The Qurʾān and Science

with Majid Daneshgar, "The Qurʾān and Science, Part I: The Premodern Era"; Majid Daneshgar, "The Qurʾān and Science, Part II: Scientific Interpretations from North Africa to China, Bengal, and the Malay-Indonesian World"; and Majid Daneshgar "The Qurʾān and Science, Part III: Makers of the Scientific Miraculousness."

THE QURʾĀN AND SCIENCE, PART I: THE PREMODERN ERA

by Majid Daneshgar

Abstract. As the first installment in a three-part series on the Qurʾān and science, this article begins with the author's personal and scholarly experiences to demonstrate the importance of the twin trends of Qurʾānic scientific interpretation and Qurʾānic scientific miraculousness, including how both serve as Muslims theological tools. It then touches upon the close relationship between theology and scientific knowledge in the history of Islam. The main focus concerns how science is situated and defined in Islamic literature, with particular references to traditional Muslim commentaries and treatises. It also concerns the way Muslim exegetical figures and traditionalists are encouraged or discouraged from taking science into account based on the Qurʾān and prophetic traditions.

Keywords: al-Ghazālī; al-Rāzī; miracle; Muḥammad; Qurʾān; science; scientific knowledge

Introduction

There is currently more interest in debates regarding the Qurʾān and science than at any other time in the past. This is due to both the significant growth of Muslim populations around the world and the many striking scientific discoveries that have been made in various disciplines over the past several decades. Such debates are now commonly encountered in educational contexts as well as in popular forums. Indeed, the more scientific breakthroughs, the more questions there are about the relationship between the Qurʾān and science.

This set of articles discusses two aspects of this general relationship between the Qurʾān and science: scientific interpretation (*tafsīr ʿilmī*) and

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scientific miraculousness (*iʿjāz ʿilmī*). The first approach applies scientific (*ʿilmī*) data to explain Qurʾānic verses, while the second claims that the Qurʾān contains scientific findings and has particular scientific features, such as harmonious numerical analogies and formulae (viz., *al-iʿjāz al-ʿadady*), that confirm the divine origin of the text. The science (*ʿilm*) referred to in these two categories is not limited to a particular period of time. Just as scientific findings push forward boundaries, so too do the purported scientific interpretation and scientific miraculousness of the Qurʾān move forward. Much of the resultant phenomenon, involving both advocates and opponents, takes place in the world of social media, publishers, and educational and academic spheres.

Over the course of history, a large number of physicians, theologians, and philosophers have discussed the way science should (or should not) be placed in Muslim exegetical discourses. Nonetheless, academic readings of scientific interpretation and scientific miraculousness of the Qurʾān began in the early twentieth century CE. One of the first attempts was that of Amīn al-Khūlī (d. 1966), an Egyptian professor and diplomat known for his literal interpretation of the Qurʾān. Al-Khūlī did not agree with the scientific and naturalist interpretation of the Qurʾān, which had become more principled due to pervious Arab thinkers like Ṭanṭāwī Jawharī, al-Rāfiʿī, and Ḥanafī Aḥmad (see Part II). Al-Khūlī did not support their interpretive agenda, predicting that it would end up demonstrating the scientific miraculousness of the Qurʾān as a radical reading of the holy scripture. Al-Khūlī believes the Qurʾān should be read and interpreted literally based on the "richness of its Arabic language" (al-Khūlī 1964, 78–79) revealed to the Arabs of the seventh century CE. According to him, it was the Arabic heritage that should have been revived, not the texts by exegetical figures from the classical period of Islam, such as Abū Ḥāmid al-Ghazālī and Fakhr al-Dīn al-Rāzī, among others (al-Khūlī 1964, 78–79). To critique previous exegetical trends (including the scientific one), he applies the ideas of Abū Isḥāq al-Shāṭibī, who stated that "the Qurʾān is not understood but as it was read by the illiterate Arabs to whom the Qurʾān was addressed" (quoted in al-Khūlī 1964). Some influential reformers and exegetes, such as Maḥmūd Shaltūt (d. 1963), show less interest in the relationship between the Qurʾān and science, challenging former literature on scientific interpretation (see Zebiri 1988). Āʾisha ʿAbd al-Raḥmān (d. 1998), also known as Bint al-Shāṭiʾ and the wife of al-Khūlī, also played a key role in the discourse on the Qurʾān and science. One of the main points in her exegetical works is that the Qurʾān was revealed to "an illiterate Prophet and illiterate community" who did not need to have scientific knowledge about the contents of the Qurʾān (for more, see Amīn 1992, 89).

There have also been debates in Shīʿī contexts. In the 1960s, Jaʿfar Sobḥānī (b. 1929) prolifically responded to Iranian readings of the

Qurʾān. He believes that the Qurʾān is not meant to "instruct human beings with science and technology" and that none of the prophets "were chosen to teach physics, chemistry, or other mathematical, astronomical and cosmological issues" (Sobḥānī 1983, 7–8). Nonetheless, he agrees that "the Qurʾān sheds light on secrets that nobody was aware of before recent scientific revolutions […] there is no other way but to say that the Creator of the universe has granted all such information to the Prophet Muḥammad" (Sobḥānī 1983, 7–8). According to Sobḥānī, the Qurʾān should be read along with the sciences, as other non-Islamic and Islamic disciplines are. This idea is echoed by Mustansir Mir (2004), who—although he excludes Shīʿī literature—states that scientific interpretation is as important and applicable as linguistic and legal interpretations.

