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Islamic view of nature and values: Could these be the answer to building bridges between modern science and Islamic science

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This paper discusses the baics tenets of Islam and the Islamic view of nature that were influential in the development of science in the so-called 'Golden Age of Islam'. These findings have been the catalyst for present day Muslim scholars, who have emphasized the importance of Islamic science, as the means of understanding Western science. There is also a strong body of opinion within researchers of Islamic science that the abandonment of Islamic values and the rapid adoption of Western science and technologies have led to conflict in social, educational and scientific fields in Islamic countries. The article examines how these two views can be reconciled in order to build bridges between modern science and Islamic science.

Islamic science, tenets of Islam, Islamic values, modern science, view of nature

INTRODUCTION

Contemporary Muslim and non-Muslim scholars have recognized that scientific knowledge is not necessarily neutral and objective, but instead carries values and concepts that are explicit to modern Western culture (Rehman, 2003). Therefore this has resulted in a concerted effort by contemporary Islamic scholars to call for an 'Islamic science' or the 'Islamization of knowledge' (Golshani, 2000b; Davies, 1991; Ravetz, 1991). Islamic scholars have also been calling for an investigation to reflect back to the so-called 'Golden Age of Islam' when there seemed to have been development in science; and an acceptance of harmony between religion and science. This article examines how the tenets of Islam, and the Islamic view of nature facilitated the development of science in the so-called 'Golden Age of Islam'; how the Western view of nature conflicts with the Islamic view. And how common or universal values can help build bridges between modern science and Islamic science.

Islam is not just a way of life but a civilization, in which the way of life may vary "from one Muslim country to another, but is animated by a common spirit far more humane than most Westerners realize" (Mazrui, 1997, p. 118). The religious life of Muslims in Islamic countries is governed by the tenets of Islam. Very briefly these tenets are considered, along with the values that they exemplify, in the following section.

TENETS OF ISLAM

Islam is not so much about believing in the faith but how Muslims respond to the faith, that is, "not so much a noun but a verb, an action" (Ball and Haque, 2003, p. 317). Ball and Haque (2003, p. 315) argue that "Islam is tantamount to accepting a way of life – spiritually, politically, and socially, about how to behave in family and public life", Islamic values impact on all areas of

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society. In Arabia in the early seventh century, God or *Allah*[2] through the Prophet Muhammad (PBUM), revealed the religion of Islam, which means 'to surrender' or "submission to the will of God" (Donner, 1999).

At the core of the belief system of Islam are the five pillars of Islam, along with core values, laws, and behaviours outlined in both the *Quran*; and the practice (*Sunna*[3]) and teaching (*Hadith*[4]) of the Prophet Muhammad (PBUM[5]) (Moore, 2006). Monotheistic in nature, Islam claims that human beings believe in the "same God, have similar needs, wants, and experiences, and can relate to a set of universal moral principles" (Cornell, 1999). Thus the Islamic set of moral principles is good for all mankind, regardless of race, ethnicity, gender, or origin (Moore, 2006). Islam's rapid expansion in the seventh and eighth centuries, as well its vigour today, lies in its claim of universal validity across time and space (Cornell, 1999).

Individuals can convert to Islam by practising the Five Pillars of Faith and adhering to the core values, laws, and behaviours outlined in the *Quran* and the *Hadith*, teachings of Prophet Muhammad (PBUM). The first pillar of Islam is called *Shahadah* (the act of bearing witness). The *Shahadah* requires that a Muslim declare his or her devotion to Allah or God by declaring "there is no God but Allah and Muhammad is the messenger of Allah". Therefore by this profession of faith Muslims assert that Allah is the only God, and not part of the pantheon (Moore, 2006). Thus clearly Islam rejects the concept of 'Trinity' and presents a direct theological challenge to Christianity. For 14 centuries this has been at the heart of the tension between Christianity and Islam (Smith, 1999) with intractable views held by both religions that prevent any compromise.

