

Contribution of Muslim Scholars towards Modern Science

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Abstract

Islam has its own golden history in every field of knowledge. The first message of Allah to our beloved Prophet (PBUH) was the word IQRA which means to read, i.e. emphasis on pursuing knowledge. Muslim scholars from the past were very much aware of this instruction given by Allah and they were very much captivated onto that. They developed many ideas and theories in varied fields of knowledge including science. Islam has patronized and fostered the Greek scientific heritage in the field of medicine, astronomy, mathematics, physics, chemistry and philosophy. Islam continued to add new scientific achievements which bear witness that Muslims were deeply and seriously interested in scientific research. This paper presents a discussion regarding the role that Muslim scholars played in the development of scientific thinking. It argues that the Muslims were not just the preservers of the ancient and Greek knowledge, but that they contributed original works to the different fields of science. They were inspired by the Islamic view of nature that is; mankind had a duty to 'study nature in order to discover God and to use nature for the benefit of mankind. This paper will also promote Islamization of knowledge and its necessity for solving current Muslim world's educational problems. It is also hoped that, by remembering all those Muslim heroes and their contributions, contemporary Muslim societies and budding Muslim scholars will be inspired and encouraged.

Key words: Muslim Scholars, Scientific thinking, Astronomy, Scientific Research, Iqra.

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Introduction:

One big misconception among the non-Muslim Communities about Islam is the fact that they consider Religion of Islam is just 1400 years old and the Prophet Muhammad ^{SAW} as the founder of this great religion but the fact is that this Religion of Islam is as old as the human life on Earth and almighty Allah has sent nearly 1,24,000 Messengers on earth to propagate and spread this natural Religion of Islam. To the Muslims, history is a chain of incidents that inform the time and values of Islam. It is more concentrated in knowing and “realizing” these ideologies than in nurturing uniqueness and change as essential virtues. The symbol of Islamic Civilization is not a rolling river, but the dice of the Kaaba, the firmness of which represents the everlasting and incontrovertible character of Islam.

The Islamic world created the greatest legacy of scientific knowledge seen in history to that date. The sciences of medicine, geometry, algebra, astronomy and even sociology were developed systematically for the first time. Great Centres of Religious Learning were also the centres of knowledge and scientific development. Such formal centres began during the Abbasid period (750-1258 A.D) when thousands of mosque schools were established. In the 10th century Bagdad had some 300 schools. Alexandria in the 14th century had almost 12,000 students. It was in the 10th century that the formal concept of the Madrassah (School) was developed in Bagdad. The Madrassah had the full-time and the part-time teachers, many of whom were women. Rich and poor alike received free education. From there Maktabat (Libraries) were developed and the books from different countries were acquired. The two most famous libraries are the Bait Al-Hikmah in Bagdad (ca. 820) and Dar al-ilm in Cairo (ca. 988) and the Universities such as Al-Azhar (968 AD) were also established long before those in Europe. The Islamic world created the Universities and even hospitals in the world. The story of Islamic movement to science and technology and the entrepreneurship is a remarkable saga of new sightings in pure and applied science, technological advancement and entrepreneurship that establish the spirited and essential base of modern science, technology and business arrangements. The story of the Muslim sciences takes the form of captivation of knowledge from different civilizations, accumulating their original and significant contributions and increasing knowledge across the countries and regions trade, cultural interactions and education.

It is a well-established fact that the Muslims were not just the preservers of the ancient and Greek Knowledge, but that they contributed original works to the different fields of science. They were inspired by the Islamic view of nature that is, mankind had a duty to ‘study nature in order to discover God and to use nature for the benefit of mankind. There are hundreds of Muslim Scholars who have proved to be the great scientists of all times but some people with vested interests have deliberately concealed the identities. That is why today some people are of the opinion that Muslims had played very little role in modern scientific revolutions. The need of the hour is that Muslims should come to the forefront not only in highlighting the already work done by Muslim Scholars in the field of science but at the same time prepare great scholars who could work in this field at par with the scientists of other religious thoughts.

Review of the related Literature:

Many studies have been done on Contribution of Muslims towards Science by the individual scholars, religious organizations; NGO's as well as by some governmental agencies; the findings of some important studies are mentioned here:

Prof WahabQasar has written a detailed account on the contribution of some Muslim Scholars in the field of science and technology in his book "*Maulana Azad kiScienceseBaseerat* " 2004. Though the author has tried his best to include many scholars in his work but has not succeeded in mentioning their specific contribution at large.

