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# The Arab Islamic Civilisation as a Global Force for Good: A Reworked Science-Focused Historical Narrative

## **Abstract**

*From the eighth century, Muslims developed not only their knowledge in the field of theology, but also astronomy, mathematics, chemistry, medicine and other sciences. It is in the nature of Islam to encourage understanding and knowledge, research and study of nature.*

*The text wants to show that the foundations of the Islamic scientific tradition existed even before the introduction of the Greek tradition, that is, that the golden age of Islamic science began with Abdel al-Malik, a century and a half before the creation of Bayt al-Hikma in Baghdad in the 9th century.*

*For almost an entire millennium, the scientists of the Islamic civilization not only studied and analyzed the Greek (and other) sciences, but also added to them many completely new concepts that were unknown to their predecessors. The Crusades and the Mongol invasion influenced the circumstances in which Islamic science developed.*

*The slow introduction of printing technology contributed to the slowdown of scientific development, as did the cessation of the use of the Arabic language as a scientific lingua francae.*

*It is important to point out that Europe in the 12th century paid great attention to Islamic works on astronomy, arithmetic, trigonometry, optics, geometry, astrology and medicine (Mushtaq 1990).*

*The proposed narrative therefore tells us that the science that began with the Greeks came to the Arabs and Muslims where it was accepted, assimilated and rearranged. It was then transferred to Europe over the centuries, where it ultimately contributed significantly to the industrial revolution.*

**Key words:** *Islamic science, Islamic tradition, civilization, culture, Bayt al-Hikma, scientific revolution, Europe.*

The Muslims of the eighth century were not only well versed with theological Islamic ‘sciences’ which were based on the teachings of Islam but had also developed an understanding of some scientific fields of knowledge such as astronomy, mathematics, chemistry, and medicine. Otherwise, it is difficult to imagine how an assemblage of Arab tribes from the *Hijaz* –who essentially lived a nomadic existence at the start of the seventh century- would succeed in establishing a super-state in less than 100 years without having some knowledge capacity, to begin with. The favourable milieu for science they had is due to the nature of Islam which encouraged Muslims to explore and study nature as outlined in the teachings of the *Qur’an* and the *Sunnah* (Golshani 2008). Moreover, early Muslims must have quickly acquired the faculty and competence to master the art of nation-building and appreciated the knowledge or ‘science’ required to achieve such a feat.

The first century of Islam –notwithstanding some major political events- represented a period of not only military conquest exposing Muslims to new cultures and civilizations, but also one of tremendous dynamism and innovation within a milieu of curiosity to learn about the world.

The foundations of Islamic scientific tradition were thus present well before Greek sources were formally appropriated into the Islamic knowledge pool and disseminated in the 9<sup>th</sup> century (Saliba 2007). Science in the Islamic world started to flourish early as a result of patronage by leaders such as the *Umayyad* ruler *Abd al-Malik bin Marwan* (AD 646-705) who was an enlightened leader who appreciated science and what science could do for the state. Political patronage, until today, remains a critical prerequisite for science to bloom.

The birth of *Bayt al-Hikma* early in 9<sup>th</sup> century Baghdad was not an event that occurred in a vacuum. It was the culmination of at least a century and a half of the movement to Arabicize science which

was started by Abdel al-Malik. The seeds of the Golden Age of Islamic science were sowed then, probably even before. The *‘Abbāsids* were institutionalisers of science. They were followed historically by the Umayyads of al *Andalus*, and the Fatimids in Egypt. It was al-Andalus – especially the city of Toledo – that became the main conduit through which Islamic science flowed into Europe as early as the turn of the first millennium.

The Golden Age of Islamic Science lasted for the best part of a millennium (AD 700 to 1600) in a milieu that warmly and universally embraced science. Not only did scientists from the Islamic civilisation study and analyse Greek (and other) sciences but also added many completely new concepts unknown to their predecessors (Saliba 2008) (Saliba 2011). It is true that Islamic science peaked early, probably in the 10<sup>th</sup> century, but scientific activities continued in the Islamic world to the end of the 16<sup>th</sup> century. The Crusades and Mongol invasion did not have an immediate impact on science and the scientific enterprise (Saliba 2011) in Islam, but they had a mammoth impact on the milieu within which Islamic science flourished, which became starved of wealth and energy, actively attempting to repel the invaders and rebuild its devastated infrastructure. Of the effects of the foreign invasion of the Islamic world has been the political fragmentation of the single powerful Islamic state as manifested earlier by the Umayyad and *‘Abbāsīd* Caliphates.

