The Limitations of Science and the Teachings of Science from the Islamic Perspective

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What is Science?

In Latin "Scientia" means "knowledge." So science is defined as all the knowledge men have achieved in different places and at all times, arranged according to their subject-matter. This includes knowledge gained through Divine revelation; or by the way of human thinking and creative intellect, as well as through human legacy and tradition in these two areas. The prevailing direction, however, tends to limit the term Science to natural and experimental studies of all that is within reach of the senses and intellect in this universe (i.e. matter, energy, living beings and natural phenomena). This is usually carried out through observation and conclusion or through experimentation, observation and conclusion, in an attempt to discover the characteristics of matter, energy and living things, classify all these and discover the laws governing them. As thus defined, Science also includes deductions, suppositions, hypotheses and theories which are put forward to explain prevailing phenomena.

This definition has limited Science to "a branch of study which is concerned either with a connected body of demonstrated truths or with observed facts systematically classified and more or less collated by being brought under general laws, and which includes trustworthy methods for the discovery of new truth within its own domain."

Accordingly, human knowledge has been divided into scientific studies (both pure and applied), literary and art studies and religious studies (studies of faith). Writers, however, differ much in classifying and chaptering human knowledge, but the following classification seems appropriate:

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- Islamic Studies
- Philosophy (General Philosophy)
- Humanities and Social Studies
- Philosophy of Sciences
- Pure and Applied Sciences
- (Cosmic Sciences, Sciences of the universe).

In each of these major divisions of human knowledge, the interaction of all information available to man—whether acquired (through direct observation of the universe or through experimentation, observation and conclusion), or donated (through Divine revelations in the Qur'aan and the Sunnah of the Prophet (SAA) has to take place, intelligently and truthfully, without undue, forcing of conclusions. If this does not take place, human knowledge can remain partial, and such partiality can be further magnified by the current trend of overspecialization, flood of literature, secularization and separation of gnosis from wisdom.

Scientific Procedure and the Limitations of Science

Science as thus defined necessitates a mass of organized objective observations which are gradually recorded with time, and repeatedly examined by trained minds to put forward the necessary theories to explain such observations and arrive at the laws that govern them. This can be fulfilled by repeated experiments until their truth in explaining observations gathered directly from the universe or through experiments designed to reach a number of conclusions. This necessitates the proposition of hypotheses and the formulation of theories as part of logical reasoning aiming at knowledge. Despite the fact that the scientific method puts man directly in contact with the universe which has been created with deep knowledge and careful planning under eternal divine laws. And despite the accepted precision of scientific procedure, yet it has its own limitations. The limitation of experimental science can be demonstrated by the following points:

1. However direct the observation or the experiment and observation might be, it is no more than an outward appearance of the actual truth and not the truth itself. There is of course a great difference between being aware of things and knowing their actual truth. The former is limited to sensible events only while the latter is beyond the capacity of our senses. It is not more than a facade behind which truth exists.

The object to be studied may be fully or partly observed, or not observed, but sensed through some effects perceived through repeatable experiments. The conclusions derived from partial or complete observation are classified under what is known as the "exact readings, data or information." These are mainly manifested through human senses, which are proved by experimental science itself to be very much limited. Because of this, the human mind often

tried to support its senses through various technical appliances devised on the basis of what man has known about the laws of matter and the characteristics of living creatures. With the help of such devices, we can detect things in the universe which our naked senses cannot. But these instruments, however complicated they may be, remain merely devices that help human senses to perceive at a distance. Their readings are remote sensing of evidence of truth and not the truth itself.

2. There are things in the universe which cannot be felt by human senses either directly or indirectly. These can be detected, however, by the existence of evidence for a logial presumption which is sufficient to prove the claim of its existence. This is known as scientific deduction or *a priori* reasoning and is an acceptable means in the process of scientific conclusion if it is based on logic. Not only this, but deduction may sometimes be nearer to the truth than sensual observation, because truth is holistic, while observation is partial. Hence, major conclusions normally start where limited information derived from sensual observation ends. Here emerge other limitations for experimental science, represented in the limits of the human mind and its ability for correct deduction.

3. Science comprises both sensual and non-sensual information, the latter is known as "scientific abstraction" or "higher truth" which is a common ground for science, philosophy and religion. Here, the different branches of human knowledge should interact to understand the universe and its governing laws.Each, via its own means, should look for judgements through which it can fully explore the universe and exploit its resources, understand its creation in general, and the creation of man in particular, his message in this world, and his destiny after it, etc. Such questions are reiterated in every human mind whatever his culture and his specialization may be, and in the largest majority of cases, man cannot arrive at conclusive answers to such questions through his individual effort. This is simply because of the fact that man's observations and measurements are limited to the outer appearances of things in this universe, masked by the limitation of his senses and the relativity of his space and time. However exact his measurements and deductions might be, all that is proved by them may be false as well as true. To accept a measure as correct does not necessitate that we should accept what it yields. Accordingly many higher truths cannot be reached through human thinking alone or via his limited methods of scientific research. We have no means of knowing such higher truths except through Divine revelation. Here man shifts from the orbit of science and philosophy to that of religion, which if correct, is the highest level of human knowledge.

4. By nature of man's limited existence in space (on this tiny planet Earth and for a very limited period of time represented by his average age) and the limitations of his senses in both space and time, all his conclusions become

only relative. This makes the results of pure and experimental sciences nothing more than the outward appearance of truth as man can see it from his position in the universe and in the very limited time allocated to him, and not the truth itself. It also makes scientific theories only working hypotheses, even the ones based on direct observation and experimentation.

