

The Contribution of Islamic Civilization to the Scientific Enterprise of the Modern World

إسهامات الحضارة الإسلامية في النهضة العلمية للعالم المعاصر

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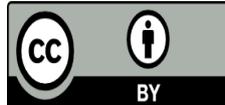
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☆ Dr. Fozia Naeem ☆ Dr. Hafiz Masood Qasim ☆ Asad Ghaffoor

Abstract

The contributions of the Islamic Civilization since its advent in Arab, it has always produced numerous intellectuals, learned people, artists and scientists. An account of the development of Islamic Civilization in Maktabs and Madrasas in Arab since the First century A.H. has influenced non-Muslims by different generations, continuing its enterprising factor and still exists. Masjid, Maktab and Madrasas are meant for theological studies, however, these produced many scholars and learned men, not in theology but in other subjects as well. The products of Islamic Civilization influenced the education, culture, language as well contributing in Islamic sciences, Scientific Enterprises, social sciences, literature, art and Culture. The present paper discusses few of the contributions, which have received recognition, not only in Arab but also on global way. This knowledge was transferred to Western Europe and subsequently played an important role in revitalizing a climate of learning and exploration in Europe, leading to the Renaissance in the sixteenth and seventeenth centuries. Although, the Muslim community has a rich heritage of its art and architecture, language and literature, culture and civilization, history and archaeology, Chemistry, Medicine, Pharmacology, etc. thus the paper highlights the glorious contributions of Islamic civilization that have now been filtered from Islamic Civilization to the Western Civilization.

Keywords: Islamic Civilization, Knowledge Transfer, Scientific Enterprise, Pharmacology, Western Civilization.

Introduction:

Since the inception of Islam from 610 AC. Islamic civilization initiated its material and spiritual role for the formation of worldly and spiritual advancement in human life. When it is pondered over the history of Islamic civilization, we found that the seventh to fifteenth century of this very period is titled as the premium period of the Islamic Antiquity.

Scarcely some of us have an insight that the today affluent Europe had gone through a long striking era called "Dark Ages". It went on for in excess of a thousand years of inertia, backwardness and stagnation reaching out from 15th AC. until Renaissance period. Muslim researchers and different erudite people introduced this time with achievements that were genuinely bewildering with advancements in every single conceivable territory including modern sciences.

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It is above board that the advancement of Islamic civilization drove Europe out of gloomy and dismal eons into the time of brilliance and offered climax to its Renaissance.

The Muslims have ever been the assets to create harmony between Islamic Civilization and Modern Science in the gamut of history. For about a century, there are certain scholars who have endeavored to prove the mutual relationship between Western scientific and educational concepts. It was an Islamic civilization that enterprises in various spheres of life like medicine, pharmacy, pharmacology, mathematical science, astronomy, engineering, optics, aviation etc. (Al-Faruqi and Nasseef, 1981).¹

Islamic Civilization has many plausible periods in its various spells. One of the best Golden Eras, the peiod between seven to fifteen century, is called its Golden Age. During this period, knowledge was prominently focused to seek. There were numerous scholars who paved the way of Islamic Civilization with its great achievements lik Ibn e Sin, Musa Al Khawarzami, Razi, Jabi bin Hayyan, Abul Qasim Zahrawi, Ghazali, Omer Khayyam, Al Biruni are sufficed here who evoke the glory of Islamic civilization and excelled not in religious sciences but also in Matehmatics, Astronomy, Astrology, Algebra, Physics, Chemistry, Biology, Optic, Aviation and Medicine. Here Islam as religion was considered as a set of perceptive approaches and ethics that encompassed all the spheres of life. It resulted in a sound establishment of Islamic Civilization which motivated the descendent to work for the motivation (khattani, 1976)²

Prevailing Obliviousness:

The Islamic Civilization has plenty of achievements on its page that is being ignored by the Western historians. They downplay the holistic golden period of the Muslim Scholars who played pivotal role in the formation of society. It is often observed that the mass media often builds general public hold that the Muslims had nothing to do with the scientific evolution except terrorism. The same lesson has been penetrated through the syllabi that the intellectual roots can be found only in Greek and Roman Civilization, and that after a thousand years sleep in the Dark Ages, Europe astoundingly resuscitated to its Greco-Roman legacy. This re-discovery headed them to the advancement and Revitalization and scientific revolutions in subsequent way. If the role of Muslim World is emerged, it is mentioned only in the corner or footnote that they merely preserved the Greek Philosophers' heritage to pass it on to the West.

