

The Prominence of Science in Islam

Ibrahim N. Hassan, Mohd Yusof Hj Othman and Abdul Latif Samian
Institute of Islam Hadhari, National University of Malaysia, 43600 Bangi, Selangor, Malaysia

Abstract: Science and religion were seen separated apart and thus, sciences were kicked against by religious leaders. Then, Islam came to bridge this gap between science and religion only to be later “stolen” by the Western world after the crusades and so, sciences then were rewritten from a only materialist point of view, later, experts in modern science have put down the religion to the lowest level and became looked down at any knowledge that could not be proven scientifically. Unfortunately, again there is a gap now between understanding nature which is science and understanding God, that is, religious knowledge and also the knowledge by which man become able to appropriately understand his social responsibilities. This study presents a new concept for the science from the viewpoint of Islam and reveals the main aim behind studying science by Muslims to prove that development in religion needs to develop science and technology.

Key words: Islamic science, religion, modern science, understanding nature, understanding God, technology

INTRODUCTION

Science and knowledge were mentioned in more than 800 verses in the Muslim’s Holy book Al-Quran (Ali, 1989). Yet, Muslims today do not even realize that their fore fathers were the actual founders of modern sciences (Robinson, 1996). The living testimony to the original and revolutionary work of the Muslims itself is the use of common Arabic words used in the English language today, like Chemistry, cotton, algebra, alcohol, earth, alembic and alkaline (William, 1988). However, there are attempts being made by Muslim reformers to reconcile science and religion (Othman, 2016). These attempts are not without shortcomings, hence, the need for the Islamization of science supports the Islamic principle of unity of knowledge (Adebayo, 2015). The impact of Muslim scientists in Europe, especially on their scientific revival is not limited to one or two sciences but in numerous disciplines like Chemistry, Philosophy, Astronomy, Physics, Medicine, Geography, Optics, Mathematics, Literature and Technology they presented their ability to the West (Hassani, 2007) (Fig. 1).

Who transferred sciences from Greece? Era or period of time that separates our present day and between Greece is the period of the rise of Muslims civilization and its spread into the world. It is the period in which Muslims rule a large part of the world whether in the Middle East, North Africa, South East Asia or the Indian subcontinent (George, 1998). Muslims have not only transferred the Greeks sciences honestly and sincerity but rather they



Fig. 1: Alembic; Distillation apparatus from 8th century Arabic treaties on Chemistry. The 1001 inventions Muslim heritage in our world, 2007 by Salim T. S. Al-Hassani. London, UK. Foundation for Science Technology and Civilization (FSTC)

and developed them so that science has reached us today (Robinson, 1996). This shows that Muslims are interested in science and were using them for the benefit of mankind. This is what was ordered by the religion of Islam from the deployment of justice, equality and cooperation between the people and helping the needy.

Sciences in Islam were flourished during the medieval era long before the beginning of science in the West (George, 1998) where Islam is the only religion that values

science and scientists (Othman, 2015). Quran, for Muslims is the main source of all sciences. Allah SWT says in Al-Isra (17), verse 12 in the following meaning: “all things have we (Allah) explained in detail”. Religion was the main motive for scientific research that has been used by Muslim scholars of science as a tool for use in the practice of various life activities as well as to the performance of worship to God as Allah SWT mentioned in verses 27 and 28 in Surah Faathir (35) which means: “Seest thou not that Allah sends down rain from the sky? With it we (Allah) then bring out produce of various colours. And in the mountains are tracts white and red of various shades of colour and black intense in hue. And so amongst men and crawling creatures and cattle are they of various colours. Those who truly fear Allah, among his servants who have knowledge: for Allah is exalted in might, oft-forgiving” (Faathir (35): 27 and 28). Hence, the first to establish the scientific methods that Western scholars are Muslim scholars (Watt, 1972).

The golden age: The “Golden Age” was based on Muslim’s following the guidelines of the Prophet (PBUH) to study and search for knowledge (11 and 12). Muslims were highly encouraged to observe nature as Allah SWT mentioned in the following meaning: “Behold! In the creations of the heavens and the earth and the alternation of night and day there are indeed signs for men of understanding, men who celebrate the praises of Allah standing, sitting and lying down on their sides and contemplate the (wonders of) creation in the heavens and the earth (with the thought): “Our Lord! Not for naught hast thou created (all) this! Glory to Thee! Give us salvation from the penalty of the Fire!” Ali-Imran (3): 190-191. Moreover, the Prophet promoted medical research preaching that “For every disease, Allah has given a cure” (12).

