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To Whom It May Concern,

This letter certifies **Shaik Abdullah Hassan** attended and presented the paper, "**The Philosophy of Research Methodology: A View from Islamic Civilization**", at the *International Conference on New Directions in the Humanities*, Istanbul, Turkey, from 15-18 July 2008.

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The Philosophy of Research Methodology: A View from Islamic Civilization

By:

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The aim of this article is to highlight the philosophy of research methodology as view from Islamic civilization. Scientific research has no central focus in our modern terms apart from further dominance of nature, refining our materialistic gain and maximizing the control of wealth, improving our health and live a life full of sensual pleasure with no misery. Sadly what was vision was never fully materialized, the upper echelon of the society gained the full benefit while the lower societies were left out and further denigrated.

The central theme of scientific research in Islam is 'Tawhid' or the oneness of God. This theocentric nature of philosophy of scientific research has proven in the annals of Islamic civilization, able to provide the physical as well as the spiritual needs of the society equitably. The great Islamic centres of civilization such as Cordova, Isfahan, Baghdad and Istanbul were at their splendor the centres of excellent scientific research and discoveries, and at the same time places for spiritual solace and tranquility. This remarkable achievement was primarily because of the philosophy outlook of scientific research in Islam which in sharp contrast with our modern philosophy of research of science.

We will be highlighting these Islamic philosophies, which not only need to be studied and discussed, but also the need for such a philosophy of scientific research urgently to be cultivated and propagated in our contemporary scientific world in order to create a man and a society who's sound in mind, tranquil in soul and at the same time excellent in material and scientific achievements. This eventually will create a balance civilization and peace that upholds the principle, justice, love of knowledge and wisdom, social integration, peace and harmony for the humankind as a whole.

Keywords: Philosophy, Research Methodology, Islamic civilization

Stream: Philosophy, Ethics, Consciousness

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The Philosophy of Research Methodology: A View from Islamic Civilization

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Abstract

The aim of this article is to highlight the philosophy of research methodology as view from Islamic civilization. Scientific research has no central focus in our modern terms apart from further dominance of nature, refining our materialistic gain and maximizing the control of wealth, improving our health and live a life full of sensual pleasure with no misery. Sadly what was vision was never fully materialized, the upper echelon of the society gained the full benefit while the lower societies were left out and further denigrated.

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Introduction

When we speak about research methodology from Islamic civilization, it's basically fundamentally related to the philosophy and ethical foundations that have been expounded in the Quran and Prophetic Hadith. But it is necessary to emphasize that Quran and Hadith is not a book of 'science' per se but a book of 'signs' or 'ayah' which leads mankind to the correct central point of returning to his primordial nature, that is returning to his nature as 'khalifah' (the vicegerent of God) in complete obedient and submission to Allah SWT.

This ontological dependent of man to Allah in his every endeavor to understand himself and the nature in every methodology that he applied either experimental, intellection or ratiocination, is formed the very foundation of Islamic science which derived the constant guidance and framework from Quran and Hadith.

Islamic research methodology eventually will culminates in what we would like to name as Islamic science. Islamic science by definition as explained by Osman Bakar (1991) in his book '*Tawhid and Science* mean the totality of the mathematical and natural sciences, including psychology and cognitive science, cultivated in Islamic culture and civilization for more than a millennium beginning from the third century of the Islamic era (the ninth century of the Christian era). They are, conceptually speaking, organically related to the fundamental teachings of Islam, the most important of which is the principle of *tawhid* (Osman Bakar ix : 1991).

This complete historical, philosophical, epistemological and ontological dependence on God as being the foundation of Islamic science, is now being scandalized by modern man even by these who so called Muslim scientists who segregated the Islamic holistic outlook of science, compartmentalized science into segregated, pathetic worldview and truncated science from any association with God, the All Powerful. 'Man has abused his trusteeship in God's world. He has employed his scientific knowledge to exploit nature rather than to use it wisely in accordance with God's Will' (G.D. Yarnold 1959: 168).