Although the number of historically renowned scientists in the Islamic civilisation seems to have declined after the 14<sup>th</sup> century, upon careful re-examination we find that many eminent scientists appeared in or after the 14<sup>th</sup> century including the famous polymath, *Ibn Khaldun* (AD 1332-1406). Other famous scientists in the 14<sup>th</sup> and 15<sup>th</sup> centuries include *Ibn al-Shatir* (AD 1304-1375) and *Baha al-Din al-‘Amili* (1547-1622), to name but a few.

By revising the traditional narrative for the decline of Islamic science, it becomes evident that the Golden Age of Islamic science did not cease abruptly in the 13<sup>th</sup> or the 14<sup>th</sup> century. It is evident that the decline of the Islamic civilisation –including Islamic- started gradually owing to a series of external and internal factors including; the Crusades and the Mongol invasion, political fragmentation of the state and lack of patronage of science, an unappealing milieu, demographic considerations as well as strategic factors resulting in a decline of trading activities. Other factors that have contributed to the slow decline of Islamic science include; the absence of a patenting culture at a time when Europe was discovering patents in the 15<sup>th</sup> century, the slow introduction of printing and –quite possibly- the gradual abandonment of the Arabic language as the lingua franca of science, as it had been for centuries.

From the beginning of the 17<sup>th</sup> century, conditions were no longer conducive within the realms of Islam (as represented by the Ottoman Empire) for the development of science although the appropriation of technology continued. Reasons for this scientific quiescence that prevailed during the Ottoman era include social and economic disruption resulting from the weakening of the central authority – not in a dissimilar fashion to what took place during the *‘Abbāsīd* Caliphate in the 13<sup>th</sup> century – political instability, loss of territories and the diminishing revenues of the state (Ihsanoglu 2006).

An alternative watershed for the slowing down of Islamic science coincides with the unfortunate closure of the Istanbul observatory of *Taqī i-Dīn b. Marūf* in 1580; that is almost a century after the exit of Muslims from Spain in AD 1492 and the discovery of America by Columbus in the same year. Moreover, the closure of the Istanbul observatory nearly coincided with remarkable events in the West: Copernicus' revelations in *De revolutionibus orbium coelestium* in 1543, and the founding of the Accademia dei Lincei in 1603; two events that mark the start of the ascendancy of science in the West. Needless to say, Copernicus' work was based on some original research by *al-Tusi* three centuries before, the contribution of Ibn al-Shatir notwithstanding. Al-Tusi laid the foundation for the Scientific Revolution in Europe of the 16<sup>th</sup> century in 13<sup>th</sup> century Maragha.

For five centuries before Copernicus, Europe was on the receiving end of a massive surge of science from the South that started in al-Andalus around the turn of the first millennium and continued for the best part of five centuries through several conduits including Andalucía, Sicily, and Wallonia (in modern-day Belgium).

The infusion of Islamic science into Europe at the time was a repeat of what had taken place earlier during the early 'Abbāsīd Caliphate, between the Greek and Islamic cultures. Just as Baghdad had diligently sought to acquire Greek science, so Europe in the 12<sup>th</sup> century devoted great care to Islamic works on astronomy, arithmetic, trigonometry, optics, geometry, astrology and medicine (Mushtaq 1990).

By describing some of the routes through which science was transmitted into Europe including the Wallonia connection, the idea that science has always been international and free flowing across civilisations and cultures was reinforced. Knowledge started to flow from the Islamic civilisation to the West where it was absorbed and then contributed to the rise of the scientific enterprise, firstly, as an intellectual linguistic movement and then as a scientific movement. The fact that universities were starting up in Europe played a significant role in appropriating Arab and Islamic science. Here, universities in Europe renaissance preceded academies as beacons of science and the scientific endeavour, unlike the Arab/Islamic civilisation where academies were the forerunners to the madrasas. The main conclusion to be drawn from uncovering the Wallonia connection is that many of the routes that the flow of Islamic science took when it was spreading through Europe are still being discovered.