Literature Review:

Thousands of books have been published in addition to articles, features, analyses and commentaries published in the western newspapers and magazines regarding Islam and Muslims. Hundreds of movies, dramas, documentaries and other television programs have been aired having a negative and sometimes, heavily negative image of Muslims and Islam. Edward Said admits that Islam is covered negatively by most of the western media organizations. Said argues that in the West, military, academic institutions are the key knowledge producing institutions constructing western understanding of Islam.³

1 Al-Faruqi, R. I. and Nasseef, O. A. (eds). *Social and Natural Sciences: (Jeddah: The Islamic Perspective,1981)*, p.58

2 Kettani, M.A. *Moslem contributions to the natural sciences. Impact of Science on Society*,(Cambridge: Cambridge University Press, 1976), p. 135-147

3 Said, Edward. *Covering Islam*, (New York: Vintage, 1970), p.97.

Aim of Research:

The aim of Research is to explore the contribution of Islamic Civilization to the scientific enterprise of the modern world.

Islamic View of Nature:

The seventh to fifteenth century of Islamic Civilization titled as the golden in Islamic History. There are certain Muslim scholars who contemplated the meanings of Quran, analyzed it in semantic and pragmatic way and explored the natural phenomenon of the Universe to recognize "Allah Almighty". This contribution was a scientific enterprise in the pool of Islamic civilization. Apparently it looks complex but spanned over the rational approach of various theorists to contemplate it. Its objective was just to seek and recognize Allah Almighty with the signs of the universe and how this nature can be used for the benefit and betterment of mankind. Nature can be used for the benefit of mankind and its various bounties can also be used as food for thought among the people as is stated in the Holy Quran:

إِنَّ فِي خَلْقِ السَّمَاوَاتِ وَالْأَرْضِ وَاخْتِلَافِ اللَّيْلِ وَالنَّهَارِ لآيَاتٍ لِّأُولِي الْأَلْبَابِ

*"Verily, in the creation of the heavens and the earth, and in the succession of night and day, there are indeed messages for all who are endowed with insight"*⁴

In the Golden Era, the Muslim scholars were greatly inspired by the Quranic invitation of insight. They started to study the Quran and irritated their perceptions to ponder over the meanings of Quran. The Holy Quran also illustrates the affiliation between man and nature, and how this passage provokes the Muslim Intellectuals to study natural phenomenon:

إِنَّ فِي خَلْقِ السَّمَاوَاتِ وَالْأَرْضِ وَاخْتِلَافِ اللَّيْلِ وَالنَّهَارِ وَالْفُلْكِ الَّتِي تَجْرِي فِي الْبَحْرِ بِمَا يَنْفَع النَّاسَ وَمَا أَنْزَلَ اللَّهُ مِنَ السَّمَاءِ مِنْ مَّاءٍ فَأَحْيَا بِهِ الْأَرْضَ بَعْدَ مَوْتِهَا وَبَثَّ فِيهَا مِنْ كُلِّ دَابَّةٍ وَتَصْرِيفِ الرِّيَّاحِ وَالسَّحَابِ الْمُسَخَّرِينَ السَّمَاءِ وَالْأَرْضِ لآيَاتٍ لِّقَوْمٍ يَعْقِلُونَ