Muslim scholars started travelling to study, teach or share ideas as communication became easier because the

Muslim Empire united extensive geographic areas. Furthermore, the Arabic language became a unifying factor (Haddad, 1993). Translations from Greek, Latin and Chinese into Arabic were uncountable thus removing language barriers for scholars. During the same period, Arabs learned from the Chinese how to produce paper and hence, books became more available. Libraries were established in Baghdad, Aleppo, Cairo, central Asia and Spain while book shops with thousands of titles opened in several cities (Haddad, 1993). Lastly, the House of Wisdom an academic institution serving as a university was established in Baghdad in 1004 C.E.

MUSLIMS USE SCIENCE AS A TOOL

The sun and the moon are important in the daily life of Muslims. The purpose of the study of astronomy and the discovery of the Astrolabe was to determine the beginning and the end of the months by the moon and to determine the time for fasting as well as time for prayer by the Sun (Katz and Imhausen, 2007). Moreover, by astronomy, Muslims can determine the exact direction of the Qiblah to face the Ka’bah in Makkah, during prayer (Fig. 2).

As shown in Fig. 2, a Qiblah compass is a modified compass used by Muslims to indicate the direction to face to perform ritual prayers. In Islam, this direction is called Qibla and points towards the city of Mecca and specifically to the Ka’bah. While the compass, like any other compass, points North, the direction of prayer is indicated by marks on the perimeter of the dial, corresponding to different cities. To determine the proper direction, one has to know with some precision both the longitude and latitude of one’s own location and those of Mecca, the city toward which one must face. The outermost circle along the rim is divided into 72 sectors that give the names of cities and regions in the Islamic world, all written in black with the exception of



Fig. 2: Sundial, compass and Qibla indicator by Bayram Ibn Ilyas 1582-1583. British Museum, London. <http://www.britishmuseum.org>

Qustantinia (Istanbul) which is written in red. Each sector contains at least two, often more names, separated from each other by gold dots. Presumably, one finds the city one wants and determines the direction of Mecca from the markings around the compass (Kurt Buzard, 2013).

Another example, the purpose of the study types of toxins is to be avoided and thus having the preservation of life. Likewise, the purpose of the textile industry is to provide clothing for men other than silk or linen where they were forbidden to men in Islam. On the other hand, the purpose behind the industry of the oily perfume in addition to appear in nice smell among the people is to avoid alcohols which are forbidden in Islam. For Muslims there is a big need to study the science. Therefore, in Islam cannot separate science and worship from each other. Science in Islam is a tool to achieve worship and a decent life for a person.

Islam and science have never been separate. The holy Quran and the Sunnah have always given a big boost to study the physical world and the laws that govern it. Hence, discoveries and inventions were the hallmarks of the Islamic civilization. On the other hand, the West considered as the study of science as some kind of arts which is just a passion or love of knowledge and reconnaissance but increased it to that and they have developed a killing and destruction machines that are harmful to human (Watt, 1972).

MUSLIM CONTRIBUTED IN ALL SCIENCES

Astronomy: The Quran contains many references to astronomy: “And it is He who created the night and the day and the Sun and the moon all [heavenly bodies] in an orbit are swimming” [Quran 21:33]. These references and the injunctions to learn, inspired the early Muslim scholars to study the heavens. They integrated the earlier works of the Indians, Persians and Greeks into a new synthesis. Muslim astronomers were the first to establish observatories, like the one built at Mugharah by Hulagu, the son of Genghis Khan in Persia and they invented instruments such as the quadrant and astrolabe which led to advances not only in astronomy but in oceanic navigation, contributing to the European age of exploration (Samian, 1991).

Geography: Muslim scholars paid great attention to geography. In fact, the Muslim’s great concern for geography originated with their religion. The Quran encourages people to travel throughout the earth to see God’s signs and patterns everywhere. Islam also requires each Muslim to have at least enough knowledge of geography to know the direction of the Qiblah (the position of the Ka’bah in Makkah) in order to pray 5 times a day.

Muslims were also used to taking long journeys to conduct trade as well as to make the Hajj and to spread their religion. The far-flung Islamic empire enabled scholar-explorers to compile large amounts of geographical and climatic information from the atlantic to the pacific.