Scientific research one way or other will have to utilize nature as its subject of study as well as its ultimate object of discovery. Unfortunately, In modern science, nature has lost its sacred character. The natural world has been emptied of its spiritual content. Consequently, nature is no longer seen as having a meaningful role in religious and spiritual life. (Osman Bakar 66: 1991).

In Islam said Professor Seyyed Hossein Nasr (1976), the eminent scholar, “the inseparable link between man and nature, and also between the sciences of nature and religion, is to be found in the Qur’an itself, the Divine Book which is the Logos or the Word of God. As such it is both the source of the revelation which is the basis of religion and the macrocosmic revelation which is the Universe. He further elaborates, “it is both the recorded Qur’an (al Qur’an al-tadwini) and the Qur’an of creation (al Qur’an al-takwini) which contains the “ideas” or archetypes of all things. That is why the term used to signify the verses of the Qur’an or the ‘ayah also means events occurring within the soul of the man and the phenomena in the world of nature”. In fact the Qur’an asserts “We shall show them our portents upon the horizon and within themselves until it be manifest unto them that it is the Truth” (Qur’an 41 : 53).

Islamic Philosophy of Research Methodology Versus Modern Philosophy of Research Methodology

It is crucial to understand the fundamental differences between the two philosophies of research methodology of science, i.e. Islamic science and modern science in order to comprehend the *weltanschauung* of the two sciences. The very difference of the research methodologies became the basis for the tranquility and serenity of the man of science and the society living in the age of Islamic civilizational supremacy compared to the constant internal turmoil, depression, clashes and confrontation of the modern scientist and the people living in the modern society. Islam views nature as sacred, as legitimate ‘wife’ which need to be handled with utmost care and responsibility as a guardian, whereas modern science looked at nature as profane, as a ‘prostitute’ which can be scandalized without slightest care and concern for the sole purpose of human use, even if it causes destruction to the ecology and the balance of nature. This greed and avarice to manipulate nature for self-satisfaction, itself led to doom and destruction of man of

modern age. Modern man has lost his centre, his reason for existence and he has extinguished the primacy of God and replaced in 'His' place, his own selfish needs and greed. Fritjof Schuon in his book *To Have A Center* (1990) , page 37 said :...humanistic culture, insofar as it function as an ideology and therefore as a religion, consists essentially in being unaware of three things : firstly, of what God is, because it does not grant primacy to Him; secondly, of what man is, because it puts him in the place of God; thirdly, of what the meaning of life is, because this culture limits itself to playing with evanescent things and to plunging into them with criminal unconsciousness. In a word, there is nothing more inhuman than humanism..."

Prof Seyyed Hossein Nasr in his book *The Encounter of Man and Nature* (1968) said : "In fact it might be said the main reason why modern science never arose in Islamic civilization or any of the other cultures of the east is precisely because their religion structures refused to regard nature as profane. The most basic reason is that neither Islam, nor China was the substance of nature so depleted of its sacramental and spiritual character nor were the intellectual dimensions of these cultural traditions so enfeebled as to enable a purely secular science of nature and a secular anti-religious philosophy to develop outside the matrix of traditional orthodoxy. Historic Islam is a perfect example of this truth and the fact that science and technology in its present form did not develop in its bosom is not a sign of decadence, as is claimed, but the refusal of Islam to consider any form of knowledge as purely secular and divorced from what it considered as the ultimate goal of human existences. By refusing to separate man and nature, Islam preserved an integrated view of the Universe and sees in the cosmic and natural order the flow of divine grace and blessings. Man in Islam seeks the transcendent and the supernatural, not against the background of a profane nature that is intrinsically opposed to the supernatural, but rather seeks to transcend nature and nature herself can be an aid in this process, providing man can learn to contemplate it, not as an independent domain of reality but as a mirror reflecting a higher reality, a vast panorama of symbols which speak to man and have meaning for him. Within Islamic civilization there were not one but many different sciences all integrated in unified concepts of knowledge. There were the juridical, social and theological sciences; there were the mystical and metaphysical ones all derived in their principle from the source of revelation which is the Quran. Then they have developed within Islamic civilization highly developed philosophical, natural,

medical and mathematical sciences which although benefiting greatly from the Greek, Persian, Indian, and Chinese learning and inventions, were all integrated into the Islamic world-view and totally muslimized” (Nasr 1968 : 94-99).

