

Concept of Science in Islam

Science and religion are two distinct worldviews that offer frameworks for understanding the external world. Although their methods and content vary, both profoundly contribute to human knowledge. This article explores the complex and nuanced relationship between science and Islam. While some argue that science and religion are incompatible, this article demonstrates how scientific thinking aligns with many Islamic principles and traditions. The relationship between Islam and science is multifaceted, shaped by history, culture, and theology.

The Nature of Science: Tentative, Subjective, and Evolving

Science systematically pursues knowledge based on observation, evidence, and empirical research. It is often characterized by its tentativeness, subjectivity, and capacity for change. Scientific theories and laws are not set in stone; they evolve as new evidence emerges or existing evidence is interpreted in new ways. This dynamic nature of science, which emphasizes discovery and revision, contrasts with the perception of religion as static and unchangeable. However, a deeper look reveals that Islamic tradition has fostered scientific inquiry in many ways.

Islamic Worldview and Science

Like other major world religions, Islam encompasses a distinct worldview that includes beliefs about ultimate reality, ethics, and the nature of existence. Central to the Islamic faith is the belief in one God ([Allah](#)), who is the Creator of the universe. [Muslims](#) believe that [the Qur'an](#) is the final revelation of God and provides guidance for all aspects of life, including knowledge and learning.

The Qur'an contains numerous verses encouraging observation, reflection, and inquiry into the natural world, which have historically stimulated scientific research in Muslim societies. The phrase "Kun fa ya kun" (Be, and it is) from the Qur'an resonates with the scientific explanation of creation, including the Big Bang theory, as a divine act. While science offers empirical explanations for phenomena, Islam offers theological interpretations that provide meaning beyond the material world.

Science in Islamic History: Contributions and Developments

The medieval Islamic world made significant contributions to the advancement of science, especially during the Golden Age of Islam (8th–14th centuries). Muslim scholars excelled in various fields, including mathematics, astronomy, medicine, and chemistry. Islamic laws of inheritance contributed to the development of algebra, and the need for accurate timekeeping for daily prayers inspired advancements in astronomy and mathematics.

Five Pillars of Islam and Scientific Parallels

[The Five Pillars of Islam](#)—faith (Shahada), [prayer \(Salat\)](#), charity ([Zakat](#)), [fasting](#) (Sawm), and pilgrimage ([Haji](#))—demonstrate the integration of practical aspects of life with spiritual practices. Science has played a role in facilitating these religious duties, such as determining the direction of Mecca for prayer or the timing of Ramadan. The lunar calendar, used in Islamic tradition, requires precise astronomical calculations, further emphasizing the connection between religion and science.

Methodological and Epistemological Considerations

The relationship between Islam and science is complex, transcending simple categorizations like "antiscientific" or "scientific." Islam encourages knowledge-seeking, both spiritual and empirical. Many Islamic scholars argue that science and [religion](#) are complementary, with each offering insights into different dimensions of existence. While science focuses on observable phenomena, Islam offers explanations for the metaphysical realm and ultimate purpose.

Islamic philosophy, particularly during the medieval period, engaged deeply with scientific thought. Scholars such as Ibn Sina (Avicenna) and Al-Farabi contributed to both Islamic theology and scientific inquiry, merging philosophical and empirical methods to explore natural phenomena.

Science in Islam: Parallels and Divergence

The relationship between Islam and science is complex, nuanced, and rooted in a worldview where belief and knowledge are intertwined. In Islam, science and the study of nature are integral parts of the broader pursuit of knowledge, reflecting the concept of *Tawhid* (the Oneness of God). This section explores both the parallels and divergence between Islamic thought and modern science, using selective evidence to illustrate their interconnectedness and points of divergence.

Parallels Between Islam and Science

Scientific Facts in the Qur'an

From an Islamic perspective, nature is not a distinct or separate entity; it is viewed as a manifestation of divine signs, or *Ayat*, pointing toward God's existence and unity. As the Qur'an is believed to be the final revelation for guiding humankind, it contains references to natural phenomena that, over time, have been interpreted in the light of scientific discovery. This belief has historically encouraged the pursuit of science in Islamic civilizations, particularly from the 8th to 16th centuries, where scientific inquiry was seen as an act of religious merit.

One of the most significant examples of this is the Qur'anic description of the creation of the universe, which bears a striking similarity to the Big Bang theory. In Surah Al-Anbiya, the Qur'an mentions that the heavens and earth were once a "joined entity" before being separated—an idea remarkably close to the modern cosmological model of an initial singularity leading to the expansion of the universe.

Similarly, the Qur'an provides insight into the spherical nature of the Earth long before it was scientifically established. Verses from Surah Luqman and Surah Al-Zumar describe the merging of night and day in a gradual process, which would only be possible if the Earth were spherical, not flat. Moreover, in Surah Naaziyaat, the Earth is referred to as "egg-shaped"—a term derived from the Arabic word *daha*, which refers to the shape of an ostrich egg, closely resembling the Earth's oblate spheroid form.

Biology and Embryology

The Qur'an also includes descriptions of human development, such as in [Surah Alak](#), where the initial stage of the embryo is described as a "leech-like substance," a fact only recently confirmed by modern embryology. This alignment with scientific discovery is notable in the work of prominent figures like Professor Keith L. Moore, a leading embryologist, who acknowledged the striking accuracy of these Qur'anic descriptions, despite their revelation centuries before such knowledge became scientifically verified.

These examples show that many Qur'anic verses offer descriptions of natural phenomena that have parallels with scientific discoveries made much later. Muslims consider these as evidence that the Qur'an is not a book of science, but a book of signs, encouraging the exploration of knowledge and reflection upon the world.