Most Western historians (with a few exceptions such as Lindberg) tend to ignore the fact that the re-discovery of Greek learning started in the 12<sup>th</sup> century, or even earlier, through Spain and the other conduits of knowledge from Islamic sources (Lindberg 1978). Further evidence to confirm the early transmission of Islamic science into Europe stems from the fact that medieval European universities were established in the 12<sup>th</sup> century primarily to assimilate the knowledge coming from Islamic sources (Nakosteen 1964). The development of medieval universities allowed them to aid materially in the translation and propagation of these texts and started a new infrastructure needed for scientific communities.

Unlike the rise of science in the Islamic civilization, which was rapid and well patronized by leaders, science in the European civilization was slowly assimilated and built up over centuries without much political patronage. Only in the 17<sup>th</sup> century can evidence of strong patronage by the kings of Europe of science and scientific endeavour be found. That is almost six centuries after the first contacts between the Europe of the Middle Ages and the Islamic civilization.

Rereading the story of the rise of Islamic Science may help in a better understanding of; the harmonious relationship that exists between Islam and science, the capacity of early Muslims to learn from others and adapt to the political realities that they became a part of and the open-mindedness they demonstrated in interacting with other cultures and civilisations.

The article firstly reiterates that world civilisations have been/are interdependent. The scientific enterprise is a trans-civilisational phenomenon and science has historically flowed from one civilisation (normally the more advanced) to another. So have forms of science institutionalisation such as academies and academy-type institutions. The proposed narrative thus tells us that science has flowed from the Greeks to the Arabs and Muslims where it was embraced, assimilated and revamped. It was then transmitted into Europe over centuries, contributing in no small part eventually to the Industrial Revolution.

As the quintessential 'Force for Good', it was the Islamic civilization that led Europe out of dark ages into the era of Enlightenment and gave rise to its Renaissance.

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## **Arapsko-islamska civilizacija kao globalna 'sila za dobro': Preinačeni, na znanost usmjereni povijesni narativi**

### **Sažetak**

*Od osmog stoljeća muslimani su razvijali ne samo svoja znanja u području teologije, nego i astronomije, matematike, kemije, medicine i drugih znanosti. U prirodi je islama poticanje razumijevanja i znanja, istraživanja i proučavanja prirode.*

*Tekst želi pokazati da su temelji islamske znanstvene tradicije postojali i prije upoznavanja grčke tradicije, odnosno, da je zlatno doba islamske znanosti započelo s Abdel al-Malikom, stoljeće i pol prije nastanka Bayt al-Hikme u Bagdadu, u 9. stoljeću.*

*Skoro čitavo jedno tisućljeće znanstvenici islamske civilizacije ne samo da su proučavali i analizirali grčke (i druge) znanosti, već su istima dodali i mnoge, potpuno nove koncepte koji su njihovim prethodnicima bili nepoznati. Križarski ratovi i mongolska invazija utjecali su na okolnosti u kojima se islamska znanost razvijala.*

*Sporo uvođenje tiskarske tehnologije doprinijelo je usporavanju znanstvenog razvoja jednako kao i prestanak korištenja arapskog jezika kao znanstvene lingua francae.*

*Bitno je istaknuti da je Europa u 12. stoljeću veliku pažnju posvetila islamskim djelima o astronomiji, aritmetici, trigonometriji, optici, geometriji, astrologiji i medicini (Mushtaq, 1990).*

*Predloženi narativ nam, stoga, govori da je ona znanost koja je započeta s Grcima došla do Arapa i muslimana gdje je prihvaćena, asimilirana i preuređena. Zatim je stoljećima prenošena u Europu, gdje je, u konačnici, značajno doprinijela industrijskoj revoluciji.*

**Ključne riječi:** *islamska znanost, islamska tradicija, civilizacija, kultura, Bayt al-Hikma, znanstvena revolucija, Europa.*



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