The very basis for the destruction of western civilization was due to the annihilation of the religious ethical foundation in life. “Westerners view their civilization” said Maryam Jamelah (1976), as superior to all others because they say that it has achieved more scientific and technological progress in a century than the rest of mankind in all previous ages combined . It is only because of the rule of materialism that modern science and technology are what they are today. It is the natural of all the best minds and talents being concentrated on the single goal of achieving the maximum power, speed, efficiency, pleasure, comforts and conveniences in the shortest possible time. Non-Europe cultures, including Islamic civilization, never achieved this degree of technological proficiency not because technology was ever reject on principle, but because the best minds were diverted to other goals considered of greater value. It is a fact of life that you want to achieve something badly enough and are willing to sacrifice and subordinate all other considerations, you will naturally outstrip and excel all other peoples in this particular respect. Such is the case of modern Western civilization with respect to science and technology (Maryam Jamelah 1976: 7-8).

Ethical Foundation of Science

The Quran and Hadith is not a compendium of science but it provides knowledge of the principles of science which it always related to metaphysical and spiritual knowledge. Islam gives legitimacy to a science only if it is organically related to the knowledge of God. Every field of science is directly derives its ethical foundation from Qur’an and Hadith. Consequently, Islamic science possesses a religious and spiritual character. According to the famous Muslim scientist, Ibnu Sina (Avicenna), ‘that science is true science which relates knowledge of the world to the knowledge of the Divine Principle’ (F. Brunner 1955: 13).

The Quran is the fountainhead of Islamic intellectuality and spirituality. It is the basis not only of religion and spiritual knowledge but of all kinds of knowledge. It is the main source of inspiration of the Muslim vision of the unity of science and spiritual knowledge. The idea of this unity is a consequence of the idea of the unity of all knowledge. The latter in turn derived from the principle of Divine Unity applied to the domain of human knowledge (Osman Bakar 62: 1991).

Ethico-Philosophical Foundation Enumerated In the Qur'an and Hadith

1) Islamic World View of Nature

Nature in Islamic viewpoint represents the 'reflection' of God. God created the nature so that man can understand Him. Nature is as a book of symbols. In Islamic sense, symbol is the 'reflection' in a lower order of existence of a reality belonging to a higher ontological status. Al Ghazzali in his book *Mishkat al-Anwar* said "everything that exists in the natural world is a symbol of something in the higher world".

2) The Philosophy And Ethics of A Muslim Scientist

The central theme of the Muslim scientist's philosophy and ethics emanates from the concept of *ihsan*, which means the 'perfection', that is to work, worship and to behave in a manner that you always 'see Him' but if you can't 'see Him' than have a conscience that He always 'sees' you. A Muslim scientist have a heavy duty and responsibility as a vicegerent of God, to be peace with himself, peace with the people and finally peace with God. To achieve that he have to be guided by the philosophico-ethical codes and conducts originated from the Quran and Hadith.

A Muslim scientist always look at the inner dimensions of every work or experiment he does which finally leads him to the Divine unity. Whatever achievements he succour, he always bound himself before the Almighty God in humiliation in praising Him and uttering "everything belongs to Him and shall return to Him". Generally there are ten principals which generate the basic values of an Islamic culture of research methodology which was formulated during Stockholm seminar of (1981) on "*knowledge and values*" : *tawhid* (unity), *Khalifah* (vicegerency), *ibadah* (worship), *ilm* (knowledge), *halal* (permissible) and *haram* (prohibited),

given you: for your Lord is quick in punishment: yet He is indeed Oft-forgiving, Most Merciful.” (Qur’an, 6:165)

iii) ***Ibadah* (worship)**

Allah said : I have created jinns and men only that they may serve Me.. [Qur’an 51:56]

In Islam every act if its intention is based solely in seeking the pleasure of God is Ibadah. Therefore every Muslim scientist should have a correct niyyat (intention), so that every acts and works of a scientist becomes a form of ibadah, constantly receiving grace from God.