Divergence Between Islam and Modern Science

While there are significant parallels, there are also key divergences between Islamic views on science and the modern scientific framework. These divergences arise primarily from differing epistemological foundations. Islam views knowledge, including scientific knowledge, as part of a sacred pursuit aimed at understanding God's creation. The concept of *Tawhid* links all forms of knowledge, including science, to the divine purpose and ultimate reality, which contrasts with the secular and often materialist worldview of modern science.

Epistemology and Methodology

Modern science is typically rooted in empirical methods and natural laws, which sometimes present challenges to traditional Islamic views. The scientific method, as developed in the West, emphasizes observation, experimentation, and skepticism, often relegating metaphysical or spiritual considerations to the background. Islamic science, on the other hand, integrates empirical knowledge with divine revelation and intellectual intuition, thus encompassing both the material and the spiritual realms of existence.

This divergence is evident in the ongoing debate about the role of metaphysical principles in science. Some thinkers, like Seyyed Hossein Nasr, argue that Islamic science operates within a holistic framework that unites different methodologies and views nature as interconnected and purposeful. In contrast, modern science tends to adopt a more reductionist approach, focusing on physical explanations while often disregarding metaphysical interpretations.

Islamic Views on Modern Science and Technology

The encounter between the Islamic world and modern science, particularly during the 18th and 19th centuries, was largely driven by practical concerns. Muslim societies recognized the need for modern technology to maintain military and political power, yet the philosophical and intellectual aspects of science were sometimes seen as secondary. Figures like Kamal Atatürk called for adopting modern science to advance society, even if it meant setting aside traditional beliefs. This perspective led to significant tension between traditionalists and reformers within the Islamic world.

Contemporary Debates

Today debates about the compatibility of Islam and science continue, particularly around the ethical, epistemological, and metaphysical dimensions of scientific inquiry. Scholars like Abdus Salam, a Nobel Prize-winning physicist, emphasize the compatibility of Islamic teachings with the pursuit of science, noting that the Qur'an encourages believers to reflect upon and study the natural world. However, other thinkers caution that modern science, with its reliance on natural laws, sometimes conflicts with Islamic beliefs about God's sovereignty and intervention in creation.

What is the difference between science and Islam?

The relationship between science and Islam can be understood by distinguishing their approaches to understanding the universe.

1. Science:

- o Science seeks to understand the natural world through observation, experimentation, and the development of theories. It explains the universe's formation based on evidence and models derived from empirical data.
- o For example, the **Big Bang Theory** is a scientific model that explains the universe's beginning as a massive expansion that occurred around 13.8 billion years ago. According to this model, the universe has not always existed in its current form but emerged from an extremely hot, dense state. Scientific theories like this one are based on evidence gathered from observations of cosmic background radiation, the movement of galaxies, and other phenomena.
- o Science typically refrains from addressing questions of purpose or ultimate causes, focusing instead on the "how" rather than the "why."

2. Islam:

- o Islam, like other faiths, offers a worldview rooted in religious belief. It teaches that the universe is the creation of **Allah (God)**, brought into existence as an act of His divine will and command. Verses in the Qur'an often describe the heavens, the Earth, and all of existence as a manifestation of God's power and wisdom. For example, the Qur'an (21:30) mentions, "Do not the disbelievers see that the heavens and the earth were a closed-up mass, then We opened them out?"—a verse that some interpret as being consistent with the idea of the Big Bang.
- o Islam holds that creation has a purpose, with God as the ultimate cause. The purpose of creation and the laws governing it are explained within the framework of divine revelation.

Points of Difference:

- **Origin vs. Explanation:** Science focuses on **explaining** how natural processes unfold (like the Big Bang), while Islam attributes the **origin** of everything to God's will.
- **Purpose:** Science does not deal with purpose or meaning in the creation of the universe, while Islam sees the universe as purposefully created by God.
- **Methodology:** Science uses empirical methods and relies on testable hypotheses, whereas Islam relies on faith, divine revelation, and theological teachings to explain the universe's creation.

However, many Muslim scholars and scientists believe there is no fundamental conflict between Islam and scientific inquiry. They view scientific discoveries as ways of understanding God's creation more deeply. Some interpret Quranic verses as being in harmony with scientific findings, while maintaining that ultimate knowledge of the universe's origin lies with God.

Who is the father of science in Islam?

Ḥasan Ibn al-Haytham, commonly known as Alhazen, was indeed a pivotal figure during the Islamic Golden Age. Born around 965 in present-day Iraq, he made significant contributions to various fields, particularly optics, mathematics, and astronomy. His most famous work, the "Book of Optics" (Kitāb al-Manāẓir), laid the foundations for the scientific study of light and vision, challenging the then-prevailing theories of vision and optics.

Alhazen is often credited as one of the first scientists to apply the scientific method rigorously, emphasizing experimentation and observation. His influence extended beyond the Islamic world, impacting later European scholars during the Renaissance. His work not only advanced knowledge in optics but also contributed to the development of camera technology and the understanding of visual perception.

Conclusion

The relationship between Islam and science is neither a simple reinforcement nor a complete negation of one another. There are profound parallels, especially when interpreting scientific facts through an Islamic lens. However, the epistemological and methodological divergence between Islamic and modern scientific frameworks also points to fundamental differences in how knowledge is understood and pursued. The ongoing dialogue between these two perspectives highlights the need for further exploration of their complex relationship, taking into account historical, cultural, and philosophical factors.

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