*"Verily, in the production of the sky and of the earth, and the progression of night and day: and in the boats that speed through the ocean with what is helpful to man: and in the dilutes which God sends from the sky, giving life in this manner to the earth after it had, been dead, and making all way of living animals duplicate subsequently: and in the difference in the breezes, and the mists that run their designated courses amongst sky and earth: [in all this] there are messages for sure for individuals who utilize their reason"*⁵

Allah has created man as his "vice" and trustee, for the manifestation of the universe, to get the benefits from here, to exert his energy to mould his destiny and coordinate with various individuals to collaborate among themselves by taking initiatives at various occasions in the life span, otherwise, it is warned in the Holy Quran:

إِنَّ اللَّهَ لَا يُغَيِّرُ مَا بِقَوْمٍ حَتَّى يُغَيِّرُوا مَا بِأَنْفُسِهِمْ

*Verily, God does not change men's condition unless they change their inner selves;*⁶

The same has been motivated by the thinker of Pakistan Allama Muhammad Iqbal in the following way:

4 Al-Quran, Al-Imran: 190

5 Al-Quran, Al-Baqrah: 164

6 Al-Quran, Al-Ra'ad: 11

“Consequently humanity was motivated to examine, comprehend and shape the normal powers for its own particular purposes. The point to note is the general exact state of mind of the Quran which induced in its adherents a sentiment adoration and consequently made them authors of an illuminated society.”⁷

Contribution of Islamic Civilization:

Islamic Society was a multicultural having various religions, creeds, cultures, languages and traditions. In the initial history of Islam, it was limited only to the Arab. But as the Muslims had various conquests, it encompassed various territories like Turk, Africa and Europe and even beyond. There, the people of various cultures, religions, sects, casts, creed and color, and having ethnical difference they exerted them to work under the umbrella of Islamic Civilization. Thus, they produced a unique culture of learning, knowledge and research. Here, a major contribution made by these scholars is presented as under:

Education:

Islam, since its inception, placed a high premium on education and it enjoyed a long and rich intellectual tradition. The very first and foremost insist preaching of Islam is knowledge. The Holy Prophet SAW was bestowed with the prophet hood, the revelation was started at him, the very first words of the revelation were:

اقْرَأْ بِاسْمِ رَبِّكَ الَّذِي خَلَقَ - خَلَقَ الْإِنْسَانَ مِنْ عَلَقٍ - اقْرَأْ وَرَبُّكَ الْأَكْرَمُ - الَّذِي عَلَّمَ بِالْقَلَمِ - عَلَّمَ
الْإِنْسَانَ مَا لَمْ يَعْلَمْ

*READ in the name of thy Sustainer, who has- - created man out of a germ-cell
- Read - for thy Sustainer is the Most Bountiful One - who has taught [man] the
use of the pen - taught man what he did not know!*⁸

قُلْ هَلْ يَسْتَوِي الَّذِينَ يَعْلَمُونَ وَالَّذِينَ لَا يَعْلَمُونَ

*Say: “Can they who know and they who do not know be deemed equal”*⁹

يَرْفَعُ اللَّهُ الَّذِينَ آمَنُوا مِنْكُمْ وَالَّذِينَ أُوتُوا الْعِلْمَ دَرَجَاتٍ

*God will exalt by [many] degrees those of you who have attained to faith and,
[above all,] such as have been vouchsafed [true] knowledge*¹⁰

وَقُلْ رَبِّ زِدْنِي عِلْمًا

*"O my Sustainer, cause me to grow in knowledge!"*¹¹

Such verses provide a forceful stimulus to seek and enhance knowledge, learning and flourishing of knowledge. On the basis of these verses, The Holy Prophet SAW produced thousands of his companions and then they themselves strived for spreading knowledge and they did produced thousands of scholars and so on.

Beside fundamental incidental data, learning and seeking after instruction are a vital piece of Islam.