The second tenet or pillar of Islam requires Muslims to pray at five specified times during the day. The establishment of prayers is stated in the *Quran* and was demonstrated by the Prophet Muhammad (PBUM) during his lifetime (*Sunna*). While performing prayers Muslims must face the Great Mosque (*Holy Kaaba*[6]) in Mecca, the holiest city of Islam (Cornell, 1999).Prayers or *al-salat* are viewed as a vital component of submission to the will of Allah, and "involve a variety of important rituals, each signifies the centrality of prayer in Islamic life". By performing the prayers five times a day, "Muslims acknowledge humanity's total dependence on the will of Allah" (Moore, 2006, p. 141).

The third pillar of Islam is *Zakat* or charity, giving of one's wealth for the benefit of the poor. The *Quran* mandates this as 2.5 percent of the individual's saving, to be used to help the less fortunate in the society. The *Zakat* reflects the importance of charity and emphasizes the *Quranic* view of social justice and compassion.

The fourth pillar of Islam involves fasting or *al-saum* from sunrise to sunset in the month of Ramadan[7]. During Ramadan, Muslims abstain from food, drink, and sex during the day. By fasting, Muslims develop a deep sense of devotion to Allah, and that helps them participate in, and be responsible to, a larger moral community (Cornell, 1999).

The fifth pillar is the *hajj* or annual pilgrimage to Mecca, Saudi Arabia. The *hajj* must be preformed by every healthy and financially able Muslim once in their lifetime. It is undertaken in *Dhul-Hijjah*, the twelfth month of the Islamic lunar calendar. The pilgrims perform *hajj* repeating the rituals that were performed by the Prophet during his last pilgrimage. The *hajj* symbolizes the

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[2] *Allah*: in this paper Allah will be used to represent God as stated in the Islamic belief system.

[3] *Sunna*: the habits and the religious practice of the Prophet Muhammad (PBUM)

[4] *Hadith*: documented traditions of the teaching, actions, and sayings of the Prophet Muhammad (PBUM).

[5] PBUM: means peace be upon the Prophet Muhammad and is written after his name as a mark of respect.

[6] Holy Kaaba: the cube-shaped shrine in the holy city of Mecca is considered the earthly house of God and the most sacred in the Islamic world.

[7] Ramadan: is the ninth month of the Islamic lunar calendar.

believer's entry into the earthly House of God in Mecca, a replica of the cosmic House of God in the Seventh Heaven (Cornell, 1999).

Furthermore, Muslims have a belief in Allah's angels; a belief in Allah's revealed texts, including the *Quran*; a belief in Allah's messengers; a belief in the day of judgement (the world has been created for a fixed period of time); and a belief of Allah's complete control over worldly affairs (Cornell, 1999). Moreover, in Islamic societies religion and politics are closely linked. The Islamic society is supposed to be governed by the *Shariah* and *Fiqh*, two complex sources of *Quranic* law. These *Quranic* Islamic laws provide justifications for formation and implementation of laws that govern religious practices and obligations, social life, marriage and divorce, commerce and business, taxation, government, criminal justice, economics, and other areas (Kamali, 1999).

While Islam, like Christianity and Judaism, is a highly complex religion that has scholars debating interpretations of Islamic values, history, laws and practices, the above mentioned core tenets and beliefs are not debatable. Based on these tenets Man (human being) has a designated role to play on earth.

ROLE OF MAN AS STATED IN THE QURAN: KHĀLIFAH AND AMĀNA [STEWARDSHIP AND TRUST]

The purpose for the creation of mankind and Man's role as stated in the *Quran* is that human beings have been placed on the earth as God's representative or '*Khalifah*'. The *Quranic* doctrine of vice-regent or '*Khālifah*' placed Man in the role of *Amāna* or trustee and custodian of the earth, thus responsible for building the earth and utilizing its resources with a sense of justice to oneself and to fellow mankind (Kamali, 2003). While nature can be said to be man's testing ground, man is instructed to read it's 'signs' (Manzoor, 1984, p.156) in order to understand God. Thus Muslims developed natural science in order to understand God and fulfil their role as God's representatives.