Academic discourse on the Qurʾān and science has grown in popularity in the new millennium, with many scholars and scientists from different corners of the world now involved in it. Some have emerged as vocal critics, rejecting the scientific miraculousness of the Qurʾān, which they differentiate from the scientific interpretation of the Qurʾān. Others are strong advocates for the scientific miraculousness of the Qurʾān. These scholars and scientists have been instrumental in inviting a large number of Muslim scientists to interpret Muslim theology—despite their limited knowledge of Islamic intellectual tradition—and in encouraging Muslim theologians—without any empirical background—to apply scientific data in their studies. Some are looking for new theological answers to resolve the conflict between science and Islam, while others have been trying to detect the origin of various modern [empirical] sciences (e.g., biology, Darwinism, psychology, psychotherapy) in Islamic tradition and Muslim theological treatises. Both groups share a common concern: the Qurʾān *must* be known as a divine source. In this vein, the Qurʾān and science discourse acts as one of the most efficient and effective tools used by apologists to prove and promote Islam throughout the world.

As a regular reader and active contributor in the field over the last ten years, I have noticed some fundamental problems: (a) the field has been extremely male-centric, with women as marginal contributors, although it is now mainly shepherded by apologetic male scientists, philosophers, and theologians; (b) the field is strictly controlled by experienced figures who act like gatekeepers, limiting the voice of young researchers; and (c) the Qurʾān and science is often seen through the lens of Sunnī Middle Eastern materials, and scholars are silent about public and academic discussions in Africa and Southeast Asia. In this three-part series, I aim to address most of these gaps, especially (b) and (c).

I will map (and sometimes remap) the formation and development of the scientific interpretation and scientific miraculousness of the Qurʾān in different corners of the world. Although my research initially focused on the Middle East, this study also demonstrates how Muslim and

non-Muslim residents of other regions have engaged with the relationship between the Qurʾān and science. Along the way, the scientific interpretation and the scientific miraculousness of the Qurʾān are addressed from both an internal perspective—as aids for Muslim communities to interpret and describe the Qurʾān—and an external perspective—as a means of claiming victory over opponents, namely non-Muslims (e.g., colonial officers), which is addressed in the second article in this series.

It is impossible to address every single work written about the Qurʾān and science, but this series of articles aims to include both those that are popular and those that are less well-known, as both have made significant contributions to the ongoing debate.

Personal Journey

After visiting Shīʿī, Sunnī, and Sufi seminaries, universities, theological circles, and interdisciplinary research centers in Iran, Turkey, Malaysia, and Indonesia, I can attest that the scientific interpretation and scientific miraculousness of the Qurʾān are standard topics in such institutions. These two trends are generally seen as the main representatives of the discourse on "the Qurʾān and science," a phrase I use to subsume both scientific interpretation and scientific miraculousness. Other facets of the discourse are manifested in interdisciplinary fields such as Islamic banking, Islamic insurance, Islamic economics, Islamic psychology, Islamic education, the Islamization of knowledge, and Islam and philosophy—or are involved in theoretical discussions on Islam and science, religion and science, and Muslim philosophy and science. However, Muslim engagement with the Qurʾān and science, which ultimately led to the dual trends of scientific interpretation and scientific miraculousness, began during the earliest period of Islam and has thus been present for centuries. As will be seen, the topic of the Qurʾān and science has been used in the context of theological, sociopolitical, and missiological discussions by both scientists and preachers, Muslim and non-Muslim alike.

Working in various Western universities in New Zealand, Germany, and the United Kingdom, as well as visiting different North American academic contexts, I have noticed how "the Qurʾān and science" is an important element in discussions regarding the divine origin and credibility of Islam. I have observed second- and third-generation Muslim immigrants in New Zealand seeking to preserve their Islamic identity by attempting to prove that the Qurʾān is the most complete scripture and the "final" revelation to humankind given to Muḥammad, the Muslims' final prophet. One way of doing this is by organizing local and national exhibitions near Islamic centers where food is served during Muslim holidays.[1] Halls are typically adorned with hundreds of posters showing Qurʾānic references to modern science along with leading scholarly figures and preachers in

the field of the Qurʾān and science. Such posters seek to prove the validity of Islam, with the accompanying food confirming the crucial role of hospitality in Muslim culture; both aspects are thus used to prove Muslim identity to non-Muslims. I asked a student of mine who was one of the organizers of such an event in New Zealand to lead short seminars during my Introduction to Islam course (which incidentally demonstrated that the topic of the Qurʾān and science is relevant in universities). During the class, the student discussed the authenticity of the Qurʾān through the lens of empirical science; for him, the main source was *La Bible, le Coran et la science* (*The Bible, the Qurʾān and Science*), a text by the French physician Maurice Bucaille (d. 1998) (discussed further in the third article in this series). In this volume, Bucaille asserts that the Qurʾān not only contains scientific facts but is also scientifically and empirically superior to the Bible. The student's presentation resulted in a confrontation between Muslims and non-Muslims in the class, with particular opposition shown by another student originally from Colorado Christian University, who was furious at the Muslim student's attempt to elevate the Qurʾān and minimize the Bible.