Conforming to the disclosures of Qur'an, which began with the word Iqra - read or present, the Prophet SAW made it obligatory for Muslims to get taught. In this manner nearby masajid, Muslims set up madrassas to show youngsters and adults alike. Furthermore, learning and instructing turned out to be so across the board among Muslims that they turned into its light bearers for whatever is left of world. Extraordinary focuses of learning were

7 Iqbal, Muhammad. The Reconstruction of Religious Thoughts in Islam (Pakistan: Institute of Islamic Centre), p.66

8 Al-Quran, Alaq:1-5

9 Al-Quran, Zumur:9

10 Al-Quran, Mujadalah:11

11 Al-Quran, Taha: 114

established in Cordova, Baghdad, Cairo and Damascus. This scholarly community later on filled in as models for the colleagues in Europe.

The historical city Baghdad was established by the Abbasid ruler al-Mansur in 762 to 790. It turned into a focal point of erudition under the famous ruler Harun ur Rashid. He welcomed people from various nations with diverse foundations for exchange and gaining from one another. His descendent, al-Mamun ur Rasheed established bait al-Hikmat or House of Wisdom which was given to deciphering philosophical and logical works from the Greek and different dialects and filled in as open library.

It should be called attention to that bayt al-Hikma did not just serve to keep the Greek firsts from eradication, as is by and large recognized, yet in addition as the gathering place for academic exchange, communications, and talks. Numerous unique productions in an assortment of zones turned out from Bait al-Hikmat. What's more, it kept on filling in all things considered. He was sacked by Mongols in 1258.

All through the Excellent time Arabic turned into the dialect of scholarship science and progression. For instance, the considerable Jewish researcher Maimonides, an understudy of the popular Imam al-Rushd, composed his most wonderful work in the Arabic dialect.

The first and one of the best colleges was Al-Zaytuna in Tunis, Tunisia, and numerous Muslim researchers moved on from it. It was the most punctual college on the planet worked around 703. The Islamic party Al-Nahda is right now occupied with restoring its reality status.

At that point in 859, Fatima al-Firhi, the Princess, little girl of a well off business person established the main degree college in Fez, Morocco, and her sister Miriam established the neighboring mosque. The complex wound up known as the al-Qarawiyyin mosque and college.

Another extraordinary scholarly focus, the Al-Azhar was established in 970 in Egypt. It began as a mosque and turned into the academia in the Islamic world. It was named after Fatima, the youngest daughter of Prophet SAW. She was additionally called as al-Zahra - the iri descent. So Al-Azhar implies the enlightened one, a meriting name for this awesome establishment.

Medicine:

In the history of Islamic Civilization, there were many prominent Muslim pharmacists. The very first among those is Al-Razi(865-925) and Bu Ali Sina(980-1037). The Europeans knew them with their Latinized names Razes and Avicenna respectively.

Both composed artful culminations that were thought about specialist in restorative colleges in Europe until the eighteenth century. Muhammad Al-Razi's al-Judari wal Hasba, on smallpox, measles and chickenpox spoke to the main exact clinical investigation of irresistible illnesses. His other book, called al-Hawi or the Comprehensive Book, incorporated every one that was known in prescription alongside records of his own tests and perceptions.

Two Muslim doctors who end up known in Europe amid this period were Ibn Sina and Al Razi. Ibn Sina committed his life to the investigation of pharmaceutical, theory and different branches of science.¹² Eminent all through medieval Europe as Avicenna, he built up free healing centers and created medications for infections utilizing herbs, hot showers, and even real science.¹³ His celebrated book The Canon of Medicine was converted into Latin in the

12 Meyers, E.A. Arabic Thought and the Western World in the Golden Age of Islam (New York: Fredrick Ungar Publishing co.), p.51-59

13 Beshore, G. Science in Early Islamic Culture(New York:NY F Watts), p. 84-94

twelfth century and it was utilized as a part of restorative schools all through Europe until the approach of present day science .The Canon of Medicine contained all Greek therapeutic information together with Arabic elucidations and commitments.