The role assigned to 'Man' by the *Quran* included accountability of the numerous resources given by God or *Allah*. Moreover, the Islamic concept of knowledge includes both the transcendental knowledge as well as the knowledge based on sense perception and observation. Consequently, all knowledge gained through scientific activities aims to result in human welfare; and seeks to utilize the resources of the universe for beneficial purposes; (Kamali, 2003), that is, there is both social justice and compassion. Hence all scientific endeavours by scientists need to be scrutinized by the values, ethics and theological standards as encompassed in Islam.

ISLAMIC VIEW OF NATURE VERSUS WESTERN VIEW OF NATURE

In Islam the purpose of nature is for man 'to study nature in order to discover God and to use nature for the benefit of mankind'. Nature can be used to provide food for mankind and its bounty is to be equally distributed among all peoples. All activities that cause harm to mankind and in turn destroy nature are forbidden. Destruction of the natural balance is discouraged, for example, unnecessary killing of animals or removal of vegetation may in turn lead to starvation due to lack of food. This view is an extension of the idea that 'Man' has been placed on earth as God's representative (Faruqi, 2006a; Zaidi, 1991; Said, 1989). Modern-day Muslims scholars advocate that scientists and scholars are best motivated by these underlying values when undertaking scientific endeavours.

The Islamic view of nature has its roots in the *Quran*, the very word of God and the basis of Islam. The following passages from the *Quran* illustrate the relationship between nature and man and how this relationship inspires Muslim scholars to study natural phenomenon, in order to understand God (Wersal, 1995). The following verses also show the way the *Quran* presents the whole universe:

> We created not the heavens, the earth, and all between them, merely in (idle) sport; we created them not except for just ends. But most of them do not understand (Surah Al-Dukhān 44: 38-39, [Ali, 1989, p. 1289]).
>
> Behold! In the creation of the heavens and the earth; In the alternation of the night and the day; In the sailing of the ships through the ocean for the profit of mankind; In the rain which Allah sends down from the skies And the life which He gives therewith to an earth that is dead; In the beasts of all kinds that He scatters through the earth; In the change of the winds and the clouds which they trail like their slaves between the sky and the earth - (here) indeed are Signs for a people that are wise (Surah Ad-Baqarah 2: 164 [Ali, 1989, p. 64-65]).

Thus mankind is inspired to study, understand and mould the natural forces for its own purposes. The point to note is the general empirical attitude of the *Quran* that engendered in its followers a feeling of reverence and thus made them founders of an enlightened society (Iqbal, 1986). This view of nature influenced the scholars of the so-called 'Golden Age of Islam' to undertake scientific activities that resulted in the vast corpus of scientific works of that era.

The Western view of nature that emerged after the Scientific Revolution was that "no footprints of the divine can be discerned in the sands of the natural world" (Peters, 2003, p. 33). Furthermore, any commonality that existed between the sciences that emerged in the Europe and those that had developed in the Islamic civilization "was rent asunder by the rise of modern science" (Nasr, 1996, p. 129). Seyyed Hossein Nasr, notes in his work *Religion and the order of nature*, (1996, p. 133)

> From the idea of cosmic order and laws created by God through His Will and applicable to both men and nature to the idea of 'laws of nature' discoverable completely by human reason and usually identified with mathematical laws, divorced from ethical and spiritual laws, there is a major transformation that played a central role in the rise of modern science. This new idea of laws of nature also eclipsed the earlier Christian understanding of the subject, although later theologians tried to 'Christianize' the seventeenth-century scientific concept of laws of nature. Interestingly enough, such an event did not take place in other civilizations with a long scientific tradition such as the Chinese, Indian, and Islamic, and this is of great significance in the parting of ways between the modern West and other civilizations as far as the understanding of the order of nature and its religious significance are concerned.

In the final analysis, it seems that Europe decided to transform the medieval science that had been influenced by the Islamic scientific traditions. Plato replaced Aristotle, and mathematics was the new tool of science. With contributions from Nicholas Copernicus (1473-1543), to Galileo Galilei (1564-1642), and Johannes Kepler (1571-1630) it climaxed with Charles Darwin's work '*The Origins of Life*' in the biological sciences and had philosophical implications.

