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Influence of Islam on European Renaissance

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Abstract

Golden period of Muslim Ummah (year 800-1100) is well-known to everyone. During this period, they were at the height of knowledge and research in every field. They made a lot of contribution towards social development all over the world. This was a time when entire Europe was in complete ignorance and darkness. However, from 14th century onward, when the West opened their eyes, they found a lot of knowledge and information contributed by Muslims. They got maximum benefit from it and thus made way for European Renaissance, which was a turning point in development of the West. But, unfortunately, they never acknowledged this great contribution of Muslims. This article is an attempt to highlight Muslims contribution towards social development in the field of scientific research and technological development. Without Muslims contribution, it would have never been possible for the West to come out of the ocean of ignorance and darkness. The article will help our young generation to understand the true picture of history and they will feel proud of the great foundation laid down by Muslims for social development all over the Globe. The article ends with a speech of Prince of Wales who has acknowledged this great service of Muslim Scientists.

Key-words: Muslim Ummah, social development, ignorance, history, Muslim contributions, European Renaissance (تحریکِ احیاءِ علوم).

Introduction

As a result of success of Revolutionary Movement launched by Allah's last Prophet Hadhrat Muhammad (S.A.W.), Muslim Ummah emerged as Super Power and, within a few years after his demise, Muslims were leading almost all countries of the world.

During this golden period, Muslim states were the centers of knowledge, scientific research and technological development. The period 800 to 1100 AD saw Muslim Ummah at the climax of power and victory. People came to Muslim states for

learning and research from all over the world. This period produced a large number of Muslim Scholars and Scientists of high caliber in all fields. Among them were renowned mathematicians, astronomers, astrologists, medical specialists and experts of physics, chemistry, painting, art, calligraphy and music. They made a lot of contribution towards social development and played a vital role in bringing light of knowledge to a society which was lost in a pitch of darkness.

However, it is very unfortunate that many non-Muslims would find it hard to believe that there was a time in the Middle Ages when Islamic cities in the Middle East, such as Cairo (قاہرہ), Baghdad, Cordoba (قرطبہ) and Damascus (دمشق) were the center of civilization[1], while Europe at that time was living in the "Dark Ages" and was considered to be chaotic (disordered), unorganized and backward.

That's why the period before the 1100s was called the "Dark Ages"[2] in Christian Europe as the Europeans had failed to benefit from Muslims' scientific discoveries.

How Islam influenced the European Renaissance:

When Europe was in complete darkness, we find that Muslim Spain was the state which played a vital role in the revolution of science. Cordoba, capital of Muslim Spain, was known for its scientific advancements. Scholars and students from all over the world travelled to Cordoba for research and higher studies.

The vast contrast in intellectual activity could be demonstrated by just one example. In the ninth century, the library of the monastery of St. Gall was considered to be the largest library in Europe. It had only 160,000 books.[3] But at the same time, Cordoba's library contained over 500,000 books.[4] Studying at colleges was first applied by Muslims.

Universities first appeared in Muslims countries in the late 600s and the early 700s, while leading colleges, like Oxford and the University of Paris were founded in Europe in the 13th century. Amazingly, early European universities were also funded by the Trusts similar to Islamic ones. Some historians even trace old European colleges back to the Islamic system as their internal organization was very similar to the Islamic one. For example, the idea of Graduate (صاحب) and undergraduate (مُتَفَقِّہ) is derived directly from Islamic terms. In the field of mathematics, the Arabic numerals, the

[1] Ali Ameer.
[2] Early Middle Ages
[3] Library of St. Gall
[4] Islam-awareness

number zero **(0)** and the decimal system were introduced to Europe by Muslims, helping them to solve problems in minutes instead of hours and laying the foundation for the scientific revolution.

One of the most popular Muslim mathematicians is Al-Kawarizmi **(الخوارزمی)**, whose work has been translated into Latin. Al-Kawarizmi laid the ground work for Algebra and found methods to deal with complex mathematical problems, such as square roots and complex fractions. That's probably why he was called the father of Algebra. But Al-Kawarizmi's scientific contributions go beyond Algebra. He worked in several other fields, particularly astronomy, astrology, geography and cartography (*maps*). His work included many experiments, such as measuring the height of the earth's atmosphere and discovering the principle of the magnifying lens.