Contributions of Islamic Scholars at the scientific Enterprise by Yasmeen MehnazFaruqi(*International Educational Journal*, 2006, 7(4), 391-399). This paper presents a discussion regarding the role that Muslim Scholars played in the development of scientific thinking in the middle ages. Though the author has written a comprehensive paper but there is room for further development and investigation in it.

There are many misconceptions surrounding the contribution of Muslims in the modern Science and Technology but the picture is different as the large number of Muslim Scholars have done remarkable job in the field of knowledge and have made the community to feel proud of them. Dr Muhammad Adil Afridi has worked out the contribution of some Muslim Scientists in the field of Mathematics, Physics and Medicine in his paper, "*CONTRIBUTION OF MUSLIM SCIENTISTS TO THE WORLD: an overview of some Selected Fields*". (2011). However the paper has been limited to three branches of science only.

A. Aslam has also tried his best to explore the remarkable work done by some great Islamic Scholars in the field of Astronomy, Chemistry, Botany, Medicine and Historiography in his paper "Muslim Contribution to Science" 2011. The paper includes some important fields of science but there are many more branches where Muslims have made their mark that too is to be considered at the top priority.

Muslim Scholars and Modern Science:

Many Muslim Scholars in the golden age of Islam studied nature in the context of the Quran. The Quran depicted the relationship between the nature and the man and this inspired the Muslim Scholars to study the phenomenon, in order to understand God. Islam's contribution to the scientific enterprise was complex and rich and primarily it spanned over three continents and slowly cleared nearly all the barriers of time and space. Here we will discuss some of the fields of Science where Muslim Scholars have contributed to the maximum.

Mathematics:

Mathematics is the mother of all sciences and it owes a lot to the Muslim community and a number of basic fundamentals of mathematics were discovered by the Muslim Scientists. Muslims derived their theory of numbers (*ilm al-a-dad*) in arithmetic from the translations of the Greek sources such as Books VII through to IX of Euclid's Elements and the Introduction to the Science of Numbers by *Nicomachus of Gerasa* (Berggren, 1977). Moreover, they acquired numerals from India (Hindu) and possibly China and made their use widespread. *Mohammad Bin Ahmed* in the 10th century invented the concept of Zero or Sifr. Thus replacing the cumbersome

Roman numerals and creating a revolution in mathematics (Badawi, 2002). This led to the advances in the prediction of the movement of the planets and the advances in the field of astronomy and geography. Muslim mathematicians had inherited both Babylonian's Sexagesimal System and the Indian (Hindu) Decimal System. This provided the basis for numerical techniques in mathematics (Folkerts, 2001; Rajagopal, 1993). Muslims built mathematical models using the decimal system, expressing all numbers by means of ten symbols. Each symbol was accorded the value of position as well as the absolute value (Kettani, 1976.). Many creative methods of doing multiplications were developed by Muslims; Methods of checking by casting out nines and decimal fractions (Anawati, 1976). Thus the Muslim Scholars contributed and laid down the foundations of modern mathematics and the use of mathematics in the field of sciences and engineering (Hoyrup, 1987).

Chemical Sciences:

In chemistry, the works of *Jaber-ibn-Haiyan* and *Al-Razi* formed the basis of modern Science. Jabir's major contribution was in the field of chemistry. He introduced experimental investigation into alchemy which rapidly changed its character into modern chemistry. The ruins of his well-known laboratory remained for centuries but his fame rests on over 100 monumental treatises, of which 22 relate to chemistry and alchemy. His contribution of fundamental importance to chemistry includes perfection of scientific techniques such as crystallization, distillation, calcinations, sublimation and evaporation and development of several instruments for the same. The fact of early development of chemistry as a distinct branch of science by the Arabs, instead of the earlier vague ideas, is well established and the very name chemistry is derived from the Arabic word *Al-Kimya*, which was studied and developed extensively by the Muslim Scientists. The initial ladder to the modern western chemistry of the 18th century was produced by *Jabir*. It is believed that *Jabir wrote about 2000* books on different sciences. These many scholarly books had never been written by Muslim epoch by any single writer.