Worship must be alive, inspired with the love of Allah, and productive of right action (ihsan). The Messenger of Allah (may the blessings and peace of Allah upon him), when asked about (ihsan). said: It is to worship Allah as though you see Him, and though you see Him not, yet truly He sees you. (Bukhari and Muslim)

iv) ***Ilm* (knowledge)**

Ilm is mentioned in the Quran with unusual frequency and has been paired, in verse 30:56, with *imam*, faith, which according to verse 3:71, follows upon knowledge. The pursuit of *‘ilm*, according to a hadith, is incumbent upon every Muslim even if it entails traveling to China. However, *‘ilm* become a value only if it is pursued within value-framework of Islam. Unlike the western hackneyed phrase of “knowledge’s sake;” or that entire convoluted argument that “all knowledge is good,” Islam considers *‘ilm* a value and an act of *‘ibadah* only when it is pursued for the benefit of the individual or the community and ultimately for gaining the pleasure of Allah (A. Rashid Moten 1994: 140-141).

Finally Imam Ghazali, the great scholar of Islam summarizes the importance and the value of knowledge for a Muslim as such :

Seek knowledge. It inspires fear (of Allah). Seeking it is worship. Discussing it is like praising the name of Allah. Struggling for it is a form of Jihad. Teaching it is charity. Giving it away to those deserving it is a way to get nearer to Allah. It is a

adl (justice), *zulm* (tyranny), *istislah* (public interest), and *dhiya* (waste) (Zaiuddin Sardar (ed) 1984).

i) ***Tawhid* (unity of Allah)**

The essential characteristic of Islam is the recognition of the unity of Allah, which affirms the radical monotheism of Islam. Allah is one, He has no partner and there is none worthy of worship except Him. Allah the Most Exalted Said:

Say (O Muhammad (Peace be upon him)): "He is Allah, (the) One." Allah-us-Samad (The Self-Sufficient Master, Whom all creatures need, He neither eats nor drinks)." He begets not, nor was He begotten; And there is none co-equal or comparable unto Him." (al-Ikhlās 112 :1-4).

This belief produces in man the highest degree of self-respect and self esteem. The believer knows that Allah alone is the Possessor of all power, and that none besides Him can benefit or harm a person, or provide for his needs, or give and take away life or wield authority or influence. This conviction makes him indifferent to, and independent and fearless of, all powers other than those of God. He never bows his head in homage to any of God's creatures, nor does he stretch out his hand before anyone else. He is not overawed by anybody's greatness. This attitude of mind cannot be produced by any other belief. (Maududi 1980 : 69).

ii) ***Khilafah* (vicegerency)**

The human being, in the Islamic world-view is considered a vicegerent (*khalifah*). In her/his capacity as a vicegerent, the human being is perceived as the trustee of the earth. She/he is not supposed to cause corruption in any form on earth (i.e. the environment). Life on earth entails great responsibilities. It is a test with accountability. It is followed by either reward or punishment. These meanings are mentioned in the Qur'an and the Sunnah. Vicegerency as a test is found in the following verse:

"It is He Who has made you (His) vicegerents, inheritors of the earth: He has raised you in ranks, some above others: that He may try you in the gifts He has

companion in solitude, a friend in loneliness, a guide for religion, a fortifying factor when one is overwhelmed by pleasure or sorrow, a consoling friend when one is abandoned, akin when one is surrounded by strangers. It is a light on the way to Paradise. With it Allah raises people thereby making them leaders, masters and guide, followed and emulated. Their steps are traced and their deeds are watched. The angels aspire to befriend them and with their wings they touch them; and everything – wet and dry – ask for forgiveness on their behalf, including the fishes and insects in the sea and the beasts and the cattle on the land and the heaven and its stars.(Imam Al-Ghazzali)(Muhammad Abd. Rauf 1991: 20-23).

v) ***Halal*** (permissible) and ***Haram*** (prohibited)

A Muslim scientist should have a clear view about ***Halal*** and ***Haram*** in Islam. ***Halal*** includes all the knowledge and activity that is beneficial for an individual, society and the environment. Whereas ***Haram*** or blameworthy research includes all that is leading to the destruction of man and his society, environmental crises and degrading humans mentally and spiritually. Research that desacralize nature, dehumanize and promoting alienation and others which are per se evil are therefore outwardly rejected.