As Muslim and Christian students defended their religious traditions in class, I recalled having seen similar conflicts on a wider scale between Muslim and non-Muslim scholars of Islamic studies. During a conference lunch in Ankara in 2013, Christians and Muslims were speaking about different interreligious theories. While we were enjoying local Turkish cuisine, the debate, which was supposed to be convivial, ended up turning sour. Bucaille's book was mentioned around the table, with attention to his elevation of Islam, after which American and French scholars left, vocally criticizing Bucaille's thesis. Interestingly, most advocates of Bucaille's thesis were also followers of Edward W. Said (1978) and his (mis)reading of orientalism. In their opinion, Said's criticism of Christian colonialism and European intellectual traditions should be read along with Bucaille's criticism of Christian biblical scriptures. For them, Bucaille's work is not a simple project about the relationship between religion and science but granted a fresh voice to anti-Westerners and anti-Orientalists. The work of these scholars soon became a vehicle for Muslim decolonizers who aimed to exclude Judeo-Christian believers from two disciplines of Islamic studies and Islam and science (see Daneshgar 2020).

Such confrontations are not limited to Muslim–Christian debates. While doing research on the relationship of the Qurʾān and science through the lens of an Indian scholar, I became aware that members of the Hindu religion and other religious communities across India also participate in debates on religion and science. One figure celebrated at such gatherings was the Indian physician and imam Dr. Zakir Naik, whose thoughts became the subject of my master's thesis. As I listened to his lectures and watched his videos, I realized the potential for the topic of the Qurʾān and

science to be used as an instrument by Muslim preachers and imams to silence "the other." It does not matter who these "others" are or whether they are asking challenging questions about the origin and message of the Qurʾān and Muḥammad's mission to pass on the word of God to his people. Naik (author of *The Qurʾān and Science: Compatible or Incompatible?*) uses the Qurʾān and science as a tool to respond to non-Muslims as well as skeptical Muslims, an approach previously practiced by several Muslim theologians over the centuries.

When doing my Ph.D. research, I focused on leading figures of the scientific interpretation and scientific miraculousness of the Qurʾān: Shaykh Ṭanṭāwī Jawharī (d. 1940), an Egyptian leading scientific interpreter of the Qurʾān, and Bucaille, a European physician who employed scientific analysis in his study of the Qurʾān. The outcome of this research demonstrated that, although the objectives of the two figures differ, their approaches to science in the Qurʾān both depend on interaction or confrontation with non-Muslims. Both ideas about the relationship between the Qurʾān and science have developed into theological doctrines, gradually giving increasing power and influence to their advocates, as well as the social and political agendas they represent. As will be discussed in the following section, one of the primary goals of this theological movement has been to convince opponents, using science, that Islam, the Qurʾān, and Muḥammad are reliable sources of truth. The movement has also been used to unite Muslims around their scripture and against the holy texts of other religions.

Theology and Science

The theological power generated by the debate over the Qurʾān and science has often been used to immunize Islam. In other words, it has been used by theologians as a defensive tool to build a wall against those who disagree with Islam and Muḥammad's teachings. For a long time, non-Muslims have attempted to marginalize Muslims by deliberately misreading their tradition. According to medieval Christian apologists and polemicists, including Ramon Martí, Roger Bacon, Ramon Llull, and Riccoldo da Montecroce, "learned Saracens did not in fact believe in the doctrines of the Qurʾān, that only the fear of physical punishment made them publicly proclaim their adherence to Islam" (Tolan 2002, 184). Conversely, Muslim theologians have denied the Christian Trinity and challenged the divinity of Jesus. Each group has typically thought that its own religion is more accurate than that of the other. One of the main instruments used in theological arguments has been the scientific knowledge of the time; scientific knowledge has fueled theological beliefs, although this interaction temporarily declined during the Industrial Revolution:

> Science and Theology are not two historic champions who have gone down to Ephes-dammim with polemical intent, like the shepherd boy of Israel and the Philistine. The one, to speak roughly, is simply a group of facts, the other, a group of beliefs, that lie in different planes and atmospheres of thought; yet are held together by the complex needs and functions of our nature, and contribute to the common stock of our intellectual furniture […] The alleged conflict between theology and science is simply the dispute of men who exploit one method of interpretation to the discredit and exclusion of the other. (Battershall 1897, 89)

The American priest Walton W. Battershall (d. 1920) believes that "science or criticism or any form of demonstrated fact can do nothing to theology […] except to vindicate it, clarify it, and enrich it. A fact wherever found is a divine thing" (Battershall 1898, 251–52). Scientific knowledge was an aspect of theological arguments long before Battershall; each field enriched and served the other. Christians and Muslims viewed their prophets as thinkers. According to some Christians, however, "on questions of history, of physical or mental science, Jesus has nothing to say" (Burton 1897, 245–46). By contrast, within a few centuries of the emergence of Islam, Muslims had established that the illiterate Muḥammad and his miracle of the Qurʾān were both inerrant and infallible. For Muslims, the Qurʾān and Muḥammad have been sources of eternal knowledge and wisdom. As such, two different theological arguments flourished after the formative period of Islam: the infallibility (*ʿiṣma*) of Muḥammad and the miraculousness (*iʿjāz*) of the Qurʾān. Muslim theologians typically agree that Muḥammad was free of error, as is the Qurʾān, and the Qurʾān is a miracle, inimitable in content and form.