5. Man's ability to know a number of universal laws in spite of the limitations of his senses and abilities and the relativity of his place and time points to the perfect structure of this universe and the perpetuality of its laws. In their study of the universe through close observation and testing and then applying their intellectual powers to such observations and tests, scientists take the universe with all its components of matter, energy, phenomena, laws and creatures as their instructor.

6. Due to the continuously expanding range of science, it has become impossible for an individual to grasp all branches of knowledge, nor even to have a full grasp of one branch. Hence man is obliged to specialize in small sectors of the spheres of knowledge which have become almost countless. Even in the very narrow specialization, it has become difficult for any individual to have a comprehensive grasp of everything, and the current trend is generally towards increasing the narrowness and depth of specialization. This has made the results of experimental science very partial, and as partial information cannot answer man's comprehensive inquiries, his need for a greater and more comprehensive knowledge is confirmed.

7. Science bears the stamp of its intellectual and social milieu. In every sphere of knowledge man's grasp and output vary according to his cultural background, up-bringing and mental as well as psychological conditions. Thus major scientific conclusions are sometimes defined as a mental and psychological state through which man sees the world around him, and as these are ever-changing throughout one's life, his grasp and creativity will differ accordingly. This confirms the limitation of human writings in general and the scientific ones in particular, especially in its generalizations.

8. The ever-increasing knowledge about the universe, and our obvious need to revise it continuously in the light of new discoveries, and to amend, develop or drop some parts of it, is clear evidence about the incompleteness of science and the limitation of its methods.

9. One working in the scientific field usually inherits a large load of ready-made thought which one cannot thoroughly scrutinize. Consequently, one's contribution cannot represent but a small portion of an ever-increasing amount of knowledge, based fundamentally on imitation. Hence, science, in addition to its preoccupation with the present and the future, does not neglect scientific achievements of the past. Otherwise it will not fulfill any degree of progress. That is why reviewing the scientific literature, criticizing and developing it is a fundamental part of science. A scientist cannot contribute in any

field without prior knowledge in general, and science in particular, for over ten centuries to become the basis of current scientific and technological advances. History can also portray the amount of illusion and misguidance contemporary scientific writings can lead to since they have been snatched from the hands of Muslims and written from a secularist point of view. Such allegations are all non-scientific and untrue. They are a natural outcome of the fact that modern science (when moved from Islamic Andalusia to Europe) has developed in an atmosphere of outraged hostility towards Christianity, in particular, and religion, in general. In this process modern science has acquired a negative attitude towards belief and has limited its course and style to another direction. This has been supported by the anti-religious stand in the Communist world and the retreat of contemporary Muslims from their leading positions, particularly in the area of science and technology. Added to these, one cannot overlook the activities of the varied evil forces, interests and affiliations directed toward strengthening secularism by numerous material philosophies, information, campaigns, extremist racial and political movements, destructive social associations, obvious and underground military and semi-military actions which all aim at annihilating religion and the sovereignty of secular thinking over all aspects of life.

Science itself could not correct its path due to the simple fact that with its continued expansion, its fields of specialization are continuously narrowing, which makes it difficult for the specialist to form the comprehensive view that is necessary for such a correcting process. Consequently science is still written from that very approach, despite its huge achievements. This has caused great harm to both science and humanity, because keeping scientific writing to the material side only resulted in confining it within the cycle of human senses. This is the smallest circle of knowledge in our universe. Knowledge is metaphysical in many of its aspects and this cannot be completely subjected to scientific procedure. Our senses can only feel and understand the outer appearance of things as seen within the limits of our time, place, abilities and the nature of our bodies. When scientific thinking imprisoned itself within the purely material framework it could not enter wider and more comprehensive areas.

Consequently, scientific contributions have fallen short of many objectives which science could have reached if it had not limited itself to a materialistic paradigm. In its essence, science is a method of knowing the truth, while matter is only a small portion of that truth. Scientists have thus been put on a closed path when they decided to keep their conclusions within the limits of matter, and were led to many erroneous conclusions such as:

(*a*) The false claim of the eternity of matter and energy (that both matter and energy can neither be annihilated nor created from nothing), and hence the alleged eternity of the universe and negation of creation.

(*b*) The wrong reference of everything in this universe to nature and its laws (without a logical definition of nature) and the consequent refusal to relate anything in it to a supernatural power, and hence the unfounded refusal to believe in the Creator.

(*c*) The erroneous explanation of the graduality of life on earth with time as a material proof for spontaneous evaluation without the need of a creator (the evolution of elements, chemical evolution, organic evolution, mental evolution etc.). This was wrongly taken as a basis for the false allegation that creation took place by random co-incidence in order to negate wisdom, design, aim and objectivity.

Such mistaken conclusions have been used as a basis for numerous materialistic philosophies which ignored religion and rejected its bases (the belief in God, His angels, His books, His apostles, and the life Hereafter) as well as all the moral bindings and ethics it teaches.

These erroneous conclusions have changed our time (which is characterized by scientific and technological achievements with no parallel in human history and by a real explosion of knowledge) into an age of anxiety and unrest, moral decay and loss of identity, psychological upsets and mental disturbances. It is the age of stockpiling the most sophisticated of armaments (e.g. biological, chemical, nuclear, etc.) and carriers and launching devices. It is the age of hunger and drought, the age of irrational depletion of the earth's resources, pollution of its environment and degeneration of its inhabitants (as individuals, families and societies). In brief, it has become the age of material, psychological and spiritual crises which alienated man from both his integrity and destined mission in this world and transformed him into an egoistic being that cares less about anything beyond his limited needs in this worldly life.