Trigonometric work by Al-kirmani (Persian Muslim scholar who lived mostly in Cairo and Baghdad) about Toledo (*Northern Spain*) was translated into Latin (*from which we get the Sine and Cosine Functions*) along with the Greek knowledge of Geometry by Euclid (*father of Geometry*).

Al-Biruni **(البیرونی)**, an Iranian Muslim Expert in Geography was famous for his research about earth. "*Bīrūnī devised a novel method of determining the Earth's radius by means of the observation of the height of a mountain. He carried it out at Nandana in Pind Dadan Khan (present-day Pakistan). He used trigonometry to calculate the radius of the Earth using measurements of the height of a hill and measurement of the dip in the horizon from the top of that hill. His calculated radius for the Earth of 3928.77 miles was only 2% higher than the actual mean radius of 3847.80 miles*."[5] Look at the intelligence and accuracy of these great people.

While traveling from Islamabad to Lahore on Motorway, after crossing the hills of salt range, when you are on straight road, you see a wide plain area around you from where you can see everything at a long distance. This is the point where Biruni came for measurement of the radius of earth.

Another famous Islamic icon is Ibn-ul-Haythum **(ابن الہیثم)** whose works on Optics in which he deals with 50 optical questions put to Muslim Scholars by the Franks (*German tribes*) were translated into several languages. It was the Muslims who

[5] Al-Beruni

discovered the Principle of Pendulum,[6] which was used to measure time. In fact, many of the principles of Isaac Newton were derived from former Islamic scientific contributions.

Chemistry was also shaped by Muslim scholars, especially its branch which is called alchemy (علم الکیمیا). Jabir ibn-Hayyan (جابر بن حیّان) is one of the most popular Muslim Scientist; and many scholars link the introduction of the 'scientific method' back to him. Moreover, several terms used in Chemistry such as alcohol, alembic, alkali and elixir (الاکسیر) are of Islamic origin. Muslims' contributions to medicine could never be ignored.

Every major Islamic city in the Middle Ages had a hospital; one of the largest at that time was in Cairo, which had more than 8 thousand beds, with separate wards for fevers, ophthalmic, dysentery and surgical cases.

One of the leading Muslim doctors is Al-Raazi (رازی) who discovered the origin of smallpox and found that one could only acquire it once in one's life, thus showing the existence of the immune system and how it worked. Among his numerous minor medical treatises is the famed *Treatise on the Small Pox and Measles,* which was translated into Latin, Byzantine Greek, and various modern languages.[7] He was an early proponent (*founder*) of experimental medicine and is considered the father of pediatrics, in addition to being a pioneer in neurosurgery and ophthalmology.

George Sarton, the father of the history of science, wrote: "*Raazi was the greatest physician of Islam and the Medieval Ages*."[8]

Dimensions of Islamic Knowledge:

Islamic knowledge that was absorbed by Europe from 11th to 13th century has the following dimensions:-

1. Sciences:

The Islamic world made important advances in science, such as in algebra, chemistry, geology, spherical trigonometry (*ball like triangles*), etc. which were later on transmitted to other countries, including the West.[9] '*An Arab manual of medical theory*' was translated from Arabic to Latin. The method of algorism for

[6] Ibn Yūnus
[7] Al-Raazi
[8] Analysis of George Sarton
[9] Ali Ameer

performing arithmetic, developed by the Persian Muslim Mathematician Al-Khwarizmi in the 9th century, was introduced in Europe during 1170–1250.

Ibn-al-Haythum compiled treatises (written articles) on optical sciences (*study of Light*), which were used as references by Newton. Medical sciences were also highly developed in Islam as testified by the Crusaders, who relied on Arab doctors on numerous occasions. Arab physicians and scholars also laid the basis for medical practice in Europe.

Before the Islamic era, medical care was largely provided by priests in sanatoriums and annexes to temples. The main Arabian hospitals were centers of medical education and introduced many of the concepts and structures that we see in modern hospitals, such as separate wards for men and women, personal and institutional hygiene, medical records, and pharmacies.[10]

Islamic Spain and Sicily were particularly productive areas because of multi-lingual scholars available in their surroundings. These scholars translated many scientific and philosophical texts from Arabic into Latin.