The Qur'an shows that there is a correlation between the behavior of people and the conditions of the environment. The right and moral behavior yield positive results:

“If the people of the towns had but believed and feared God, We should indeed have opened out to them (all kinds of) blessings from heaven and earth...”
(Qur'an, 7:96)

The opposite is also true. Disbelief and swerving from the right path that God has designated for humanity will result in negative impact on the environment:

“But whosoever turns away from My Message, verily for him is a life narrowed down ...” (Qur'an, 20:124)

vi) **Adl** (justice)

Justice in Islam is 'to put things in its proper place'. A Muslim scientist with his research will always focus his attention to do justice to the research he's doing so that he attains to the Divine Unity.

The concept that justice means a harmonious condition or state of affairs whereby every thing is in its right and proper place such as the cosmos; or similarly, a state of equilibrium, whether it refers to things or living beings. With respect to man, we say that justice means basically a condition and situation whereby he is in his right and proper (al-Attas 1992 : 25).

Islam is a religion of justice. God has said:

Truly God commands you to give back trusts to those to whom they are due, and when you judge between people, to judge with justice (Quran, 4:58).

The Prophet Muhammad SAW said: People, beware of injustice, for injustice shall be darkness on the Day of Judgment. (Narrated in *Mosnad Ahmad*, and *Saheeh Al-Bukhari*).

vii) **Zulm** (tyranny)

Quran 2: 148,193 "Inspired to strive together toward all that is good, to eradicate zulm, and to established justice and faith in Allah" .Muslim scientist based on Quranic ethics and foundation is endowed with wisdom, conscience to negate what is evil and focus his attention to what is good. Researches that lead to ecological crises for instant are tyrannical or zulm and therefore should be rejected. By denying this philosophical and ethical foundation of Quran, viewing nature as sacred which originated from God and doing researches that causing chaos and catastrophe to it, only indicates that man is injustice to himself. Al-Attas said :

Thus to the question: "Can one be unjust to one's self?" we answer in the affirmative, and add further that justice indeed begins and *ends* with the self. The Holy Qur'an repeatedly stresses the point that man, when he does wrong, is being unjust (*zalim*) to himself, and that injustice (*zulm*) is a condition wrought by man upon his self.(Al-Attas 1992 : 26).

Bukhari and Muslim narrated from Abdullah Ibn Umar that the Prophet (p.b.u.h.) said:

Oppression (Zulm) will be darkness (Zulumaat) on the Day of Resurrection."
(Bukhari: Kitaab al-Mazaalim, Baab az-Zulm Zulumaat Yawm al-Qiyaamah, Fath al-Baari, 51100; Muslim, 4/1969, Hadith no. 2579).

viii) *Istislah* (public interest)

Quran and Hadith stresses upon the *istislah* as the main concern. The whole universe of Quran talks about man as a central theme and nature as his accompaniment. Muslim scientist should direct his scientific researches not just for the sake of science itself or for self-glorification but must have the intention to gain mercy and grace from God through his service to mankind and nature. "*Istislah*, with its wider dimension ensure that knowledge is pursued to promote universal equity, individual freedom, social dignity and values that enhance the well-being of Muslim society and culture". (A. Rashid Moten 1994 : 141).