We, in the Muslim world, could not in any case keep away from that turmoil, because in an attempt to catch-up we have been eagarly sending our students abroad where they are severely subjected to endless challenges. We have also been copying the alien scientific writings with all their good and bad, and all their materialistic agnostic background. It is enough to mention that in the contemporary Muslim world, the number of Muslim students abroad has been lately exceeding hundreds of thousands and that the majority of sciences are still being taught and published in foreign languages, on exactly the same pattern of imported writings. Even what is published in Arabic or in local languages of other Muslim countries, is in the majority of cases a direct or indirect translation of the alien thoughts, and hence no wonder that it does sometimes contain clear contradictions with basic beliefs. This can create confusion in an age of great fascination with science and technology.

Some individual efforts, however, to write science from a true believing perspective have emerged like the writings of the following professors: Ibrahim Farag, Muahmmad Ahmad El-Ghamrawi, Muhammad Mahmound Ibrahim,

Khattab Muhammad, Malek bin Nabi, Waheed-uddin Khan, Muhammad Said Kira, Ahmad Abdis-slam El-Kerdani, Muhammad Jamaluddin El Fandi, Abder Razzak Nawfal, Ahmad Zaki, Hanafi Ahmad, Mustafa Mahmood, Khales Konjo, Hasan Zeino, Afeef Tabbarah, Qais Al Qirttas, M. Ferdouse Khan, M. M. M. Qadri, A. Q. Chowdhury, M. Akbar Ali, Maurice Buccaile, etc. (among the Muslim writers), Sir James Geans, A. Cressy Morrison, Alexis Carel, Graham Cannon and Albert Einstein (among foreign writers). This is in addition to forty other American specialists whom Dr. John Clover Monsma asked to write, for a book he published under the title, "The Evidence of God in an Expanding Universe," which has been translated into Arabic by Dr. Ab-Dimirdash Abdel-Majeed Sarhan, and revised by Dr. M. J. El Fandi.

These writings are mostly general scientific writings or philosophical ones, far from scientific teaching or research work. Here the book of Professor Dr. Ibrahim Farag in the field of "Earth Sciences" and that by Dr. Khales Kanjo in medicine (the former being a university text-book and the latter a Ph.D. thesis) have emerged as pioneering works on the path of rewriting science from the Islamic point of view. The writer has also pursued this goal by writing a book on Historical Geology entitled "Images from Pre-historic Life." Aside from such exceptions, the science writings in our hand whether text-books, reference books, periodicals, circulars, films etc. are all written from a purely materialistic outlook which disapproves or at least overlooks all that is super-natural. Hence they are full of erroneous expressions levelled against both science and belief.

Broad Lines for Rewriting and Teaching Science from the Islamic Perspective

It is clear from the above mentioned discussion that scientific writings published during the last two centuries were written mostly from a purely materialist background. Such a trend in scientific writing started as a challenge to the Church in a revolution against its attempts to constrain human thinking. This has gradually become the rule, however, to the extent that most scientists indulge in such erroneous writing without really understanding what it is leading to. Accordingly scientific victories were wrongly considered victories over religion, and were used as tools to demolish it instead of emphasizing the fact that science is one of the short-cuts for one to get acquainted with the marvels of the Great Creator.

As human knowledge is the heritage of all humanity, and as Muslims are the middle nation and the trustees of the last heavenly message, it becomes incumbent upon them to purify all knowledge and particularly science from biased ideas based on erroneous historic stands, human distortions or misconceptions. The accumulated errors that had – in the past – shifted science

and scientists from the domain of belief to that of disbelief are becoming obvious, even to non-Muslims. This is definitely one of the numerous reasons that are currently driving a large number of non-Muslims to Islam. Muslims therefore should take the initiative and advance to rewrite science and teach it from the Islamic perspective. Here are some broad goals for achieving this purpose:

1. Stress the value of science and of scientific investigations in Islam. Indeed the Holy Qur'an has perpetually and in more than 750 verses, directed the human beings to look through the universe and try to understand its miraculous build-up, because by so doing one can get to know one's Creator, can understand the laws governing the universe and hence use it for bettering life on earth.

2. Point out the greatness of the universe and of everything that is in it (matter, energy, nutural phenomena, plants, animals, human beings, etc.) and emphasize that such an intricate and vast universe could not possibly have made itself, but needs a single creator. It could not have been the outcome of either chance or chaos, because the mathematical probabilities for the creation of the universe by chance are almost nil. This clearly proves that our universe must have been created by the predetermined, very well-planned wisdom of a Supreme Being that has always been looking after it. Naturally, the qualities of the Supreme Being are beyond the abilities of the human brain to comprehend, and are definitely not in any way comparable to anything in His creation.

3. Emphasize the fact that the universe is actually built on the same basis from its minutest units to its largest ones, and that its basic elements matter, energy, space and time are interchangeable and interconnected. This pushes the observable components of our universe into one thing which we have not yet been able to know, but which represents the unity of the universe. If this points to anything it must point to the oneness of the Great Creator.

4. Emphasize the fact that our universe is not eternal, as it had a beginning which scientists have been trying to estimate, and it will definitely have an end as indicated by the observable changes in it. These facts have been repeatedly proved through different scientific disciplines, but have been always overlooked and neglected.

5. Point out that science, in its restricted definition, is a human attempt to explore Allah's creation in the universe and discover the laws that govern them. By discovering cosmic phenomena and the Divine laws that govern them man can make use of it in bettering his life, and this ia a major part of his mission on earth.