The following sciences were introduced by Islamic World in Europe:-

a. Alchemy:

Western alchemy was directly dependent upon Arabic sources. Jābir bin Hayyān's works, including his كتاب الكيميا (*titled 'Book of the Composition of Alchemy in Europe'*) was translated by Robert of Chester (1144).[11] The alchemical works of Muhammad ibn Zakarīya Al-Rāzi were translated into Latin around 12th century.

b. Astronomy and Mathematics:

The translation of Al-Khwarizmi's work greatly influenced mathematics in Europe. The reality is that first algebra works in that continent were translations of the work of Al-Khwärizmï and other Islamic authors. Much of plane and spherical trigonometry could be attributed to Islamic authors.

The words '*algorithm*' and '*algebra*' are themselves Arabic loan-words. This and many other Arabic astronomical and mathematical works were translated into Latin during the 12th century.

Hindu Numeral System, which was based on Decimal Number System, was originally invented between the 1st and 4th centuries by Indian mathematicians. The

[10] Article of PMC

[11] ibid.

system was adopted by Persian mathematician Al-Khwarizmi and afterwards by Arab mathematician Al-Kindi (الکندی)[12].

After this it spread to medieval Europe. The first complete European account of the Hindu-Arabic numeral system was presented from Arabic sources in 1202. Al-Jayyani's *The book of unknown arcs of a sphere* (a treatise on spherical trigonometry) had a strong influence on European mathematics.

Regiomantus' *On Triangles* (1463) certainly took material on spherical trigonometry (*without acknowledgement*) from Arab sources like Jabir ibn Aflah during 12th century.

c. Medicine:

In the field of medicine, Gerard translated numerous works by Arabic scholars, such as Al-Razi and Ibn Sina (ابنِ سینا). '*London Museum*' - one of the most important medical works - was originally Ibn Sina's book '*The Canon of Medicine* (1025), which was translated from Arabic into Latin and then disseminated in manuscript & printed form throughout Europe. It remained a standard medical text book in Europe from 15th century onward until the early modern period. Its importance is evident from the fact that during 15th and 16th centuries alone, this book was published more than thirty-five times.

In this book, Ibn Sina discussed for the first time the contagious nature of some infectious diseases (*which he attributed to "traces" left in the air by a sick person*), and suggested how to effectively test new medicines. He also wrote *The Book of Healing*, a more general encyclopedia of science and philosophy, which became another popular textbook in Europe.

Al-Razi wrote the *Comprehensive Book of Medicine*, with its careful description of and distinction between measles and smallpox, which was also very influential in Europe.

Al-Zahrawi wrote *Kitab al-Tasrif*, an encyclopedia of medicine which was particularly famed for its section on surgery. It included descriptions and diagrams of over 200 surgical instruments, many of which he himself developed. The surgery section was translated into Latin by Gerard in 12th century, and used in European medical schools for centuries.

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[12] Ali Ameer

d. Physics:

Ibn-al-Haytham (*Alhazen*) wrote the *Book of Optics* (1021), in which he developed a theory of vision and light which was based on the work of the Roman writer Ptolemy. But he rejected Ptolemy's theory that light was emitted by the eye, insisting instead that light rays entered the eye. This was the most significant advance in this field. The *Book of Optics* was an important stepping stone in the history of the scientific method and history of optics. The Latin translation of the *Book of Optics* influenced the works of many later European scientists, including Roger Bacon and Johannes Kepler. The book also influenced other aspects of European culture like religion, literature and art.

The theory of motion developed by Ibn Sina influenced Buridan's theory of impetus (a force that moves something). The work of Galileo on classical mechanics was also influenced by earlier Muslim medieval physics writers, including Ibn Bajja.[13]

2. Islamic technology:

Like science, the technology developed by the Muslim scholars also left far-reaching effects on Europe. The fields in which technologies were developed by the Muslims are:

a. Agriculture and textiles:

Various fruits and vegetables were introduced to Europe via the Middle East and North Africa, some from as far as China and India. These include cabbage, spinach and aubergine **(بینگن)**.