To demonstrate the authenticity of the Qurʾān and Muḥammad's mission, Muslim theologians have cited various sources, including both the Qurʾān and the Bible. The Qurʾān confirms its uniqueness through the "challenge verses" (e.g., Qurʾān 2:23; 11:13; 17:88). Classical Muslim courts hired Christians to describe biblical information about the emergence of Islam, the mission of Muḥammad, and his miracles (see Thomas 2011, 207).

To elevate the status of the Prophet, Muslims then devised a new literary genre, known as Prophetic Medicine (*al-Ṭibb al-Nabawī*), as a response to Greek and other non-Islamic traditions on medicine (see Ibn Qayyim al-Jawziyya 1983, I:150–52; Ragab 2012); when a large area of Islamic theology and scientific knowledge was influenced by Galen, Hippocrates, Euclid, and other Greek sources, there was concern about the role of the so-called original Islamic sources and sciences.[2] One of the earliest volumes on Prophetic Medicine was assembled by Abū Nuʿaym al-Iṣfahānī (d. ca. 1038) and included "838 medical hadith" (Perho 2023). But *al-Ṭibb al-Nabawī* began to be read by people from all walks of Muslim society when Muḥammad al-Dhahabī (d. 1348) and, even more so,

Ibn Qayyim al-Jawziyya (d. 1350) developed more comprehensive projects in the Prophetic Medicine genre. Some important aims of Ibn Qayyim al-Jawziyya were dealing with the rejection of occult science and the removal of Islam from non-Arab materials (Livingston 1992, 598–600). Ibn Qayyim al-Jawziyya presents an Islamized version of medicine that introduces the Qurʾān as the book of everything and Muḥammad as the inerrant and knowledgeable servant of God. His discussions begin with the Prophet's ideas about the typology of medical treatments, noting that physiology (*ṭibb al-abdān*) is seen alongside the perfect law of Muḥammad (*sharīʿat*) (Ibn Qayyim al-Jawziyya 1983, I:20). This idea prompted minority Muslim groups like Shīʿīs and Sufis to ascribe miraculous knowledge and power to their saints and leaders. For example, refer to *Ṭibb al-Riḍā* (طبّ الرضا), a collection concerning the medical prescriptions of the eighth Imām of Shīʿa, ʿAlī ibn Mūsā al-Riḍā (d. ca. 818) (Figure 1).[3]

Science in Classical Qurʾānic Literature

Integration of Interpretive and Miraculous Approaches

Muslim interest in using scientific knowledge to interpret the Qurʾān dates back to the formative period of Islam. Although the Islamic concept of science was different at that time, this approach to Qurʾānic exegesis is still practiced. However, the objectives behind the scholarly corpus have changed significantly over time. As is the case with modern interpreters, earlier Qurʾānic commentators were selective in terms of themes and methods; some adopted a literal approach to the Qurʾān, while others took a theological, naturalistic, or cosmological approach.

A key verse concerning the creation of humans is Qurʾān 96:2: "خَلَقَ ٱلۡإِنسَٰنَ مِنۡ عَلَقٍ [He] Created man, out of a (mere) clot of congealed blood."[4] All commentators on this verse show a level of familiarity with the physiology or medicine of their own time. Muqātil ibn Sulaymān (fl. eighth century CE), one of the first Qurʾānic commentators, glosses the underlined term 'عَلَقٍ' (*ʿalaq*) as the advanced form of "sperm made of fluid and blood" (Muqātil [1423] 2003, iv:762). Muqātil's description of the *ʿalaq*, the biological origin of the human embryo, being made of blood and water, along with the idea that *ʿalaq* shifts its shape and essence over time, suggests that some basic medical knowledge was accessible to him.[5] A wide range of Muslim exegetes—Sunnī (e.g., al-Ṭabarī 1991, xxx:161; al-Samarqandī 1995, iii:598), Shīʿī (e.g., al-Ṭūsī n.d., x:379; al-Ṭabrisī [1372] 1993, x:781) and Sufi (e.g., Kāshifī n.d., 1367)—discuss the formation of *ʿalaq* out of blood and describe its particular features. Yaʿqūb Charkhī (d. ca. 1447 CE), one of the influential Sufi commentators from the Balkh-Bukhara region of the Persianate world, treats this verse from a creationary-evolutionary perspective:

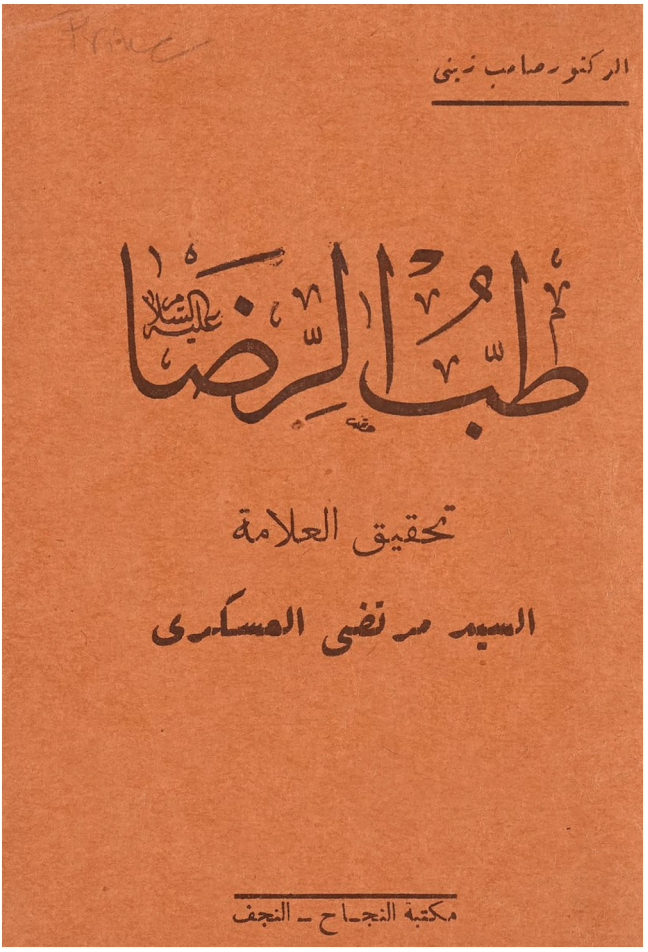

Figure 1. Book cover. *Ṭibb al-Riḍā*, published in Iraq.

آفرید همه آدمیان را از پاره خون بسته، یعنی آدم را از خاک آفرید و فرزندان او را از خون

> [He] created all human out of a blood clot. It means that "Adam" was created out of soil/earth, and his descendants were out of blood. (Charkhī 1999, 213)

Whether they received their knowledge through local traditions, previous exegetical literature, or scientific treatises, the elaboration of these commentators on Qurʾān 96:2 is a clear sign of early interest in scientific interpretation of the Qurʾān.

Some influential commentators have used the verse to address God's absolute authority and wisdom (e.g., al-Zamakhsharī 1986, iv:775; al-

Bayḍāwī 1997, 335). Al-Ṭabrisī, for example, in discussing Qurʾān 96:2, takes a theological approach. He compares the biological development of blood to sperm to human with the way a human may leave behind ignorance and become a prophet (al-Ṭabrisī [1372] 1993, x:781–82). Here, Muslim commentators have employed scientific knowledge as a tool to help comprehend the Qurʾān and as a vehicle to convey their own theological perspectives.

Other verses about the creation of humans—for example, Qurʾān 23:12–14 ("Man We did create from a quintessence (of clay); Then We placed him as (a drop of) sperm in a place of rest, firmly fixed; then We developed the drop into a (mere) clot of congealed blood […]")—have been interpreted in the same manner. Al-Qummī, an early Shīʿī interpreter from the tenth century CE, dedicates several paragraphs in his commentary to Qurʾān 23:12–14, integrating theological accounts (from the Muʿtazīlīs) with traditional Shīʿī legal sources (based on *fiqh* (Islamic law) and *ḥadīth* (prophetic traditions)) dealing with the formation of the fetus in the mother's womb. In his legal-theological reading of these verses, al-Qummī's exegesis, using prophetic and *imāmī* (Shīʿī) traditional sciences, considered the duration of biological development from sperm to clot of congealed blood to be forty days (al-Qummī [1363] 1984, ii:89–90).

Although Muslim commentators explained Qurʾānic verses using science to confirm the theology of Islam, Muslims were also keen to proclaim the miraculous nature of the Qurʾān as a book containing everything from past to present, meaning all that humans had (and did not have) knowledge about. This line of thought is evident in the work of Abū Sulaymān Ḥāmid ibn Muḥammad ibn Ibrāhīm ibn al-Khaṭṭābī (d. ca. 998) from Bust in Afghanistan, "a leading scholar in the fields of the Islamic prophetic tradition (*ḥadīth*) and Shāfiʿī jurisprudence" (Günther 2008, 4). Al-Khaṭṭābī specifically argues that the Qurʾān is discoverable through the statements of the Prophet Muḥammad. He wrote *Bayān Iʿjāz al-Qurʾān* (*Clarification of the Miraculous Features of the Qurʾān*), a treatise in which he outlines different aspects of Qurʾānic miraculousness (Figure 2). One category concerns accounts of the future. He refers to verses such as Qurʾān 30:2–3: "The Roman Empire has been defeated in a land close by; but they, [even] after [this] defeat of theirs, will soon be victorious."[6] According to al-Khaṭṭābī, the Qurʾān is seen by some scholars as a mine of historical information about the past and future (al-Khaṭṭābī n.d., fol. 4), providing a sketch of human society and history. The way al-Khaṭṭābī describes the miraculous nature of the Qurʾān is used by modern-day advocates of Qurʾānic scientific miraculousness who consider the Qurʾān's historical miraculousness an aspect of its scientific miraculousness.[7]

The back and forth of theological discussions around the interpretation and miraculousness of the Qurʾān continued for centuries. Historical debates around the miraculous content of the Qurʾān and its comprehen-