Among the most famous names in the field of geography, even in the West are Ibn Khaldun and Ibn Batuta, renowned for their written accounts of their extensive explorations. In 1166, Al-Idrisi, the well-known Muslim scholar who served the sicilian court, produced very accurate maps, including a world map with all the continents and their mountains, rivers and famous cities. Al-Muqdishhi was the first geographer to produce accurate maps in color.

Spain was ruled by Muslims under the banner of Islam for over 700 years. By the 15th century of the Gregorian calendar the ruler ship of Islam had been seated in Spain and Muslims had established centers of learning which commanded respect all over the known world at that time. There were no “Dark Ages” such the rest of Europe experienced for the Muslims in Spain and those who lived there with them. In January of 1492 Muslim Spain capitulated to Catholic Rome under King Ferdinand and Queen Isabella. By July of the same year, Muslims were instrumental in helping navigate Christopher Columbus to the Caribbean South of Florida.

Humanity: Seeking knowledge is obligatory in Islam for every Muslim, man and woman. The main sources of Islam, the Quran and the Sunnah (Prophet Muhammad’s traditions), encourage Muslims to seek knowledge and be scholars, since, this is the best way for people to know Allah (God), to appreciate His wondrous creations and be thankful for them.

Muslims have always been eager to seek knowledge, both religious and secular and within a few years of Muhammad’s mission, a great civilization sprang up and flourished. The outcome is shown in the spread of Islamic universities; Al-Zaytunah in Tunis and Al-Azhar in Cairo go back more than 1,000 years and are the oldest existing universities in the world. Indeed, they were the models for the first European universities such as Bologna, Heidelberg and the Sorbonne. Even the familiar academic cap and gown originated at Al-Azhar University.

Muslims made great advances in many different fields such as Geography, Physics, Chemistry, Mathematics, Medicine, Pharmacology, Architecture, Linguistics and Astronomy. Algebra and the Arabic numerals were introduced to the world by Muslim scholars. The astrolabe, the quadrant and other navigational devices and maps were developed by Muslim scholars and played an important role in world progress, most notably in Europe’s age of exploration.

Muslim scholars studied the ancient civilizations from Greece and Rome to China and India. The works of Aristotle, Ptolemy, Euclid and others were translated into Arabic. Muslim scholars and scientists then added their own creative ideas, discoveries and inventions and finally transmitted this new knowledge to Europe, leading directly to the Renaissance. Many scientific and medical treatises having been translated into Latin were standard text and reference books as late as the 17th and 18th centuries.

Mathematics: Muslim mathematicians excelled in geometry as can be seen in their graphic arts and it was the great Al-Biruni (who excelled also in the fields of natural history, even geology and mineralogy) who established trigonometry as a distinct branch of mathematics. Other Muslim mathematicians made significant progress in number theory.

It is interesting to note that Islam so strongly urges mankind to study and explore the universe. For example, the Noble Quran states: “We (Allah) will show you (mankind) our signs/patterns in the horizons/universe and in yourselves until you are convinced that the revelation is the truth” [Noble Quran 41:53].

This invitation to explore and search made Muslims interested in Astronomy, Mathematics, Chemistry and the other Sciences and they had a very clear and firm understanding of the correspondences among Geometry, Mathematics and Astronomy.

The Muslims invented the symbol for zero (The word “cipher” comes from Arabic sifr) and they organized the numbers into the decimal system base 10. Additionally they invented the symbol to express an unknown quantity, i.e., variables like x .

The first great Muslim mathematician, Al-Khawarizmi, invented the subject of algebra (al-Jabr) which was further developed by others, most notably Umar Khayyam. Al-Khawarizmi’s work in Latin translation, brought the Arabic numerals along with the mathematics to Europe, through Spain. The word “algorithm” is derived from his name.

Medicine: In Islam, the human body is a source of appreciation as it is created by Almighty Allah (God). How it functions, how to keep it clean and safe how to prevent diseases from attacking it or cure those diseases have been important issues for Muslims.

Ibn Sina (d. 1037), better known to the West as Avicenna was perhaps the greatest physician until the modern era. His famous book, *Al-Qanun fi al-Tibb*, remained a standard textbook even in Europe for over 700 years. Ibn Sina’s research is still studied and built upon in the East.

Prophet Muhammad PBUH himself urged people to “take medicines for your diseases” as people at that time were reluctant to do so. He also said, “God created no illness, except that He has established for it a cure, except for old age. When the antidote is applied, the patient will recover with the permission of God”.