In Islam whatever methods or means used to save a life is a much praiseworthy work, however an unjust killing of a man is much abhorred. " Because of that We ordained for the Children of Israel that if anyone killed a person not in retaliation of murder, or (and) to spread mischief in the land - it would be as if he killed all mankind, and if anyone saved a life, it would be as if he saved the life of all mankind. and indeed, there came to them Our Messengers with clear proofs, evidences, and signs, even then after that many of them continued to exceed the limits (e.g. by doing oppression unjustly and exceeding beyond the limits set by Allah by committing the major sins) in the land!. (Al-Maeda (5): 32).

viii) *Dhiya* (waste)

Quran addresses Muslims as a *ummatan wasatan* (community of the middle path) which does not involved in extremism and over indulgence which eventually leads to wastage or dhiya. Researches that leads to tyranny such as environmental destruction and dehumanization are categorized as dhiya. Muslim scientists should not waste their energy and resources in acquiring things that doesn't leads to the betterment of humanity and nature. Here is a sample of those Quranic and Hadith commands :

Eat of their fruit when they ripen, but pay the due thereof (its Zakat, according to Allahs Orders 1/10th or 1/20th) on the day of its harvest, and waste not by extravagance. Verily, He likes not Al-Musrifoon (those who waste by extravagance),(Al-Anaam,(6):114).

Narrated Al-Mughira bin Shu'ba: The Prophet said, "Allah has forbidden for you, (1) to be undutiful to your mothers, (2) to bury your daughters alive, (3) to not to pay the rights of the others (e.g. charity, etc.) and (4) to beg of men (begging). And Allah has hated for you (1) vain, useless talk, or that you talk too much about others, (2) to ask too many questions, (in disputed religious matters) and (3) to waste the wealth (by extravagance).

Application of Research Methodology in Islamic Civilization

Ilm (knowledge) forms the foundation for the various scientific methodologies expounded in Islamic civilization and the end products of scientific works that being cultivated and produced.

“In numerous verses in the Qur’an man is directed to the phenomena of nature and asked and even ordered to study them. There is in fact a very rich Qur’anic vocabulary relating to the study of the phenomena of nature. Such verb as *yara’*, *yafqahuun*, *yatadhakkarun*, *ya’qiluun* and *ya’lamuun*, are used in different verses with different meanings, alluding to the level and depth of understanding the phenomena of nature. There is implicit in the Qur’an hierarchy in studying and understanding nature. There is not just one level of knowing or one science of nature but many, ranging from simple observation related to seeing (*ru’ya*) to intellection (*ta’aqul*) and in-depth knowledge of the essences of things (*‘ilm*), which must not under any condition be confused with simple ratiocination anymore than one can simply identify Qur’anic ‘ilm with modern science, a sin of which many modern Muslim thinkers are guilty (Muzaffar Iqbal 2007 : 44-45).

In Islamic Science, therefore, the conclusions drawn must be consistent with the teachings of Islam. The holy Quran does provide useful hints here but urges the man to use his intellect, reflect upon it and try for the comprehension of the harmony, balance and order in the universe so that ultimately he can realize the various attributes of Allah. Thus any conclusion that does not confirm to this avowed objective will not be acceptable (Rais Ahmad 1994 : 248).

Prof Nasr's pioneering works on Islamic science, is that there is no single method which is used in that science to the exclusion of other methods. In Islamic science, different methods applied in accordance with the nature of the subject in question and modes of understanding that subject. Prof Osman Bakar, said "Muslim scientist, in their cultivation and development of the various sciences, have relied upon every avenue of knowledge open to man, from ratiocination and interpretation of sacred scriptures to observation and experimentation"(Osman Bakar 1991 : 15).

Ibnu Sina in his *Isharat wa'l-tanbihat* asserted that true science is that sciences which seeks the knowledge of the essences of things in relation to their origin. It is this active mind of Muslim scientists, or intellectual intuition is required in studying nature to come to the final conclusion of the Unity of God.

So *ilm'* in the real meaning going back to the origin of things, in understanding the Originator Himself. To attain this level of *ilm'* or intellectual intuition Muslim scientist have to submit whole-heartedly to the revelation of God. Intellectual intuition, says Schoun, demands the submission of all the powers of the soul to the pure Spirit which is identified ontologically with the fundamental dogma of revelation (F. Schoun 1969: 76). Submission to the God with complete surrender to His will opens up in Muslim mind and heart to gain scientific knowledge not only in physical level but most importantly its metaphysical aspects, to arrive at a better knowledge of Divine wisdom.

