual climate. There was not just an intra-Islamic epistemological pluralism but also a diversity of views regarding posthumous salvation. Al-Ghazālī wrote *al-Munqidh* in such an intellectual and religious climate. Composed a few years before his death, this intellectual autobiography provides an account of his personal and scholarly responses in the course of his life to the diverse intellectual and spiritual phenomena and challenges in the Islamic world of his time in general and in his native Persia in particular.[9] The central theme of *al-Munqidh* was his first personal crisis, which was epistemological in nature, and his second personal crisis, which was spiritual in nature.[10]

The epistemological crisis led him to study the epistemologies of all the major intellectual schools of his time, including Muslim Peripatetic epistemology. His spiritual crisis led to his full conversion to Sufism, embarking on the Sufi path to salvation and leading an ascetic and contemplative life. The limited concern of this essay allows us to deal only with an aspect of the epistemological crisis. This aspect pertains to his critique of the philosophical sciences, which cover much of what we understand today as science. This critique constitutes the core of our selected text from *al-Munqidh*. It is in this text that we find a brief reference to a philosophical-scientific issue that lies at the heart of the epistemological conflict between the school of *kalām* and the school of *falsafa* (Peripatetic philosophy). The issue in question is the idea of causality, which necessarily brings up the issue of the divine cause and the natural causes in the cause–effect chains observable in the world of nature.

Al-Ghazālī does not explicitly mention in this text the issue of causality, but he is obviously referring to it when, in his brief discussion of natural science, he explains that his objections to the Peripatetic philosopher-scientists on a number of issues were based on "the recognition that nature is in subjection to God most high, not acting of itself but serving as an instrument in the hands of its Creator."[11] This is just a passing remark, but in the same context al-Ghazālī points out that he has provided a detailed discussion of the issue in his critique of the Peripatetic philosophy of science titled "The Incoherence of the Philosophers" (*Tahāfut al-falāsifa*).

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Less than a century after al-Ghazālī's death, Ibn Rushd wrote "The Incoherence of the Incoherence" (*Tahāfut al-tahāfut*) with the intention of refuting many of the views presented by al-Ghazālī in *Tahāfut al-falāsifa*. The text from *Tahāfut al-tahāfut* under consideration here clearly explains the Peripatetic position on causality. Ibn Rushd, who is considered the most loyal Muslim follower of Aristotle, philosophically and scientifically speaking, clearly reflects the Aristotelian understanding of causality in his own treatment of this subject.

Al-Ghazālī and Ibn Rushd on Causality

Causality was very important to Peripatetic science. The Peripatetic philosopher-scientists tried to explain all natural phenomena in terms of the cause–effect principle, according to which the existence of a natural thing or the occurrence of a natural event or phenomenon is due to four causes: material, formal, efficient, and final. The efficient cause refers to the agent of the act that results in the effect. Regarding this principle, Ibn Rushd writes in our selected text from *Tahāfut al-tahāfut*: "It is self-evident that all events have four causes, agent, form, matter, and end, and that they are necessary for the existence of the effects—especially those causes which form a part of the effect, namely that which is called by the philosophers matter, by the theologians condition and substratum, and that which is called by the philosophers form, by the theologians psychological quality."[12]

To illustrate the four causes, let us take the simple example of the existence of a wooden table. The material cause of the table would be wood, the material of which the table is made. The formal cause would be the shape of the table. Its efficient cause would be the carpenter who crafts the wood into a thing with the shape of a table. The final cause would be the purpose of the table. This example is easily understood to explain the principle of causality since it is taken from the world of physical objects created by man. But when the object under consideration is not man-made but natural, and when all the causes are natural, then the identities of the four causes in question and their relations would be more difficult to comprehend. This, however, is the chief concern of Peripatetic science.

The main task of science, as seen by the Peripatetic scientists, is to identify the four causes and their properties. In their view no science would be possible

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if we were to dispense with the principle of causality in the sense just defined. For this reason, they strongly opposed any other perspective on the study of the natural world that did not find any necessity in their principle of causality. This explains the passion with which, in *Tahāfut al-tahāfut*, Ibn Rushd seeks to refute al-Ghazālī's arguments against causality in *Tahāfut al-falāsifa*.