6. Stress the fact that science is basically a human attempt for reaching the truth. In so doing, it necessitates honesty, sincerity, willingness, devotion and precision. If armed with these qualities, scientific endeavors are considered

in Islam a holy act for which a Muslim will be rewarded.

7. Emphasize the fact that experimental science represents only partial knowledge, which is becoming more and more partial with over-specialization. Despite its great value such partial knowledge cannot answer the major queries of the human mind. Such major queries need more integral and encompassing knowledge. This can only be given by the Creator, and hence the need for Divine revelations.

8. Stress the fact that experimental science itself proves the existence of the unseen. Most of the recent discoveries were not known before and hence were part of the unseen for previous generations. It is running after the unknown that helps science to develop.

9. Point out the fact that experimental science cannot recognize the essence of life. It only studies its phenomena. We currently know the detailed chemical composition of the living cell, but we could not make it.

10. Emphasize the fact that science itself proves the possibility, indeed the necessity of revelation, destruction of this world, resurrection, and accountability.

11. Point out the Qur'anic verses of a scientific nature which have been counted to be more than 750, with the clear understanding that the Qur'an is basically a book of guidance, not a book of science. Yet, the precedence of the Qur'an, fourteen centuries ago, with scientific notions and facts that were only discovered a few years ago is, in itself, a clear proof that it is a Divine revelation. Such verses must be thoroughly studied, understood in the light of the most recent scientific contributions, commented upon and used wherever adequate in our scientific writings, without undue forcing. These could be landmarks for future discoveries as they are signs from Allah, the Creator of everything, and would be clear evidence for guidance in a world fascinated by the contributions of science.

12. Stress the fact that the human brain, senses and other faculties represent one of the greatest gifts of Allah to man. To express our appreciation for such gifts, one has to use them to their capability. The Qur'an states that one is accountable for his senses.

13. Point out the contributions of Muslims to the fields of science and technology in particular, and to human knowledge in general. Muslims had a basic role in the advancement of the different branches of knowledge, and these are in most cases overlooked.

14. Stress the fact that Islam is the system of thought and conduct of the whole life of all human beings of all ages, comprehending the whole of life, the entire society and all peoples of all nations and ages. This system has been taught to Adam by Allah, on the very day Adam was created, and thereafter the message of whoever was ordained for the guidance of man in different parts of the world and at different periods was invariably the same

towards which finally Prophet Mohammad (SAA) invited the whole world. It is the only religion acceptable to Allah, and hence human deviations in the name of religion cannot be considered religion. Consequently, the onslaught directed towards religion in non-Muslim countries cannot be applied to Islam.

15. Emphasize Iman by pointing out the signs of Allah in everything in this universe wherever possible and whenever necessary.

16. Refrain from the use of ambiguous, meaningless, omnibus terms such as nature and natural. Such terms were intentionally introduced in scientific writings out of disbelief. A Muslim writer could use the word Cosmos or universe instead of nature. Terms such as natural laws and natural selection should be replaced by Divine laws (or cosmic laws) and Divine selection. By such a minor change, numerous misconceptions could be rectified. Similarly, a Muslim scientist should refrain from using terms such as chance or random when he knows definitely that it is plan and order. He should also refrain from using such wrong expressions as "life appeared or disappeared, developed or evolved," when he deeply knows that it was created and was made to evolve, develop or become extinct by its Creator. Similarly, such misguided slogans as "survival of the fittest," "struggle for existence," "struggle against nature," "invasion of space," etc., should be totally abandoned. These are not only wrong from the scientific point of view, but are direct expressions of human arrogance and conceit.

Consequently, any word or expression that could contradict or cast doubt on a clearly expressed Islamic fact should be deleted. This should be carried out however, in a way that can never interfere with the scientific procedure, or limit the human endeavor to explore the universe.

17. Emphasize the fact that in directing man to scientific research, Islam defies ignorance, fanaticism, wrong inheritance and maljudgement through imagination or personal desires. It always asks for proof and commands the founding of one's judgement on non-refutable logical deductions. In this, Islam has indeed founded the scientific method and its ethics, and experimental science is described to be Qur'anic in its approach.

Summary and Recommendations

Modern science developed in Europe within an atmosphere of outraged hostility against Christianity, and hence has been written from a purely materialistic point of view. This limitation of science to the material substance alone has alienated it from wisdom and has been used to allege that science and its contributions contradict religion and refute its teachings. Such allegations have, sadly enough, been widely accepted in the wave of fascination with recent scientific and technological achievements. Consequently, the advances in the area of science and technology were paralleled by repulsion

of religion, rejection of faith, and revolt over its constraints. This trend has crystallized in a number of materialistic ideologies that emerged as a product of the processes of secularization, and dominated in the absence of the right belief. It has also been aided by the lagging behind of contemporary Muslims, especially in the area of science and technology.

Going back to the roots of the problem one can easily find out that science did clash with Christianity for three basic reasons that can be summarized as follows:

(1) The deviation of Christianity from the basic teachings of Christ (SAA), which has taken it out of its original Divine Framework (Islam).

(2) The infiltration of numerous man-made ideas into both the Old and New Testaments, which have been disproved by recent scientific findings (cf. Bucaille, 1979), and

(3) The wrong stand of the Church on Science and Scientists from their early days in Europe.