There had been an Arab Agricultural Revolution between 700 and 1100, which had diffused a large number of crops and technologies from Spain into medieval Europe, where farming was mostly restricted to wheat.

Eighteen crops, including sorghum (*grass*) from Africa, citrus fruits from China, and numerous crops from India such as mangos, rice, cotton and sugar-cane, were distributed throughout Islamic lands which were later introduced in medieval Europe that had previously not grown them.

These introductions, along with an increased mechanization of agriculture, led to major changes in economy, population distribution, vegetation cover, agricultural

[13] Avempace

production & income, population levels, urban growth, distribution of labor force, linked industries, cooking, diet and clothing in the Islamic world and Europe. Also transmitted via Muslim influence, a silk industry flourished; flax was cultivated and linen exported. New techniques and new materials in clothing were also introduced, including muslin (ململ), taffetas, and satin (ساٹن).

b. Decorative Arts:

Islamic decorative arts were highly valued imports to Europe throughout the Middle Ages. Most surviving examples are those that were in the possession of the church. In the early period, textiles used for church were especially important.

Islamic pottery of everyday quality was still preferred to European wares. Because decoration was mostly ornamental, or small hunting scenes and the like, and inscriptions were not understood, Islamic objects did not offend Christian sensibilities.

Medieval art in Sicily is interesting stylistically because of the mixture of Norman, Arab and Byzantine influences in areas such as mosaics and metal in-lays, sculpture and bronze-working.

c. Writing:

Islamic influences on Western art are quite visible in Pseudo-Kufic script. The Arabic Kufic script was often imitated for decorative effect in the West during the Middle Ages and the Renaissance, to produce what is known as pseudo-Kufic.

Numerous cases of pseudo-Kufic are known from European art from around the 10th to the 15th century; usually the characters are meaningless, though sometimes a text has been copied.

Pseudo-Kufic would be used as writing or as decorative elements in textiles and religious frames. Many are visible in the paintings of Giotto. Pseudo-Kufic scripts became popular in Europe mainly because it appeared as being identical with the scripts current during Hadhrat Issa's time, and thus it was associated with early Christians.

d. Islamic carpets:

The Somerset House Conference (1604) shows English and Spanish diplomats gathered around a table covered by an Oriental carpet. Islamic carpets of Middle-Eastern origin were a significant sign of wealth and luxury in Europe, as demonstrated by their frequent occurrence as important decorative features in paintings from 13th century onward. Such carpets, together with Pseudo-Kufic script offer an interesting

example of the integration of Eastern elements into European painting, most particularly those depicting religious subjects.

e. Music:

A number of musical instruments used in European music were influenced by Arabic musical instruments**,** including violin, guitar, naker **(نقّارہ)**, and lute (sitar) etc.

Biased Attitude of Europe:

It is quite evident that from 11th to 13th century, medieval Europe absorbed maximum knowledge from Islamic civilization, which was at its cultural peak during this period. Of particular importance was the re-discovery of some ancient classic texts, most notably the works of the Greek writers, which were re-translated from Arabic. Thus all the Islamic discoveries were used by the Europeans as the raw material for the Scientific Revolution. But in spite of all this, it is very tragic to note how Muslim's contributions go un-acknowledged by Europe, whose renaissance couldn't have occurred without the Islamic discoveries.

This shows generally a very biased attitude and intellectual dishonesty of the West towards Muslims vital role in European Renaissance, with only a few exceptions, one of which is a speech by Prince of Wales who really acknowledged Muslims contribution from the core of his heart.