Figure 2. Fl.2, Or. 655. Bayān Iʿjāz al-Qurʾān by Abū Sulaymān Ḥāmid ibn Muḥammad ibn Ibrāhīm ibn al-Khaṭṭābī. Courtesy of the Leiden University Library.

siveness (presented by al-Khaṭṭābī) were then favored by more exegetical figures, leading some to state that the Qurʾān was potentially the source of everything, including things not obvious to ordinary people. Abū Ḥāmid al-Ghazālī[8] (d. 1111) treats this topic systematically, acknowledging and applying natural science in his Qurʾānic commentary in order to understand the laws of the universe.[9] Al-Ghazālī "mastered most if not all the theoretical sciences" of his time (Malik 2021, 9). He was convinced that the Qurʾān contains the knowledge of all science, from past to future (see Hartmann 1916). He has thus been an inspirational source for modern scholars like Jawharī who have discussed the topic of the Qurʾān and science. For al-Ghazālī, nature is a reflection of God's omnipotence; scientific principles—"even those which are yet to be discovered and those encompassed by present knowledge" (see Whittingham 2007, 70)—emanate from religion. Otherwise, they would not result in spiritual truth.

For al-Ghazālī, knowledge is achieved through an "external process" (al-Ghazālī 1991, 14) but is incomplete without taking the Qurʾān into account as a mine of eternal knowledge. Although "knowledge is excellent in itself" (al-Ghazālī 1938, 192; Asari 1999), "no one will attain [its] happiness without obeying the orders of God or without doing good deeds" (Asari 1999, 59). According to al-Ghazālī, the most successful people are those who "unify reasoning and the religious textual tradition by discern-

ing that there is no conflict between the two" (Jaffer 2015, 75). He thus promotes a tie between the Qurʾān and nature—in a general sense not a detailed one—and his Qurʾānic interpretation often draws on a combination of Islamic religious disciplines and the testimony of natural sciences taken from various sources. Regarding Qurʾān 82:6–8 ("O man! What has seduced thee from thy Lord Most Beneficent? Him Who created thee. Fashioned thee in due proportion, and gave thee a just bias; In whatever Form He wills, does He put thee together"), al-Ghazālī comments: "Everything can only be known by Him who knows the anatomy of man's limbs and internal organs, their number, their kinds, their underlying wisdom and their uses. God points to these in many places in the Qurʾān" (al-Ghazālī 1933, 27; also see Whittingham 2007, 70). According to al-Ghazālī, only God is able to control the universe, only God is equipped with intimate knowledge about the internal organs of humans and other beings. His book, the Qurʾān, gives readers information about past and future science.

Similar exegetical accounts are found in commentaries by two medieval Muslim thinkers: Fakhr al-Dīn al-Rāzī (d. ca. 1210) and Niẓām al-Dīn al-Nīsābūrī (d. ca. 1328). Following al-Ghazālī, al-Rāzī "integrated philosophical [natural] concepts and principles into the religious sciences […] and he applied them systematically to the Qurʾān as he commented on it verse-by-verse, line-by-line, and word-by-word" (Jaffer 2015, 74). Al-Nīsābūrī adopts the same approach, holding that certain astronomical and astrological discoveries are helpful in comprehending God's presence and power (see Morrison 2005). Elaborating on al-Ghazālī's argument about God's authority and power over the universe, al-Rāzī and al-Nīsābūrī explain nature as an aspect of scientific knowledge (see Daneshgar 2018).

Using natural references to prove God's power is also seen in non-Arabic Qurʾānic commentaries. The Persian *Tafsīr-e Baṣāʾir-e Yamīnī* by Muʿīn al-Dīn al-Nisābūrī (d. c. 1182), widely circulated across the Muslim world, interprets Qurʾān 10:6 ("Verily, in the alternation of the night and the day, and in all that Allah hath created, in the heavens and the earth, are signs for those who fear Him") in accordance with former Arabic commentaries: "And whatever God has created in heavens and earth are novel, innovative and wondrous signs demonstrating the 'Unity' of the Creator and His authority and wisdom" (al-Nīsābūrī n.d., fol. 51).

Even lesser-known commentators have used the same approach to define nature, creation, and God's universal authority. In interpreting Qurʾān 92:3 ("By (the mystery of) the creation of male and female"), Muḥammad Muʾmin Mashhadī, a Shīʿī scholar who dedicated his work to the Safavid Shāh ʿAbbās (d. 1629), says:

وسوگند بآن قادر عظیم قدرتی، آن چنان قادری که قدرت دارد برخلق کردن ذکر وانثی
از آب واحد.

> And by the one Omnipotent Almighty, the All-powerful who has power to create male and female from one fluid. (Muʾmin Mashhadī 1982, 135)

For Muʾmin Mashhadī, the creation of a human is the result of a biological process that sheds light on the theistic and divine idea that such creation is conducted under God's omnipotence. This approach is also seen in Southeast Asia.[10] An example is found in *Tafsīr Tarjumān al-Mustafīd* by ʿAbd al-Raʾūf al-Sīngkilī, one of the earliest known Malay commentators, from the seventeenth century CE (see Riddell 1984). Under Qurʾān 92:3, ʿAbd al-Raʾūf indicates that nature also constitutes a proof of God's omnipotence: "*Dan demi Tuhan yang berkuasa menjadikan Adam dan Hawa'* (And by the Lord who has the power to create male and female)" (al-Sīngkilī 1961, iii:318).