Physical Sciences:

Muslim Scientists excelled in physics in an unprecedentedly subtle and intelligent fashion to the extent that they seemed to establish a new science. For example they made Physics rely on experimentation and induction rather than on philosophy, speculations or mere thoughts. They studied acoustics, its origin and its transfer. They were the first to understand that the sounds are affected by the bodies that cause them and these sounds transfer in the air in the form of circular waves. They were also the first to categorize sounds into different types; they expounded that the sounds of animals differ according to the lengths of their necks, the width of their throats and the structure of their larynx. The astronomer who is said to have studied the solar system and presented the heliocentric theory for the first time was a Greek, known by the name of *Aristarchus of Samos* who died in 270 BC.

Biological Sciences:

Abu Ali IbnSina (980-1037), better recognized to the west as Avicenna, was conceivably the utmost physician until the contemporary epoch. His renowned book, *Al-Qanun fit-al-Tibb*, stayed a typical textbook even in Europe, for more than 700 Years. Ibn-Sina's efforts are still considered and assembled upon the east. *Ibn-Sina* alone wrote about 246 books, together with *Kitab-Al-Shifa* (The Book of Healing) containing 20 volumes and *Al-Qanun fit-tibb*, (The

Canons of Medicine). The *Qanun* was the principal guide for medical science in the west from the 12th century to the 17th century. Dr. William Osler, who wrote *The Evolution of Modern Science*, remarked “The Qanun has remained a medical Bible for a longer period than any other work”. Comprising over a million words, it graphed the entire medical facts available from ancient and Modern sources together with his innovative assistances. Ibn-Sina’s creative influences involved such developments such as acknowledgements of the communicable nature of tuberculosis; Spreading of diseases by water and soil and the collaboration between psychology and health. Also, the book defined over 760 medicines and became the most authentic of its era. Ibn-Sina was also the first to describe meningitis and prepared ionic contributions to anatomy, gynecology and child health.

Abu Bakr Muhammad ibn Zakariya al-Razi (865-925 AD), identified as Rhazes, was one of the greatest inexhaustible Muslim doctors and perhaps second only to Ibn Sina in his endeavours. He was born at Ray, Iran and became a student of Hunayn Ibn Sina and later student of Ali Ibn Rabban. He penned over 200 books, including *Kitab al Mansuri*, ten volumes on Greek medicine, and *Al-Hawi*, compendium of medicine in 20 volumes. It was the first encyclopedia of all medical science up to that time and had to be completed by his disciples after his death. The Arabs thus made extraordinary advances in medicine through their research.

In the fields of pharmacology and pharmacy Muslims made a notable progress. These fields involved scientific investigation into the composition and dosages, uses and therapeutic effects of drugs. Having translations of Dioscorides’ *de Materis Medica*, along with the knowledge from Syria, Persia, India and the far East, Muslim Scholars and physicians showed great innovative skills. They developed the procedures for the manufacture of syrups and the juleps and established apothecary shops (Turner, 1995). Ibn Al-Baytar’s book *Al-Jami ‘fi al taib* (*Collection of Simple Diets and Drugs*) contained detailed records of the plants in the lands along the length of the Mediterranean coast between Spain and Syria. In addition he systematically compared this knowledge with that of the scientists of previous eras. His book on botany was used until the Renaissance by the Europeans.

Conclusion:

There is hardly any field of Knowledge where in Muslims have not made their full contribution and it is a well known fact that in some fields of knowledge The Muslim Scholars had taken a lead role. The science of music and fine arts is the leading example; the legends of Indian music even today are none other than Muslims. Contributions of the Muslims to Science, technology and entrepreneurship from the 8th to 16th century is a noteworthy expansion in human antiquity. The Muslim Scholars not only conserved the ancient knowledge but also transformed it into major new contributions to the basic science and technology. The basic contributions were in the field such as; Physical sciences including Astronomy, Chemical Sciences including Mathematics and Biological sciences including Medicine and pharmacology which constitute the basis of the modern Science and technologies. Also they provided connectivity between Arab and other parts of the world like the Far East, Middle East and the European regions by distributing knowledge. The wisdom of the Quran first enlightened the Islamic world and then shed light to one and all. If something went wrong in the Islamic world this was because Muslims turned away from sincerity, wisdom and open-mindedness that Allah teaches the mankind through Quran.

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