Koyré (1892-1964), a respected French historian of science, (cited in Iqbal, 2002, p. 29) stated that

> What the founders of modern science did was neither refinement, nor improvement of what they had inherited; they had to actually destroy one world and to replace it with another. They had to reshape the framework of our intellect itself, to restate and to reform its concepts, to evolve a new approach to Being, a new concept of knowledge, a new concept of science.

DEVELOPMENT OF ISLAMIC SCIENCE IN THE GOLDEN AGE OF ISLAM

In the so-called 'Golden Age of Islam' inspiration for the development of sciences was found in the *Quran*. Moreover, scientific activities were undertaken for the betterment of mankind; therefore the sciences that initially attracted the attention of Islamic scholars were medicine, mathematics, pharmacy, and pharmacology (Faruqi, 2006b). In addition, major scientific works were carried out under the patronage of rulers whose primary interests lay in the benefits derived from these scientific works for the peoples they ruled (Sabra, 1996).

In Islam it must be understood that there is no 'philosophy' as recognized by Western standards. For traditional Muslims, answers to questions pertaining to God, the creation of the universe, and the destiny of mankind, could be sought in the *Quran*, (Faruqi, 2006a&b). Some orthodox Muslims subjected *Quranic* verses to *Kalam* or a theological discipline involving rational dialectical examinations (a form of Muslim scholastic theology). Philosophers like Al-Kindi (800-870), Al-Farabi (d. 950) were inspired by the translations of the works of Aristotle. They attempted to reconcile Aristotelian and Platonic ideas with revelation thus trying to build a bridge between belief and reason (Taton, 1963). Al-Farabi's works illustrated that Aristotelian logic had scriptural support in the *Quran* and the prophetic *hadith* (Bakar, 1999). Al-Farabi and Ibn Sina/Avicenna (980-1037) tried to develop the use of logic within the framework of religious consciousness of the Transcendent. Al-Farabi and Ibn Sina wrote works which sought to demonstrate that logic, when used correctly, could in relation to religious truths help explain their rationality and clarify overall consistency (Armstrong, 2000; Sarton, 1927). However, there emerged opposition to Aristotelian logic from within both religious and intellectual quarters.

Abu Bakr al-Razi/Rhazes (d. 925) was probably the first to write a critique on Aristotle's logic. Al-Ghazzali (1058-1111) wrote his famous critique of the earlier philosophers such as Al-Farabi and Ibn-Sina, entitled '*Tahâfut al-falâsifa* or 'The Incoherence of the Philosophers' who had been inspired by Aristotle. Al-Ghazzali accentuated the unacceptability of the three metaphysical claims: (a) the denial of bodily resurrection; (b) the limitation of divine knowledge to universal, eternal truths; and (c) the doctrine that the world is eternal (King 2004, p.58). Al-Ghazzali denounced these claims and all who held these beliefs were disbelievers. But Al-Ghazzali also wrote works which encouraged the use of logic for enhancing religious understanding, but reason always was subservient to revelation. According to Al-Ghazzali, "the *Quranic* term *al-mĩzān* usually translated as the balance, refers among other things to logic. Logic is the balance with which man weighs ideas and opinions to arrive at the correct measurement or judgement" (Bakar, 1991, p.4). Al-Ghazzali being a scientist and religious scholar was able to combine religious beliefs with the scientific ideas of the time (Faruqi, 2006b).

However, Ibn Rushd/Averroes (1126-98) wrote '*Tahâfut al-Tahâfut* or the 'Incoherence of the Incoherence' a rebuttal to the arguments presented against philosophers in Al-Ghazzali's (1058-1111) *Tahâfut al-falâsifa* (Taylor, 2000). Ibn Rushd sought to prove that there was nothing either philosophically or religiously objectionable in Aristotelian doctrine of the eternity of the world (Faruqi, 2006). Ibn Rushd's works demonstrated the relationships that existed between religious thinking and the scientific developments of this period. Ibn Taymiyyah (d. 1328) and Ibrahim al-Shatibi (d. 1398), both undertook inquiries and systematic refutation of Aristotelian logic. This demonstrates the intellectual struggle between Islamic science based on the Quranic worldview and Greek thought.