If this has been the stand towards Christianity, however, it should not be applied to Islam. Contemporary Christianity is essentially a man-made religion, while contemporary Islam is the integration of the Divine messages to man since the very early days of Adam. Whoever was ordained for the guidance of man in different parts of the world at different periods [e.g. Abraham, Moses, Jesus, etc. (peace be upon them all)] the message was invariably the same towards which finally Prophet Mohammad (SAA) invited the whole world. It is the only revelation within the hands of human beings that has been preserved in the same language in which it was revealed, to the minutest detail, while all the previous revelations have been either completely lost or distorted. An agreement between Islam and Science in the approach, morals, obligations and major conclusions cannot be concealed (cf. Bucaille, 1979). This is simply because science, in its restricted definition, is no more than a human attempt to explore Allah's creation in the universe and discover the laws that govern them. As the Qur'an is revealed from Allah the Creator, there could be no contradiction between it and the laws Allah has placed in His creation. Moreover, the prior revelation in the Qur'an of scientific facts not known to man until fourteen centuries later in this century, is in itself a clear evidence for the Divine nature of the Qur'anic verses (cf. Bucaille, 1979).

Despite all this, science is still written in the Muslim world from the same materialistic attitude of the non-Muslims. As this contradicts both Islam and the current process of Islamic revival, it has to be rectified and science has to be rewritten and taught from the Islamic perspective. In this connection, the following recommendations and suggestions are made: –

1. Revise science text-books that are currently in use in the Muslim World, especially those in the pre-university levels as well as the undergraduate ones, to eradicate all undue un-Islamic or anti-Islamic expressions and/or generalizations.

2. Re-structure curricula and syllabi for writing new science textbooks from the Islamic perspective. These might cover the following major items:

(*a*) Scientific material purified from all non-Islamic and anti-Islamic generalizations and/or expressions, re-written in a modest way without undue presumptions.

(*b*) The spiritual implications of the scientific information (i.e. the wisdom behind it) if clearly understood. These should be mentioned in various forms according to the level of instruction, and should stress, heeding Allah and His Prophet (SAA), the vastness of the universe, its intricate and orderly structure, unified pattern and miraculous build-up, the limitations of science, and the need of human beings for the mercy of Allah throughout their existence.

(*c*) All ethical and moral guidelines that could derive from such information.

(*d*) Relevent Qur'anic verses and/or sayings of the Prophet (SAA) wherever applicable, without undue forcing.

(*e*) Muslims' contributions to the field (past and present).

(*f*) Undiscovered or unexplored areas of the field and motivations for future research.

3. Begin a long-term program to translate the basic books in the different fields of science and technology into Arabic (or the other languages of the different Muslim countries), with comments on any un–islamic expression or generalization. This step should be taken in preparation for the teaching of science and technology in either Arabic or the other mother tongues of the Muslims.

4. Monitor the media (press, T.V., radio, etc.) to identify misinterpreted and mis-figured scientific information.

5. Prepare special science and technology programs for the TV and radio to educate the masses from an Islamic perspective.

6. Encourage scientific and technical research in the Muslim World (in universities, institutes, industrial centers, etc.) on Islamic bases.

7. Minimize the number of Muslim students that are being sent abroad to be educated at the hands of non-Muslims to only the very necessary areas, and to specific ages and specializations.

8. Establish an Islamic organization for science, technology and development to plan for the scientific and technological revival of the Muslim Ummah. The potentials of such Ummah are enormous, but these have been

dissipated by its division into more than 60 nations and minority groups.

9. Besides the World Center for "Islamic Education" in Mecca and the "Islamic Foundation for Science, Technology and Development" proposed to be in Jeddah, an "International Union for Muslim Scientists and Engineers" (with headquarters and offices in different countries) is deemed necessary for the promotion of the scientific and technical revival of the Muslim Ummah through various activities including statistical studies, surveys, publications, conferences, etc. This union should include "International, Specialized, Islamic Societies" in the different disciplines of science and technology, which would exercise their activities independently as well as within those of the "International Union" (e.g. publications, meetings, etc.).

10. In addition to the above mentioned organizations, the "World Center of Islamic Education" should encourage the rewriting and teaching of Science from the Islamic perspective by drafting the broad lines for both the necessary curricula and syllabi as well as the guidelines for text-book writing. The center could then invite committed specialists to write the necessary books for the different levels of education in an open competition. The manuscripts should be critically reviewed, and the best ones adopted. This may necessitate the establishment of committees that include specialists in pure and applied sciences, philosophy and Islamic studies for proper assessment of both the curricula and syllabi and for judging the manuscripts.

11. Promote science and technology in the Muslim World through various incentives such as the establishment of annual prizes, awards, and other honoraria.

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Selected References

Adler, Irving (1962): "How Life Began": Signet Science Library Books, Second Printing, The new American Library of World Literature, Inc., New York.

DeBeer, Gavin (1970): A Handbook on Evolution: Brit Mus. (Nat. Hist), London (4th edition Public. No. 685).

Bernal, J.D. (1949): "The Physical Basis of Life": Routledge and Kegan Paul, London.

Bernal, J.D. (1967): The Origin of Life: World Publishing Co., New York.

Brodrick, A.H. (1960): Man and His Ancestry: The Scientific Book Club (London).

Bucaille, M. (1979): The Bible, the Quran and Science, American Trust Publications, Indianapolis, Indiana, U.S.A.

Calvin, Melvin (1979): Evolution: Molecular Evolution Towards the Origin of Living System on the Earth and Elsewhere: Oxford at the Clarendon Press (Oxford).

Cannon, A. Graham (1958): "The Evolution of Living Things", Manchester University Press.

Chadrin, Pierre, de (1969): Comment Je Crois: Editions du Seuil (Paris).

Corvez, Maurice (1970): Dieu est-il mort.? Response des theologiens: (Aubier-Montaigne, Paris).

Crick, F.H.C. (1966): Of Molecules and Men, University of Washington Press.