Since, the religion did not forbid it, Muslim scholars used human cadavers to study Anatomy and Physiology and to help their students understand how the body functions. This empirical study enabled surgery to develop very quickly.

Al-Razi, known in the West as Rhazes, the famous physician and scientist (d. 932) was one of the greatest physicians in the world in the middle ages. He stressed empirical observation and clinical medicine and was unrivalled as a diagnostician. He also wrote a treatise on hygiene in hospitals. Abul-Qasim Az-Zahrawi was a very famous surgeon in the eleventh century, known in Europe for his research, *Concession (Kitab al-Tasrif)*.

Other significant contributions were made in pharmacology such as Ibn Sina’s *Kitab al-Shifa (Book of Healing)* and in public health. Every major city in the Islamic world had a number of excellent hospitals, some of them teaching hospitals and many of them were specialized for particular diseases, including mental and emotional. The Ottomans were particularly noted for their building of hospitals and for the high level of hygiene practiced in them.

CONCLUSION

Human beings need to develop Science and Technology and hence, it will develop the Economy and success to their countries. However, when the development of Science and technology ignore religion and culture it would surely drive peoples to which direction those development will take. We will be blinded if, we develop Science and Technology without religion due to develop the system of life based on scientific achievement but ignoring responsibility to God. Equally, development in religion needs to develop Science and Technology. If man fails to understand properly this world there is no point of man being the caliph or vicegerent of Allah SWT entrusted with governing and administering it. Hence, if we do not know how to make appropriate clothing, it is impossible to make clothing to cover our privacy as commanded by religion. Otherwise, How would man properly govern and administer the world if he is ignorant about it. If we do not master science and technology, it is impossible to achieve our responsibility of putting into practice the beliefs of Islam.

Hence, without Science and Technology religion will be lame. Therefore, in Islam cannot separate Science and worship from each other. Science in Islam is a tool to achieve worship and a decent life for a person. However, the Western civilizations study Science for the sake of knowledge only.

ACKNOWLEDGEMENT

The researchers would like to record their appreciation to Institut Islam Hadhari and Universiti Kebangsaan Malaysia for granting the research fund under Research Grant STEM-2014-04.

REFERENCES

- Adebayo, R.I., 2015. From Islamicizing the sciences to strategizing for Muslims scientific breakthrough. *Intl. J. Islamic Thought*, 7: 25-38.
- Ali, A.Y., 1989. *The Meaning of the Holy Quran*. Aman Corporation, Newton, Iowa.
- George, L.S., 1998. *The Golden Age of Islam, 1998: From the Last Years of the Eighth Century to the Thirteenth Century*. Cavendish Square Publishing, New York, USA.
- Haddad, F.S., 1993. Arab contribution to medicine. *Bull. Soc. Liban Hist. Med.*, 1: 21-33.
- Hassani, S.T.S.A., 2007. *1001 Inventions-Muslim heritage in our world*. Foundation for Science, Technology and Civilization (FSTC), London, UK.
- Katz, V.J. and A. Imhausen, 2007. *The Mathematics of Egypt, Mesopotamia, China, India and Islam: A Sourcebook*. Princeton University Press, Princeton, New Jersey, ISBN-13:978-0-691-11485-9, Pages: 691.
- Kurt Buzard, 2013. *Arabian astrolabes, clocks and sundials*, British museum. *Travel to Eat*, British. <https://traveltoeat.com/arabian-astrolabes-clocks-and-sundials-british-museum/>.
- Othman, M.Y.H., 2015. Appreciation of science in Al-Quran. *Acad. J. Interdiscip. Stud.*, 4: 89-96.
- Othman, M.Y.H., 2016. [Introduction to Tawhidik Science]. Dewan Bahasa dan Pustaka Publisher, Kuala Lumpur, Malaysia, (In Malay).
- Robinson, F., 1996. *The Cambridge Illustrated History of the Islamic World*. Cambridge University Press, Cambridge, England, ISBN:0-521-66993-6, Pages: 250.
- Samian, A.L., 1991. An analysis of the growth and decline of Islamic astronomy. *Islamic Culture*, 65: 34-62.
- Watt, M., 1972. *The Influence of Islam*. Edinburg University Press, Edinburg, Texas.
- William C., 1988. *Chambers's Encyclopaedia: A Dictionary of Universal Knowledge*. W. & R. Chambers, Edinburgh's, Scotland.