The inspiration for Islamic philosophy and science appears to have been the ancient knowledge consisting of Greek, Indian and others that the Muslims acquired through the translation movement of the eighth and ninth centuries. Muhammad Iqbal (d. 1939) undertook an incisive analysis of the Greek philosophy and its comparison with the worldview of the *Quran* (Kamali, 2003). Muhammad Iqbal refuted some of the hitherto parallels that had been drawn between the two. Iqbal acknowledged that the "Greek philosophy had been a great cultural force in the history of Islam" (Iqbal, 1986, p. 3), but the worldview of the *Quran* which inspired the Muslim scholars

was different from the Greek thought. For example, Aristotle wrote extensively on physics without undertaking a single experiment; and on natural history without determining the most easily verifiable facts (Kamali, 2003). Socrates postulated that the study of man alone, was sufficient in the study of the human world, whereas the *Quran* encompasses that all of nature must be studied, the "humble bee a recipient of Divine inspiration" and "to observe the perpetual changes of the wind, the alternation of day and night, the clouds and the planets swimming through infinite space" (Kamali, 2003).

Furthermore, the *Quran* deems 'hearing' and 'sight' as valuable instruments in the process of learning. Thus Islamic science developed in scientific inquiry the method of observation and experimentation. Therefore the experimental method that developed in "Islam was not due to a compromise with Greek thought but to a prolonged intellectual warfare with it" (Kamali, 2003). Consequently, this resulted in the magnificent developments in science during the period from the twelfth to the fifteenth centuries in the various territories of the Islamic Empire, Baghdad, Andalusia, and Sicily (Faruqi, 2006).

Subsequently, it was this Islamic science that made its way to Europe through North Africa, Sicily and Spain. Beginning from the end of the tenth century this knowledge began to filter back to Europe through the translations of Arabic versions of the Greek knowledge and the original Greek treatises (Burnett, 2001). But also transferred to Europe were the seminal contributions of scholars of the Islamic world. Modern science as we know it today works with theories and models that must be tested empirically. This was standard practice in the fields of mathematics, astronomy and medicine in the Islamic world of 1000 years ago. The Muslims developed the procedures for testing knowledge both empirically and logically (Faruqi, 2006b). More over, an important characteristic of Islamic science was its experimental character. Islamic scientists were interested especially in the applied sciences, in the construction of apparatus, in testing theories by undertaking observations, and analysis of results through mathematics (Bammate, 1959). These ideas and procedures were all available before the times of Galileo and Newton to whom they have been largely attributed in Western Europe (Faruqi, 2006a).

Europeans have been slow to acknowledge the Islamic origins of their scientific method. Bacon, who has been credited with the invention of experimental method, studied in the Islamic universities of Spain (Kamali, 2003). Bacon acknowledged this and emphasized the importance of Arabic science (cited in Kamali, 2003) and probably used the original Arabic works of Ibn al-Haytham/Alhazen (965-1039) as well as Latin translations (Meyers, 1964). Thus by promoting the use of experiments in scientific research, al-Haytham played an important role in setting the scene for modern science (Rashed, 2002, p.773).

However, the development of modern science and technology led to the separation of facts from values and this has resulted in destructive consequences for humanity that have arisen from some scientific discoveries (Golshani, 2003). Production of chemical, biological and nuclear weapons can be cited as examples, as well as the side effects of preservatives, chemicals and pollutants in our food and environment. Furthermore scientific progress has raised serious ethical issues in terms of human or animal subjects and public safety (Golshani, 2003). Consequently, in the Islamic world and in the West, Muslim scholars need to tackle these issues using all the tools available including religious knowledge.