Abu Ali Sina is known as the ruler of doctors, since he composed the most powerful therapeutic course book called al-Qanun fi al-Tib or the Canon of Medicine that summed up all current restorative information. In it, he presented the infectious idea of irresistible illnesses, the utilization of isolate to control spread of diseases, neuropsychiatric conditions, for example, epilepsy, stroke and dementia, and intricacies of diabetes.

He proposed that every new solution ought to be tried for their viability on creatures and people in clinical trials to decide any hurtful symptoms previously they are generally utilized, as the US Food and Drug Administration does now. The French respect Al-Razi and Abu Ali Sina by recognizing them at the University of Paris.

It was around 1,000 AC that Qasim al-Zahrawi distributed his eminent 1,500 page represented reference book of surgery. It was utilized as a kind of perspective in Europe for the following 500 years. He is credited for growing new treatment strategies going from dentistry to labor. Among his developments was utilization of the dissolving feline gut to stich wounds. He likewise played out the primary caesarian task. He surgical devices, for example, surgical blades, bone saws, and forceps are as yet utilized as a part of doctor's facilities.

Hospitals:

Another priority of Islamic Civilization was establishing hospitals to take care of the sick and needy. These hospitals were several centuries in advance of the Europeans. Europeans took their cue from these institutions and their teaching methods as standard for students in medical schools. Even adopted practices such as taking students on ward rounds in hospitals attached to schools. These Muslim hospitals provided free treatment and care to anyone in need, a quality that is sorely missing in the United States. The policy was based on the Muslim tradition of caring for the sick and needy.

Astronomy:

In Islamic Civilization, Astronomy has ever been an excellent characteristic. Among the Muslim rulers, it was Mamooun ur Rasheed in Umayyad Dynasty who constructed present day cosmic observatories in Baghdad and Palmyra in 829. With the knowledge gave by this organization, the Muslim space experts found numerous stars by the Arabic names. The Greek cosmologist Ptolemy had built up a galactic hypothesis about the developments of the moon and planets; and had set the earth at the focal point of the universe. With a specific end goal to make up for mistakes in perception he had credited extra developments to the planets. Al-Khwarizmi was one of the primary researchers to produce a point by point galactic table (zij). This cosmic table gave the methods for computing the places of the stars and planets. Accordingly, every stargazer composed his own zij, endeavoring to make it more precise than those arranged previously.¹⁴

Al-Farghani, in the ninth century wrote a detailed account of Ptolemy's Almagest and his book was used throughout Europe and central Asia for the next 700 years¹⁵

Mathematics:

Muslims derived their theory of numbers (*'ilm al-a'dad*) in arithmetic from translations of the Greeks sources such as Books VII through to IX of Euclid's *Elements* and the *Introduction to the Science of Numbers* by Nicomachus of Gerasa.¹⁶

14 Ibid. p.44

15 Ibid.p.24

An extraordinary mathematician Muhammad Al-Khwarizmi joined the Bayt al-Hikma in the mid ninth century, and is known as the most compelling mathematician of all circumstances. His book *Hisab al-Jabar wal Muqabala*, Calculation of Integration and Equation changed science until the end of time. Variable based math takes its name from the title of the book. It turned into a standard content in Europe for a long time. He additionally imagined calculation, a branch of science that gets its name from the place where he grew up of Khwarizm. He composed a few scientific works that were soon embraced all through the Muslim world. For quite a while European were utilizing the unwieldy Roman numbering framework. They learnt their present numbering called Arabic numerals from Muslims. The most bewildering of his discoveries is Sifr or Zero which isn't a number however its absence. It tackled numerous issues in arithmetic. At a gathering of her officials organized soon after 9/11, Carly Fiorina, CEO of Hewlett Packard properly educated them that IT innovation would not have been conceivable without these commitments. Among others, Morgan cited above likewise helps us to remember this, and other Muslim accomplishments.