Darwin, Charles (1960): The Origin of Species by Means of Natural Selection or the Preservation of the Favoured Races in the Struggle for Life: with an Introduction by Julian Huxley: A Mentor Book, Published by the New American Library of World Literature, New York; 4th Printing (First edition 1859).

Dubarle, D. (1967): Approaches d'une theologie de la science. Les Editions du CERF (Paris).

Duquesne, Jacques (1968): Dieu pour l'homme d'aujourd'hui, Bernard Grasset (Paris).

Eaton, T.H., Jr. (1970): Evolution, Thomas Nelson and Sons Ltd. (London).

Ehrensvard, G. (1962): "Life: Origin and Development", University of Chicago Press.

Einstein, Albert (1950): Out of My Later Years, Constable.

Einstein, Albert (1960): Relativity: The Special and the General Theory, University Paperbacks 10, Methuen (London) (translated by R.W. Lawson).

El-Fandy, M.J. (1967): On Cosmic Verses in the Quran: Studies in Islam series No. 5, the Supreme Council for Islamic Affairs, Cairo, U.A.R.

Farrer, Austin (1966): A Science of God? Geoffrey Bless (London).

Ford, E.B. (1960): Mendelism and Evolution, Methuen and Co. Ltd. (London). John Wiley and Sons Inc. (New York) (Seventh edition, revised).

Fox, S.W. (Editor (1965): The Origins of Prebiological Systems and of their Molecular Matrices, Academic Press, New York.

Gamow, G. (1959): Biography of the Earth: Its Past, Present, and Future, Macmillan and Co., Ltd. (London) (Revised Edition).

Geans, Sir James (1930): The Mysterious Universe, Cambridge University Press.

Haldane, J.B.S. (1933): Science and Human Life, Harper Brothers, New York.

Haldane, J.B.S. (1954): "Origin of Life", New Biology, No. 16, Penguin Books, London.

Hathout, Hassan and Nosseir, A. (1975): "Islamic Aspects in Gynaecology and Obstetrics" in "Gynaecology and Maternal Care", Health Supervisors Institute, Ministry of Education, Kuwait.

Hurley, Patrick M. (1965): "How Old is the Earth?", The science study Series, No. 5, Heinemann (London).

Jarman, Catherine (1970), "Evolution of Life", Hamlyn (London).

Jukes, Thomas E. (1966): "Molecules and Evolution", Columbia University Press, New York.

Kenyon, Dean H. and Steinman, Gary (1970): "Biochemical Predestination", McGraw Hill, New York.

Keosian, J. (1968): "The Origin of Life", 2nd edn., Reinhold, New York, Chapman and Hall Ltd., Publishing Corporation, London (First edn. 1964, reprinted, 1965).

Kurten, Bjorn (1972): "Not From the Apes" (Man's origins and evolution), Victor Gollancz Ltd., London.

Matson, Wallace I. (1967): "The Existence of God," Cornell University Press (Ithaca, New York), third edition.

Monsma, John Clover (Edit.) (1958): "The Evidence of God in an Expanding Universe": Forty American Scientists declare their affirmative views on relition). (Published in connection with the International Geophysical Year) G.P. Putnam's Sons (New York), Longmans, Green and Co., (Toronto).

Morrison, A. Cressy (1944): "Man Does Not Stand Alone"; (seven reasons) why a scientist believes in God). Fleming H. Revell Company, Second Edition (1962) by the World's Work Ltd., Kingswood, Surrey.

Olson, E.C. (1966): "The Evolution of Life": A Mentor Book, The American Library (New York and Toronto), The New English Library Ltd. (London).

Oparin, A.I. (1938): "The Origin of Life on Earth" (trans. by S. Margulis), MacMillan, New York.

Oparin, A.I. (1957): "The Origin of Life on Earth" 3rd Eng. edition, trans, by Ann Synge, Oliver and Boyd, (London), Academic Press (New York).

Oparin A.I. (1962): "Life: Its Nature, Origin and Development", Academic Press (New York).

Oparin A.I. (1964): "The Chemical Origin of Life"; Translated from the Russian by Ann Synge, Charles C. Thomas, Springfield, Illinois, U.S.A.

Rutten, M.G. (1962): "The Geological Aspects of the Origin of Life on Earth", Elsevier, Amsterdam.

Shapley, Harlow (1959): "Of Stars and Men", Beacon Press, Boston, Mass.

Simpson, George G. (1967): "The Meaning of Evolution: a Study of the History of Life and its Significance for Man", Revised edition, Yale University Press, New Haven.

Thesmontant, Cluade (1967): "Comment se pose aujourd'hui le Probleme de l'existence de Dieu?, Editions du Seuil (Paris).

Wooldridge, Dean E. (1966): "The Machinery of Life", McGraw-hill, New York.