"The Muslims were drawn" said Professor Nasr (2007:89) "to the study of mathematics from the very beginning to a large extent because of the "abstract" nature of the Islamic revelation and the

love that Islam created in the minds of its followers for the doctrine of unity and for a vision of the universe understood mathematically as mathematics is understood in the traditional sense of the term". He continues, "That is why the Muslims made a remarkable contributions to many domains of mathematics"

Muslims incorporated various scientific achievements by different cultures and civilizations and accepted and synthesized in according to the Islamic epistemology. Arabic numerals which was primarily derived from the Indian *Sanskrit* numerals. Muslims contributed in various branches of mathematics such as arithmetic's, geometry and trigonometry. "In fact they further developed plane and solid geometry and systematized mathematical equations for the solutions of many geometry problems, creating a relationship between algebra and geometry which was to be pursued later by Descartes and which became one of the most important elements in the development of modern mathematics" (Nasr 2007).

In the field of trigonometry, it was the Muslim mathematicians who for the first time systematized the six trigonometric functions which to this day bear the mark of their Arabic origin in the Western languages, the word sine been a translation of *jayb* from Arabic (*sinus* in Latin meaning literary pocket or cavity which is what *jayb* means in Arabic) (Nasr 2007).

"The Algebra of Khayyam is one of the most outstanding mathematical texts of the medieval period. It deals with equations through cubic order, classifying and solving them (usually geometrically) and always preserving the relation between the unknowns, numbers and geometrical forms, thereby maintaining the link between mathematics and metaphysical significant inherent in Euclidean Geometry" (Seyyed Hossien Nasr 1984 : 160)

The Brethren of purity (*Ikhwan al safa*), a group of Muslim scholars in the 10th century produced a compendium of the arts and sciences in fifty two epistle. Again Divine unity is the central foundation, numbers and mathematics being viewed in the dimension of attaining and affirming His unity. "The science of number is the "root" of the sciences, the foundation of wisdom, the source of knowledge, and the pillar of meaning. It is the First Elixir great alchemy...." (Nasr 1984: 152)

For brethren of purity, “the whole world is composed in conformity with arithmetical, geometrical and musical relations”. (S.H. Nasr 1978: 45)

For Muslims mathematical contents of the universe studied in both its qualitative and quantitative aspects, not just in a pure quantitative aspect alone.

Again to quote from their writings how the entire numbers reflected as symbols leading one to affirm to His unity “Know, oh Brother (May God assist thee and us by the Spirit Him) that God, Exalted Be His Praise Be His Praise, when He created all creatures and brought all things into being, arranged them and brought them into existence by a process similar to the process of generation (of numbers) from one, so that the multiplicity (of numbers) should be a witness to His Oneness, and their classification and order an indication of the perfection of His Wisdom in creation. And this would be a witness to the fact, too, that they (creatures) are related to Him who created them, in the same way as the numbers are related to the One which is prior to two, and which is the principal, origin and source of numbers, as we have shown in our treatise on arithmetic.” (S.H Nasr 1984: 155-6).

In the field of zoology, for instance, Muslim scientists made an in-depth study of various aspects of animal from anatomy, habitats to classification of animals. But their interest is not only in practical concerns, such as medical use of animals but importantly their major concerns was the spiritual and moral significance of animal which reflected in their study of animal psychology and how it was displayed in a literary and moral form. Al-Jahiz, the 9th century author of *The Book of Animals*, has treated zoology as a branch of religious studies. His main aim in studying zoology is to demonstrate the wisdom inherent in His creation and the existence of God. Prof Osman Bakar in his book *Tauhid and Science* (1991) have summarized the primary aim of a Muslim zoologist or scientist in dealing with his subject of studies:

From the Islamic point of view, a true zoology or science of animals only emerges when all of these different aspects of animals are taken into consideration. There is unity of scientific and spiritual knowledge in this conception of zoology. The link between the two types of knowledge is preserved not only in zoological works but also in works of

art. Muslim artists drew miniatures of various species, which successfully captured the inner qualities of these animals. By virtue of the link that exists between the inner qualities of animals and the spiritual world, these works of art serve a kind of spiritual function, namely to enable man contemplate the visible world as a reflection of the spiritual world.(Osman Bakar 1991 : 70)

“It is precisely the “domination of nature’ that has caused the problem of over-population, the lack of ‘breathing space’, the coagulation and congestion of city life, the exhaustion of natural resources of all kinds, the destruction of natural beauty, the marring of the living environment by means of the machine and its products, the abnormal rise in mental illnesses and a thousand and one other difficulties some of which appear completely insurmountable”. (Nasr, 1976: 18)

Conclusion

God created man not in sport or in vain but He has endowed him with the senses, with reason and understanding, made him perfect-indeed, breathed into him of His spirit (Qur’an 15:29). Man in Islam is the ‘crown of creation’ having a great responsibility or duty before the God, a servant/slave of God (abd-Allah) and vicegerent of God (Khalifatul-Allah).

Such a great duty, said Ismail al-Faruqi, an eminent Islamic Scholar, is the cause for creation of man. It is the final end of human existence, man’s definition, and the meaning of his life and existence on earth. By virtue of it, man assumes a cosmic function of tremendous. The cosmos would not be itself without that higher part of the divine will which is the object of human moral endeavor. And no other creature in the cosmos is known who can substitute for man in this function. If man is said “the crown of creation,” it is certainly on this account, namely, that by his ethical striving and action, he is the only cosmic bridge through which the moral and hence higher part of the divine will enters the realm of space-time and becomes history.(al-Faruqi 1992 : 62).

“*Al-taklif*” said Prof. Ismail-Al-Faruqi (1992) “laid down man exclusive knows no bound , as far as possible scope and theater of action. It comprehend the whole universe. All mankind is object of man’s moral action: all earth and sky are are his theater, his *materiel*. He is responsible for all

that take place in the universe, in every one of its remotest corners, for man's *taklif* is universal, cosmic. It comes to end only on the Day of Judgement." (Al- Faruqi 1992 : 62)

A Muslim scientist needs to understand that he was created by God in a best of stature (*ahsan al-takwim*). Therefore he has all the capacity and capabilities to perform the best of his ability for the betterment of himself and others. He should be creative and energetic as the Prophet (PBUH) have said "work as if you will be living a thousand years and pray as if you will be dying tomorrow", and that at the same time having a constant consciousness about his weaknesses, his need of Him and a deep believe that the effort and work endeavored will only be materialized if He wills. Therefore he has a free will to work with his full capabilities and at the same time he's constantly in need of Him, seeking His grace and His acceptance.

Islam has always stressed the importance of man being the custodian of nature and not to destroy it for self-satisfaction but rather to live in it with peace. And he has to beware that if he seeks to destroy nature and annihilate it he will eventually fail and the final word is always belongs to the nature. In this perspective an Islamic scholar Eaton (1985) has wonderfully summarized it: "We must tread carefully upon earth, treating it with the same respect that we show to the Book of Allah, for although 'He hath made the earth humbled to you', and although we are free 'to walk in its tracts and eat of His providing,' yet: "Are ye assured of Him that's is in heaven that He might not cause the earth to swallow you? For behold! The earth is quaking"" (C.G. Eaton 1985: 91)

Finally, only through ethical foundations that have been expounded in the Qur'an and Hadith can man truly find the 'true science' he's striving for and the salvation he's hoping for. "It is only tradition that can convert man from his role of plunderer of the earth to that of the 'vicegerent of God on earth' (*khalifat Allah fi'l-ard*)" (Nasr 1980: 154). Only a man who's endowed with the true vision of nature, the inner dimensions of it, will be able to fulfill the covenant he has made with his God, to love the nature and the universe and be the vicegerent of God. His love of the

universe will be as the famous line of the Sufi Saint Sa'di: "I am in love with the whole Universe because it comes from Him". (Nasr 1980: 142).

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