Al-Khwarizmi composed the primary book of variable based math, the word 'polynomial math' transliterates into the term *aljabr*. Al-jabr speaks to the two fundamental activities utilized by al-Khwarizmi in comprehending quadratic conditions. In the last 50% of the twelfth century, the initial segment of al-Khwarizmi's Kitab *al-Jabr wa al-Muqabalah* was interpreted and made accessible in Europe.¹⁷

Chemistry, Pharmacology and Modern Sciences:

Just a hundred after the Prophet (s), Jabir ibn Hayyan started the exploration of science. He designed the greater part of the synthetic procedures which are as yet utilized as a part of science labs, for example, decontamination of substances, oxidization, sublimation, liquefaction and crystallization. He likewise presented enhanced research center hardware, for example, water showers, heaters, and frameworks for filtration and refining.

In science, crafted by Jaber ibn Haiyan and Al-Razi shaped the premise of present-day science. Jaber, known as Geber in Latin, depicted in his works the readiness of numerous synthetic substances: the sulfide of mercury, oxides and arsenic mixes. Al-Razi in his book *Secret of Insider facts* know as *Liber secretorum bubacaris*, portrayed the substance procedures and tests he led.¹⁸

In pharmacology also Muslim physicians made their lasting contributions. They not only discovered many herbal medicines but also perfected techniques of chemical extractions that are employed today. The first official pharmacy was established in Baghdad by Haur al-Rashid and by the times of al-Mamun it employed highly qualified pharmacists who were licensed and inspected by the state.

In the fields of pharmacology and drug store Muslims gained outstanding ground. These fields included logical examination concerning the piece, measurements, uses and helpful impacts of medications. Having interpretations of Dioscorides' *De Materis Medica*, alongside information from Syria, Persia, India and the Far East, Muslim researchers and doctors demonstrated extraordinary innovative skills. They developed the procedures for the manufacture of syrups and juleps, and established apothecary shops.¹⁹

16 Berggren, L.J. *Mathematical and Her Sisters in Medieval Islam: A Selective Review* done from 1985 to 1995 (New York: Historia Mathematica, 1997)

17 Kettani, 1976; Sarton, 1927

18 Hill, D. R. *Islamic Science and Engineering* (Edinburgh: Edinburgh University Press), p.83

19 Turner, R.H. *Science and Medivial Islam: An Illustrated Introduction* (Austin: University of Texas Press, 1995)

Reasons for Current Stagnation:

With all of these illustrious personalities and their admirable pioneering, the question is, what is the cause of Muslim stagnation at present.

Most to blame are authoritarian regimes that are unfortunately backed by the Western powers. Their only concern of these regimes is security and the intelligence services spying on their own people. These countries where nominal democracies exist, the corrupt elite loot the public treasury.

There is meager spending on education and negligible on research. For example, oil rich monarchies of Saudi Arabia, Kuwait and Qatar whose economies are comparable to Western nations spend only 0.2% of their GDP on science, less than a tenth of the 2.3% of the average of developed nations. Under these circumstances, the educated and others who can, leave for the advanced West for a better livelihood and provision of work facilities, causing brain drain.

Conclusion:

The above elucidation shows that, it is obligatory on every Muslim to seek knowledge. Our ascendants proved this very truth into practice and they exerted their lives to enhance their skills to juxtapose their contemporary sciences in the light of spiritual knowledge. The Muslims were the pioneers in Astronomy, Astrology, Medicines, Pharmacology, Chemistry, Physics and even those modern sciences that are accustomed today. The current scenario shows that the Muslims are decaying their pioneering status and are deteriorating day by day. The reason behind it is the lack of concentration on seeking knowledge, grasping technology, exploring the inner abilities of the talented personalities, decaying infrastructure, lack of unity, corruption, destabilized governments, exploiting system, discouraging talent and the unfair use of power are the major causes of today's deterioration of Islamic Civilization.

If the problems abovementioned are uprooted, the Islamic Civilization will reiterate its past enterprise in the contemporary world.



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