TO BUILD BRIDGES BETWEEN ISLAMIC SCIENCE AND MODERN SCIENCE

In Islam, the acquisition of knowledge, be it scientific or non scientific is not an end in itself but "one method to comprehend the glory of God" (Al-Hayani, 2005, p. 565). Moreover, scholars of Islam have displayed their "diversities in theme and orientation that demonstrated the dynamic nature of Islam, far from its image that has been portrayed in certain media as a monolithic and stagnated system of ideas" (Moaddel and Talattof, 2000, p. 1). Throughout history there have been clashes between religion and science, with all religions trying to find solutions to problems

and ramifications of new scientific discoveries. With the advent of modern science the central theological problem that Islamic scholars were confronted with was "the question of the validity of the knowledge derived from sources external to Islam and the methodological adequacy of the four traditional sources of jurisprudence: the *Quran*, the dicta attributed to the Prophet (*hadith*), the consensus of theologians (*ijma*), and juristic reasoning by analogy (*qiyas*)" (Moaddel and Talattof, 2000, p. 1).

Some intellectuals have tried to formulate reform in Islamic sources of knowledge, in line with the prevailing standards of scientific rationality and modern social theory. These include intellectuals and theologians such as Sayyid Jamal al-Din al-Afghani, Sayyid Ahmad Khan, Chiragh Ali, Muhammad Abduh, Amir Ali and Shibli Nu'mani (Moaddel and Talattof, 2000, p. 2). These Islamic scholars were influenced by the West, especially by its achievements, "ranging from scientific and technological progress, the Newtonian conception of the universe, Spencer's sociology, and Darwinian evolutionism, to the Western style of living" (Moaddel and Talattof, 2000, p. 2). Clearly there is debate and disagreement between the scholars who have tried to interpret development of modern scientific thought within the context of Islamic historical and religious perspectives. The author is of the view that in order to enhance understanding there is a need for further input and active participation of scholars engaged in research in modern scientific development in the West with Islamic thought. Therefore there is a need for discourse between Islam and Western science, rooted in the *Quran* (Iqbal, 2002) on the one hand, and between Western science and religious thought on a global setting on the other hand. In both cases, the origins of modern science over the past 1000 years needs to be better understood since it appears to be different from the views that have been promulgated in the United Kingdom and the United States during the nineteenth and twentieth centuries.

CONCLUSIONS

Some characteristics may be included in the further study of nature in an Islamic context warrant consideration. Golshani (2000a) has raised three fundamental questions:

(1) "Such a study should be pursued within the framework of the Islamic worldview. This worldview is characterised by the holistic approach and is premised on the unicity of nature, which is an indication of the unity of nature's Creator. The idea of unity of the creator is the fundamental principle of Islam and overrules all other ideas" (p. 609).

(2) Furthermore science from an Islamic outlook must show the interrelatedness of all parts of the universe. Indeed when empirical data are collected, the researcher must pay attention to details and this requires "the division of knowledge into various disciplines. But one is not supposed to forget the whole at the expense of the parts" (p. 611).

(3) "Modern science has neglected teleology" (p. 610). Some scholars believe the world has no purpose, while others consider teleology futile. However, in the *Quranic* view the world has a telos and it is stated in the *Quran* that mankind should not neglect this aspect of existence, "do they not reflect in their own minds? Not but for just ends, and for a term appointed, did Allah create the heavens and the earth and all between them. Yet there are truly many among men who deny their meeting with their Lord" (Surah Al Rūm 30: 8 [Ali, 1989, p. 1009]).

For Muslims to tackle the contemporary modern world with self-assurance and confidence there is the need to rediscover and restore the "mainsprings of Islamic civilization. They need to re-build an idea of Islam which includes justice, integrity, tolerance and the quest of knowledge the classic Islamic civilization (Ahmed, 2002, p. 44). Furthermore other peoples need to learn from the holistic Islamic approach and benefit from learning the facts about the medieval Islamization of Western science. This aspect needs to be fully researched, accepted and incorporated in specialized works and in the teaching materials of schools and colleges around the world. Thus by

acknowledging the Muslim contributions to scientific knowledge bridges can be built both within Islamic communities and others.

Polkinghorne (1998, pp. 124-125) has argued this well:

> It is essential that Christians and other religious people should seek what common ground they find with all other people of good will in trying to articulate an ethical basis for caring for our world. Perhaps that common ground can be found in the acknowledgement of a respect for all humanity and for life and for the world that gave us birth. We need a sharp concept of the common good, wide enough to embrace the natural world and future generations

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