ـــ ابراهيم ، محمد محمود (١٩٧٢): ''اعجاز القرآن في علم طبقات الأرض، ـــ من نشرات اتحاد الطلاب بكلية الهندسة ـــ جامعة أسيوط (مطبعة قاصد خير ـــ القاهرة).
ـــ أبو خليل، شوقي (١٩٧٠): ''الانسان بين العلم والدين'' ـــ مطبعة الانشاء (دمشق).
ـــ أزيموف، أسحق (١٩٦٥): ''الحقيقة والخيال'' ـــ ترجمة د. محمد جمال الدين الفندي، د. جابر عبد الحميد جابر ـــ (دار المعارف بمصر).
ـــ الجسر، الشيخ نديم (١٩٦٣): ''قصة الايمان بين الفلسفة والعلم والدين'' ـــ دار الأندلس (الطبعة الثانية).
ـــ أحمد، حنفي (١٩٥٤): ''معجزة القرآن في وصف الكائنات'' الجزء الأول عن الخلق للسماوات والأرض وخلق الأرض واعدادها للحياة مع مقدمة هامة في فصلين، الطبعة الأولى (مطبعة لجنة البيان العربي ـــ القاهرة).
ـــ أحمد، حنفي (١٩٥٨): ''التفسير العلمي للآيات الكونية في القرآن'' (دار المعارف بمصر ـــ القاهرة).
ـــ بن نبي، مالك (١٩٦٨): ''الظاهرة القرآنية'' ـــ ترجمة عبد الصبور شاهين ـــ دار الفكر (بيروت).
ـــ حتحوت ، حسان (١٩٧٦): ''الاجهاض في الدين والطلب والقانون'' (تحت النشر).
ـــ خان ، وحيد الدين(١٩٦٦): ''الاسلام يتحدى'' ـــ مدخل علمي الى الإيمان ـــ تعريب ظفر الاسلام خان، مراجعة عبد الصبور شاهين نشر دار البحوث ـــ العلمية الكويت ـــ (١٩٦٩).
ـــ خان ، وحيد الدين (١٩٧٢): ''الدين في مواجهة العلم'' ـــ ترجمة ظفر الاسلام خان، نشر دار الاعتصام ـــ (بيروت).
ـــ الخطيب، عبد الغني (١٩٧٠): ''أضواء من القرآن على الانسان ونشأة انتون والحياة'' ـــ مكتبة دار الفتح (دمشق).
ـــ خلاف ، عبد المنعم محمد (١٩٧٤): ''المادية الاسلامية وأبعادها'' دار المعارف بمصر ـــ (القاهرة).
ـــ رابورت، س. ، رايت هـ. (١٩٦٨): ''العلم معنى وطريقه'' ترجمة محمد أحمد بنونه ـــ سلسلة دنيا العلم رقم (١) مكتبة الانجلو المصرية ـــ (القاهرة).
ـــ الراجحي، عبد الغني عوض (١٩٧٤): ''العلم والايمان في بناء الأمم والمجتمعات'' (مجمع البحوث الاسلامية ـــ الأزهر) (القاهرة).
ـــ رسل، برتراند (١٩٥٦): ''النظرة العلمية'' ترجمة عثمان نوبة، مكتبة الأنجلو المصرية (القاهرة).
ـــ زكي، أحمد (١٩٥٦): ''مع الله في السماء'' (دار الهلال) (القاهرة).
ـــ زكي، أحمد (١٩٧١): ''في سبيل موسوعة علمية'' ـــ دار الشرق (بيروت).
ـــ زينو، حسن (١٩٧١): ''التطور والانسان'' ـــ دار الدعوة ـــ (بيروت).
ـــ السكري، علي علي (١٩٧٣): ''للعرب وعلوم الأرض'' ـــ منشأة المعارف بالاسكندرية.
ـــ الصواف، محمد محمود (١٩٦٧): ''المسلمون وعلم الفلك'' ـــ الدار السعودية للنشر (جدة).
ـــ طبارة، عفيف عبد الفتاح (١٩٦٦): ''روح الدين الإسلامي'' ـــ عرض وتحليل لأصول الاسلام وآدابه وأحكامه تحت ضوء العلم والفلسفة ـــ الطبعة السابعة (دار العلم للملايين) (بيروت).
ـــ عالم الفكر (١٩٧٠): المجلد الأول ـــ العدد الأول (ابريل ـــ مايو ـــ يونيو (١٩٧٠) ''عصر الأزمات'' وزارة الاعلام ـــ (الكويت).
ـــ عالم الفكر (١٩٧٠): المجلد الأول ـــ العدد الثالث ـــ (اكتوبر ـــ نوفمبر ـــ ديسمبر ١٩٧٠) ''الانسان والكون'' ـــ وزارة الاعلام ـــ (الكويت).
ـــ عالم الفكر (١٩٧٣): المجلد الثالث ـــ العدد الرابع (يناير ـــ فبراير ـــ مارس ١٩٧٣) ''النشوء والارتقاء'' ـــ وزارة الاعلام ـــ (الكويت).
ـــ العظم، يوسف (١٩٧٠): ''انتصار العلمانية على الخرافة.. لا على الدين'' ـــ المنهزمون ٤ مؤسسة الرسالة ـــ (بيروت).
ـــ الغمراوي، محمد أحمد (١٩٣٦): ''في سنن الله الكونية'' ـــ مطبعة لجنة التأليف والترجمة والنشر ـــ (القاهرة).
ـــ الغمراوي، محمد أحمد (١٩٥٠): ''الطواف من الفطرة'': لواء الاسلام (٥) ٢٩٦ـــ٢٩٩ (القاهرة).
ـــ الغمراوي، محمد أحمد (١٩٧٣): ''الاسلام في عصر العلم'' ـــ الدين والرسول والكتاب ـــ اعداد أحمد عبد السلام الكودني ـــ دار الانسان للتأليف والترجمة والنشر (القاهرة).
ـــ الفندي، محمد جمال الدين (١٩٦١) : ''من الآيات الكونية في القرآن'' من سلسلة دراسات في الاسلام، يصدرها