Central to the Peripatetic idea of causality is the notion of the efficient cause. Thus in his reply to al-Ghazālī, Ibn Rushd concentrates on the defense of the efficient cause and the refutation of the former's denial of this type of cause. Al-Ghazālī's denial of causality rests on the following arguments: in his own words, (1) "the connection between what is usually believed to be a cause and what is believed to be an effect is not a necessary connection; each of the two things [i.e., cause and effect] has its own individuality and is not the other";[13] (2) "coexistence does not indicate causation";[14] (3) the necessary connection is the divine will and the divine power "for the connection in these things is based on a prior power of God to create them in a successive order, though not because this connection is necessary in itself and cannot be disjoined";[15] (4) in the natural world things exist and events occur because they proceed from "the First either directly or through the intermediation of the angels who are in charge of these events";[16] and (5) the angels are "the bestower of forms."[17]

What al-Ghazālī seeks to emphasize in these passages is that God alone is the agent or the efficient cause. Even when he concedes the intermediary role of the angels in the natural world, he would like others to acknowledge the fact that in reality it is God who is the efficient cause since he created the angels as his intermediary agents. In defense of this central argument in his denial of causality, al-Ghazālī emphasizes that what appears to man as a cause-and-effect relationship is nothing more than the habit of his mind to see the thing called cause and the thing called effect as indeed having such a relationship. Quite obviously, theology is the main consideration in al-Ghazālī's denial of causality. By implication, he wants science to be theocentric. Further support for this view can be found in the rest of *Tahāfut al-falāsifa*, where al-Ghazālī is concerned with the weakening and the corruption of the Muslim faith, which he attributes to the faulty Muslim view of science and of its relationship with religion, among other causes.

In the selected text from *al-Munqidh* al-Ghazālī addresses some of these faulty views particularly in his discussion of mathematics, natural science, and

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metaphysics. He appears to favor a scientific picture of the natural world based on another kind of causality in which the role of the secondary agents or efficient cause is marginal and the divine role is central, thus categorically rejecting the Peripatetic notion of efficient cause in favor of the idea of God as the dominant efficient cause. Critics of al-Ghazālī's position question the feasibility of such a science, but its proponents and sympathizers argue that the schools of *ḳalām* have produced numerous writings on atomistic cosmology and atomistic physics that, interestingly enough, share many features with contemporary quantum physics.

In his response to al-Ghazālī's denial of causality, Ibn Rushd stresses the following points: (1) "Logic implies the existence of causes and effects, and knowledge of these effects can only be rendered perfect through knowledge of their causes. Denial of cause implies the denial of knowledge, and denial of knowledge implies that nothing in this world can really be known, and that what is supposed to be known is nothing but opinion, that neither proof nor definition exist, and that the essential attributes which compose definitions are void";[18] (2) "To deny the existence of efficient causes which are observed in sensible things is sophistry, and he who defends this doctrine either denies with his tongue what is present in his mind or is carried away by a sophistical doubt which occurs to him concerning this question. For he who denies this can no longer acknowledge that every act must have an agent";[19] (3) "It is self-evident that things have essences and attributes which determine the special functions of each thing and through which the essences and names of things are differentiated. If a thing had not its specific nature, it would not have a special name nor a definition, and all things would be one—indeed, not even one";[20] and (4) the philosophers all agree that "the First Agent is immaterial and that its act is the condition of the existence and acts of existents, and that the act of their agent reaches these existents through the intermediation of an effect of this agent, which is different from these existents and which, according to some of them, is exclusively the heavenly sphere, whereas others assume besides this sphere another immaterial existent which they call the bestower of forms."[21]

Conclusion

We may infer from the salient arguments presented by al-Ghazālī and Ibn Rushd that their main dispute concerning causality is about the nature and

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reality of the central agent or efficient cause that is to play the dominant role in their respective sciences, whether it should be God as the First Agent and the immaterial and invisible intermediary agents or the natural secondary agents. But they also share significant views. They agree that God is the First Agent and that there are immaterial intermediary agents that they identify with the "bestower of forms," although they differ on the precise identities of these intermediary agents. For both of them, science is ultimately based upon the divine reality.