The Qurʾān, Muḥammad, and Nature

There were also Islamic indications that prompted Muslims to become advocates of the sciences: "Although God has taught Adam the knowledge of the names, David the knowledge of chain-mail making, Jesus the science of medicine, Khiḍr the science of recognition, God taught Muḥammad the secrets of divinity" (i.e., Qurʾān 4:113: "For Allah hath sent down to thee the Book and wisdom and taught thee what thou knewest not (before)") (al-Maybudī 2015, 489).

Natural and Cosmological Indications

It is a widely known idea, inspired by al-Ghazālī, that the Qurʾān contains 750 (or 763, according to some) verses reflecting upon the microcosm and macrocosm of nature.[11] These verses have served scientific interpretation for centuries, frequently being used as support for self-referencing allusions from the Qurʾān, which function as a form of self-promotion, introducing the Qurʾān as a mine of science and a book of guidance that covers everything. Qurʾān 6:38, for example, presents an interesting combination of the Qurʾān promoting itself and addressing natural issues: "There is not an animal (that lives) on the earth, nor a being that flies on its wings, but (forms part of) communities like you. Nothing have we omitted from the Book, and they (all) shall be gathered to their Lord in the end."

Qurʾānic commentators with a naturalist tendency have paid specific attention to Qurʾān 6:38. According to al-Rāzī, this verse may reflect a miracle (al-Rāzī [1420] 2000, xii:523), suggesting that "nothing have we omitted from the Book" refers to the "Preserved Book" in the heavens, which includes all details about all beings, as well as the Qurʾān itself

(al-Rāzī [1420] 2000, xii:526). Al-Rāzī puts forward a theological question, namely, that someone may ask: "But the Qurʾān does not address medicine, arithmetic, sciences, human communities, and their doctrines in detail" (al-Rāzī [1420] 2000, xii:527). Al-Rāzī's use of the phrase "in detail" (*al-tafāṣīl*/التفاصيل) indicates that he believes in the "scientific essence of the Qurʾān" in general but agrees that such scientific essence is not described in detail. He then provides an answer that "the whole or most of the Qurʾānic verses are in accordance with the purpose of the Qurʾān's revelation, which is to elucidate the religion, the knowledge, and essence of God and His rules" (al-Rāzī [1420] 2000, xii:527). Al-Rāzī's explanation demonstrates that allusions to divine laws, science, creatures, and the universe in the Qurʾān should be considered means of realizing who God is and "how His rules for the universe are described in the Qurʾān" (al-Rāzī [1420] 2000, xii:527–29). In line with al-Rāzī, al-Nīsābūrī presents a similar interpretation of Qurʾān 6:38. According to al-Nīsābūrī, the Qurʾān does not provide full details about many sciences or human communities and their practices. He agrees that the Qurʾān is the book of principles and foundational elements, not secondary and subsidiary issues, and that there is no science but that whose "origin and base [are] found in the Qurʾān" (al-Nīsābūrī [1416] 1996, iii:76). For al-Rāzī and al-Nīsābūrī, the Qurʾān is the source of all sciences, which can be discovered through investigation, layer upon layer. This idea has evolved over centuries; as the concepts of nature and science have evolved, so too have the Muslim definitions of nature and science in the Qurʾān.

The Qurʾānic affirmation of Muḥammad's divine knowledge (Qurʾān 4: 113) leads to a discussion of how Muslims have located him in their pedagogic and scientific circles. Traditions about the Prophet instruct Muslims whether to dedicate their lives to science and address issues related to nature and the cosmos directly. Some of Muḥammad's statements are strict in commanding Muslims what and how to study. For instance, a prophetic *ḥadīth* is against the acquisition of some scientific knowledge states:

مَنِ اقْتَبَسَ بَابًا مِنْ عِلْمِ النُّجُومِ لِغَيْرِ مَا ذَكَرَ اللّٰهُ فَقَدِ اقْتَبَسَ شُعْبَةً مِنَ السِّحْرِ. الْمُنَجِّمُ كَاهِنٌ والكاهنُ ساحرٌ والساحرُ كافرٌ

> If anyone acquires a part of the science of the stars [astrology] for a purpose other than what God has stated, he has acquired a discipline of magic. That astrologer is a *kahin* [prognosticator], the *kahin* is a magician, and the magician is an infidel. (Sunnah.com, al-Tabrīzī, Book 23, Hadith 87)[12]

This statement from the *ḥadīth* clearly draws a line for Muslims who consider science a vehicle for learning about God. One of the oldest known mystical Qurʾānic commentaries is *Kashf al-asrār waʿuddat al-abrār* (*The Unveiling of the Secrets and the Provision of the Pious*), ascribed to Rashīd al-

Dīn al-Maybudī.[13] Regarding Qurʾān 2:144 ("We see the turning of thy face [for guidance to the heavens]: now Shall We turn thee to a Qibla that shall please thee. Turn then Thy face in the direction of the sacred Mosque […] The people of the Book know well that that is the truth from their Lord. Nor is Allah unmindful of what they do"), al-Maybudī says:

> و بر جمله بدانک علم نجوم بر چهار قسم است: یک قسم از آن واجب، و آن علم شناخت اوقات نماز است […] قسم دویم مستحبّ است، و آن شناخت جهات و طرق است رونده را در برو بحر […]؛ قسم سیم مکروه است، و آن علم طبایع است بکواکب و بروج. قسم چهارم حرام است، و آن علم احکام است بسیر کواکب. و […] و آن علم زنادقه است، و الیه اشار النبی « مَنِ اقْتَبَسَ عِلما مِنْ النُجُوم اقْتَبَسَ شُعْبَةَ مِنْ السِحْر»

> And be aware that the science of stars [astronomy] is divided into four: (a) the first type is compulsory, which is about recognizing the prayer hours and direction (*qibla*) […]; (b) the second type is permissible, by which one may understand directions and roads used by travelers of land and ocean routes […]; (c) the third one is reprehensible, which is the knowledge of climates by means of planets and the mansions of the stars; (d) and the fourth type is the forbidden one, and that is about legal and life rules based on the stars' movements, and […] it is a heretical science, as stated by the Prophet "anyone [who] acquires this part of the science, he has acquired a discipline of magic." (al-Maybudī [1371] 1992, i:401).

On the other hand, there are several encouraging reports ascribed to the Prophet that prompt Muslims to acquire scientific knowledge. Muslim literature is also replete with direct scientific and therapeutic references ascribed to Muḥammad, some of which were already parts of popular medical techniques during his time. Historical reports confirm that medical techniques such as cauterization and cupping highlighted in prophetic traditions were known in the pre-Islamic Near East, including in Arabia (see Khan 2013). Several *ḥadīth* collections refer to the Prophet's comments on the healing aspect of cupping. Jabir bin ʿAbdullah says that he paid al-Muqanna a visit during his illness and said, "I will not leave till he gets cupped, for I heard Allah's Messenger saying, 'There is healing in cupping'" (Sunnah.com, al-Bukhārī, Book 76, Hadith 19). The *ḥadīth* collections also refer to Muḥammad's statements about therapeutic herbs, seeds, fruits, and plants (e.g., olives and dates) whose names are mentioned in pharmacological sources as well as the Qurʾān.[14]

One may conclude that, according to Muslim theology, all of the scientific allusions in Muslim exegetical works and *ḥadīth* collections have a divine message for their readers and followers that the Qurʾān and its messenger are infallible sources of knowledge and that the Qurʾān is superior to other holy texts. Thus, these scientific allusions are often used in modern Muslim theology, Daʿwah and further religious missions.

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Notes

1. Such holidays include the Islamic awareness days/weeks that are now held worldwide and are a major instrument of Daʿwah (Muslim mission) in the West.
2. Also, this addition was a specific motivation for Shīʿī and Sufi communities, which wanted to ascribe miraculous powers to their saints and leaders, as is evident in their medical collections, such as *Ṭibb al-Riḍā*, which concerns the medical prescriptions of the eighth Shīʿī Imam, ʿAlī b. Mūsā al-Riḍā (d. c. 818).
3. The work is known as *al-Risāla al-Dhahabiyya* (The Golden Treatise) and was prepared in the Abbasid court of al-Maʾmaūn (d. 833). This treatise was reviewed, translated, and interpreted a long time ago, and its editions have often been produced by Shīʿī figures. It aims to demonstrate that ʿAlī ibn Mūsā al-Riḍā is superior to other physicians and philosophers from Christian and Indian backgrounds (e.g., Masawaiyh (Mesue), Jabrʾīl ibn Bukhtīshūʿ) (see Zaynī n.d., 20). It should also be noted that another Shīʿī therapeutic source is *Ṭibb al- Ṣādiq*, ascribed to the sixth Shīʿī Imām, Jaʿfar al-Ṣādiq. In contrast to *Ṭibb al-Riḍā*, it is a modern product from the early decades of the twentieth century CE. I have a study about this forthcoming.
4. The translations in this article and further two parts are based on the work of Yusuf Ali, which can be found here: www.quran.com
5. Assuming we accept the dating and authenticity of Muqātil's commentary.
6. On the theory of miraculousness in early Islam, see Wansbrough (1976), Thomas (2011), and Karimi-Nia (2013), among others.
7. Such as Adnan Rashid.
8. Sometimes referred to as just al-Ghazālī'.
9. On the comprehensive approach of al-Ghazālī to science, see Malik's monograph, *Islam and Evolution* (2021), a major contributor to the field of Islam and science.
10. Most Islamic exegetical literature in Southeast Asia originated in the Middle East and South Asia (see Riddell 1984; Feener 1998; Daneshgar, Riddell, and Rippin 2016).
11. In the 2018 YouTube show "Wissenschaft und Islam," Zakir Naik claims that there are more than 1,000 verses about science in the Qurʾān.

12. For the online version of the *ḥadīth*, see www.sunnah.com
13. There have been some debates about the origin of this work.
14. Traces of using natural sciences to interpret Qurʾānic verses may be found in Muslim Islamic stories (*hikayat*). I will have a forthcoming study about this issue.

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