المجلس الأعلى للشئون الإسلامية بوزارة الأوقاف ــ (القاهرة).
ــ الفندي، محمد جمال الدين (١٩٦١): ''الفضاء الكوني'' المكتبة الثقافية: ٣٧، وزارة الثقافة والارشاد القومي ــ الادارة العامة للثقافة ــ دار القلم ــ (القاهرة).
ــ الفندي، محمد جمال الدين (١٩٧٢): ''رسالة العلم والايمان'' ــ المجلس الأعلى للشئون الاسلامية ــ لجنة الخبراء، الكتاب ٩١، مطابع الأهرام التجارية ــ (القاهرة).
ــ الفندي، محمد جمال الدين ــ حسن ، محمد يوسف (١٩٥٧): ''قصة السماوات والأرض'' ــ كتاب الشعب ــ ٢ ــ جريدة الشعب (القاهرة).
ــ فرج ، ابراهيم عبد القادر محمد (١٩٥٩): ''علم الأرض'' ــ في جزئين ــ دار الكتاب المصري (القاهرة).
ــ القرطاس، قيس (١٩٧١): ''نظرية داروين بين مؤيديها ومعارضيها'' ــ مؤسسة الرسالة (بيروت).
ــ كانون، أ جراهام (١٩٥٨): ''نظرات في تطورات الكائنات الحية'' ترجمة عبد الحافظ حلمي و مراجعة د. كامل منصور ــ الناشر مكتبة الانجلو المصرية (القاهرة).
ــ كاريل، اليكسيس (١٩٣٥): ''الانسان ذلك المجهول'' تعريب شفيق اسعد فريد (مؤسسة المعارف) (بيروت).
ــ الكرداني، أحمد عبد السلام (١٩٧٥): ''نماذج من الاعجاز العلمي للقرآن (عن كتابات المرحوم الدكتور محمد أحمد الغمراوي) مطبوعات الشعب (القاهرة).
ــ كنجو، خالص (١٩٧١): ''الطب محراب الايمان'' ــ مؤسسة الرسالة ــ (بيروت).
ــ كيرة، محمد السعيد (١٩٥٠): ''آمنت برب السماوات السبع والأرضين السبع'' لواء الاسلام (٥): ٦٥ ــ ٦٧ (القاهرة).
ــ لانداو (ليف) وورمر (بوري) (١٩٦٩): ''ماهي النظرية النسبية'' دار مير للطباعة والنشر ــ (موسكو).
ــ محمد، خطاب بيك (١٩٥٠): ''الأرضين السبع'' لواء الاسلام (٥) ٢٩ــ٣٣ (القاهرة).
ــ محمد، خطاب بيك (١٩٥٠): ''الحجر الأسود وحقيقة عنصره'' لواء الاسلام (٥) ٢٩١ــ٢٩٥ (القاهرة).
ــ محمود، مصطفى (١٩٧١): ''رحلتي من الشك الى الايمان'' ــ دار النهضة العربية (القاهرة).
ــ مترام، فزهنز (١٩٦٦): ''الأساس الجسماني للشخصية'' ــ ترجمة د. عبد الحافظ حلمي محمد، مراجعة د. محمد رشاد الطوبى، سلسلة الألف كتاب رقم ٥٥١ ــ لجنة النشر العلمي بوزارة التعليم العالي. الناشر: مركز كتب الشرق الأوسط (القاهرة).
ــ سوريون ، ا. كريسي (١٩٥٥): ''العلم يدعو الى الايمان''، ــ ترجمة محمود صالح الفلكي ــ مكتبة النهضة المصرية (القاهرة).
ــ مونسما، جون كلوفر (محرر) (١٩٥٨): ''الله يتجلى في عصر العلم'' ــ تأليف نخبة من العلماء الأمريكيين بمناسبة السنة الدولية لطبيعيات الأرض ترجمة الدمرداش عبد الحميد سرحان، مراجعة و تعليق محمد جمال الدين الفندي، نشر مؤسسة الحلبي وشركاءه (القاهرة).
ــ النجار، زغلول راغب محمد (١٩٦٩): ''محاولات الانسان التقدير عمر الارض'' ــ كتاب الموسم الثقافي لجامعة الكويت للعام الدراسي ١٩٦٩/٦٨ (ص٤٦٥ــ٥٠٥).
ــ النجار، زغلول راغب محمد (١٩٧٢): ''الانسان والكون'' مجلد محاضرات الموسم الثقافي، حكومة أبو ظبي ١٩٧٣/٧٢ وزارة شئون الرئاسة ــ الشئون الثقافية: ص١٩٥ــ٢٢٤.
ــ النجار، زغلول راغب محمد (١٩٧٥): ''نقد كتاب الاسلام يتحدى'' (مدخل علمي الى الايمان) لوحيد الدين خان: مجلة المسلم المعاصر ، العددان ٢،١ (ابريل ١٩٧٥) ص١٨٠ــ٢٠٦ (بيروت).
ــ نوفل، عبد الرزاق (١٩٥٨):''الله والعلم الحديث'' ــ مكتبة مصر ــ (القاهرة).
ــ نوفل، عبد الرزاق (١٩٦٠): ''المسلمون والعلم الحديث'' ــ مؤسسة المطبوعات الحديثة (القاهرة).
ــ نوفل، عبد الرزاق (١٩٦٤): ''بين الدين والعلم'' ــ دار مطابع الشعب ــ (القاهرة).
ــ نوفل، عبد الرزاق (١٩٧١): ''أسرار وعجب'' (الناشرون العرب ــ مطابع الشعب (القاهرة).
ــ نوفل، عبد الرزاق (١٩٧٥): ''الاعجاز العدى للقرآن الكريم'' ــ الطبعة الثالثة دار الشعب ــ (القاهرة).
ــ وجدي، محمد فريد (١٩٧٢): ''المستقبل للاسلام'' ــ دار الكتاب العربي ــ (بيروت) معاد طباعته.