This speech needs to be written in golden words:

Speech by Prince of Wales on 'Islam's Contribution to Europe's Renaissance;

Role of Muslim scholars in bringing light of knowledge and progress to Europe always goes un-acknowledged. However, it is surprising - and very encouraging - to note that in 1990s HRH, The Prince of Wales, Charles Philip Arthur not only admitted this fact but also paid tribute to the Muslim scholars for their great contribution in bringing Europe out of Dark Ages. In 1993 at the Oxford Centre for Islamic Studies, he spoke about how the West can learn and benefit from the legacy of Muslims in Andalusia. He said:-

"*We have underestimated the importance of 800 years of Islamic society and culture in Spain between the 8th and 15th centuries. The contribution of Muslim Spain to the preservation of classical learning during the Dark Ages (of Europe), and to the first flowerings of the Renaissance, has long been recognized. But Islamic Spain was much more than a mere larder (food store) where Hellenistic*

(Classical Greek) knowledge was kept for later consumption by the emerging modern Western world.

The fact is that not only did Muslim Spain gather and preserve the intellectual content of ancient Greek and Roman civilization, it also interpreted and expanded upon that civilization, and made a vital contribution of its own in so many fields of human endeavor - in science, astronomy, mathematics, algebra (itself an Arabic word), law, history, medicine, pharmacology, optics, agriculture, architecture, theology, music etc. Averroes (ibn Rushd – a Muslim Philosopher) and Avenzoar (Ibn Zuhr - a Muslim Arab physician & surgeon and poet), like their counterparts Avicenna (Ibn Sina) and Rhazes (Raazi) in the East, contributed to the study and practice of medicine in ways from which Europe benefited for centuries afterwards.

Islam nurtured and preserved the quest for learning. In the words of the tradition, 'the ink of the scholar is more sacred than the blood of the martyr'. Cordoba **(قرطبہ)** *in the 10th century was by far the most civilized city of Europe. Everyone knows of lending libraries in Spain at the time King Alfred was busy in promoting the culinary (cooking) arts in this country. It is said that the 400,000 volumes in one library of Spain amounted to more books than all the libraries of the rest of Europe put together. That was made possible because the Muslim world acquired from China the skill of making paper more than 400 years before the rest of non-Muslim Europe. Many of the traits on which modern Europe prides itself came to it from Muslim Spain. Diplomacy, free trade, open borders, the techniques of academic research, of anthropology, etiquette, fashion, various types of medicine, hospitals, all came from this great city of cities.*

The beauty of Islam is that it is a religion of remarkable tolerance which allows the minorities (Jews and Christians) the right to practice their inherited beliefs. Thus Islam has set an example which was not, unfortunately, copied for many centuries in the West. The surprise is the extent to which Islam has been a part of Europe for so long, first in Spain, then in the Balkans (eastern Europe), and the extent to which it has contributed so much towards the civilization which we all too often think of, wrongly, as entirely Western. Islam is part of our past and our present, in all fields of human endeavor. It has helped to create modern Europe. It is part of our own inheritance, not a thing apart."[14]

[14] Islam and Muslims

Way Forward

It is the duty of young generation especially those who are Muslims to study the history of their ancestors in order to have correct and authentic picture of their past. They should tell the world that whatever progress they see in modern scientific development, its foundation was actually laid by early Muslim Scientists and Philosophers and the entire humanity owes to them for this great contribution and service.

REFERENCES

1) Ali Ameer, The Spirit of Islam, Chapter IX, p. 338. (For a description of Bagdad under the Abbasids, see Short History of the Saracens by the same Author (Macmillan) p. 444
2) https://en.wikipedia.org/wiki/Early_Middle_Ages
3) https://en.wikipedia.org/wiki/Abbey_library_of_Saint_Gall
4) https://www.islamawareness.net/Science/science_influence.html
5) https://en.wikipedia.org/wiki/Al-Biruni
6) "Enough glory to Ibn Yūnus (ابنِ یونس) that it was he who invented the pendulum and thus preceded Glileo in this invention by six centuries (*Tuqan*, p. 275).
7) https://www.britannica.com/biography/al-Razi
8) https://www.kibin.com/essay-examples/an-analysis-of-the-well-known-writer-george-sarton-rhu5SLIM
9) Ali Ameer, The Spirit of Islam, Chapter IX, p. 331-419.
10) https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1322233/
11) Ibid.
12) Ali Ameer, The Spirit of Islam, Chapter IX, p. 344.
13) https://en.wikipedia.org/wiki/Avempace
14) https://thecognate.com/king-charles-iii-and-his-views-on-islam-and-muslims/