Through his detailed studies of *ḳalām* and *falsafa* al-Ghazālī was persuaded to formulate a new epistemology for each of these sciences and to redraw the boundaries of science in conformity with the new epistemology. The new epistemology that he in fact did formulate, but which is beyond the scope of this essay, sought to reaffirm the subordination of reason to divine revelation, a doctrine that in his view had been undermined by the Muslim Peripatetic philosopher-scientists.

For Further Reflection

1. What are the main features of the theological orthodoxy that al-Ghazālī seeks to defend?
2. What are the main points in al-Ghazālī's critique of the philosophers?
3. What can we infer about al-Ghazālī's philosophy of science from the text?
4. Does al-Ghazālī provide an accurate account of both Greek philosophy and the Muslim philosophies of science current in his time?
5. How critical is Aristotelian causality to science?
6. What is the significance for contemporary Muslim thought of the differences between al-Ghazālī and Ibn Rushd illustrated by these texts?

Notes

1. For a detailed account of the life, works, and significance of al-Ghazālī, see Osman Bakar, *Classification of Knowledge in Islam* (Cambridge: Islamic Texts Society, 1998), ch. 7. For the life, works, and significance of Ibn Rushd, see Majid Fakhry, *Averroes (Ibn Rushd): His Life, Works and Influence* (Oxford: Oneworld Publications, 2001).

2. See W. M. Watt, trans., *The Faith and Practice of al-Ghazālī* (London: Allen & Unwin, 1953). This translation has seen numerous reprints since its first publication. The first English

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translation of *al-Munqidh min al-ḍalāl* was made available by Claud Field. See Claud Field, trans., *The Confessions of al-Ghazali* (London: John Murray, 1909). Another translation, which is richly annotated, is by Richard Joseph McCarthy. See R. J. McCarthy, trans., *Freedom and Fulfillment: An Annotated Translation of al-Munqidh min al-Dalal and Other Relevant Works of al-Ghazali* (Boston: Twayne Publishers, 1980). Citations here refer to W. Montgomery Watt, *Al-Ghazālī: Deliverance from Error and the Beginning of Guidance* (Kuala Lumpur: Islamic Book Trust, 2005), 16–27. For the Ibn Rushd text, see Simon van den Bergh, trans., *Averroes' Tahafut al-Tahafut (The Incoherence of the Incoherence)* (London: Luzac and Co., for the Trustees of the E. J. W. Gibb Memorial, 1954).

3. For a good introductory account of the historical development and important features of scientific activities in the first four centuries of Islam, especially in their relations to the spiritual and societal teachings of Islam, see Seyyed Hossein Nasr, *Islamic Science: An Illustrated Study* (London: World of Islam Festival Publishing Co., Thorsons Publisher Ltd., 1976).

4. For a comprehensive study of the Muslim classifications of the sciences in classical Islam, see Bakar, *Classification of Knowledge in Islam*.

5. For a detailed study of al-Ghazālī's classification of knowledge (*'ilm*) and of the sciences (*'ulūm*), see Bakar, *Classification of Knowledge*, ch. 8 and 9.

6. Watt, *Al-Ghazālī*, 20–27.

7. For a detailed comparative study of these philosophers and scientists, see Seyyed Hossein Nasr, *An Introduction to Islamic Cosmological Doctrines* (Cambridge: Harvard University Press, 1964).

8. Watt, *Al-Ghazālī*, 20.

9. Al-Ghazālī wrote *al-Munqidh* in Naishapur between 1106 CE and 1110 CE after his return to public teaching at the Nizamiyyah Madrasa there following a decade-long period of spiritual retreat.

10. For a detailed study of the nature and significance of these two personal crises of al-Ghazālī, see Osman Bakar, *Tawhid and Science: Islamic Perspectives on Religion and Science* (Shah Alam: ARAH Publications, 2008), 2nd ed., ch. 3.

11. Watt, *Al-Ghazālī*, 25.

12. Van den Bergh, *Averroes' Tahafut al-Tahafut*, 319.

13. Ibid., 316.

14. Ibid., 317.

15. Ibid., 316.

16. Ibid., 316.

17. Ibid., 320.

18. Ibid., 318.

19. Ibid., 317.

20. Ibid., 317.

21. Ibid., 320.

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