Reflections on Science at the Interface of the Islamization of Knowledge Debate

by

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Abstract

The author revisits the forty-year Islamization of knowledge debate in relation to science. He maintains that values and the worldview have an undeniable role in science and its multidimensional growth. He maintains that the role of values in science is no more controversial, and if some people still deny it, it may not be long before they will reverse and reframe their opinion on the relation between science and religion.

It was around forty years ago that the debate on science in the perspective of the Islamization of knowledge began, and passing through different stages, it now seems to have reached an impasse that can be decisive for its future. Its wide spectrum, however, unequivocally proves that values and worldview have an undeniable role in science and its multidimensional growth. As a matter of fact, the role of values is no longer controversial, and if some people still deny it, it may not take long for them to reverse and reframe their opinions.

Today, values and science are mutually influential in the sense that values influence science and are also influenced by it. As a matter of fact, the real importance is that of the cultural and civilizational environment, in which science operates and in which the values become effective and functional. The relation of culture and civilization with science assumes greater significance in the Islamization of knowledge debate, which quite often raises questions on the future of science in the Islamic societies that are witnessing change. In other words, will the pattern of the progress of science also change with changing social structures – or will it continue to

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grow as it has? Indeed it is a significant question not only for the Muslim societies, but also for other societies who are in search of new models of socioscientific development.

Additionally, Islamization, in the context of science, has roots in increasing awareness of the nature of science and its role in the development of human society in general. Specific Muslim issues have also been significant in this quest. Thus, there are two major concerns of our time, which have prompted Islamic intellectuals and thinkers to examine the present-day situation with regard to individual and society. One centers on intellectual security, and the second concern is related to the concept of development. Fortunately, or unfortunately, science has played an important role in both. Science has dominated the intellectual horizon of our time and has also become a source and means for shaping the development pattern and strategy. The way it has grown in the West has even raised questions about those domains of knowledge and wisdom, which were considered settled and had successfully guarded human's intellect from straying into the wilderness. Intellectually, thanks to science, a secure world has now turned into an insecure zone. The biggest casualty has been humans and the societies they live in. It can be seen in our disintegrated societies and the broken family structures of our time. Ethics and morality that constituted superior domains are now vulnerable to the material standards of science.

Similarly, a very skewed model of development dominates the scene and is propelled by science. That it takes care only of material development and pays no respect to human's moral or spiritual demands is all too apparent. Its most disturbing aspect, however, is that it is at the cost of the human sense of morality and spirituality and is being promoted for the monetary benefits of the powerful who dominate the scene. As a result, science has become a tool of violence and tyranny, and the victims are human beings and nature as a whole. Knowledge, being the main vehicle of the modern age, came under the view of the critics and thinkers and Muslim intellectuals, who began to realize that Islamic view of knowledge was vitally different from the prevalent one. The Islamization of knowledge debate hinges on this realization. Although this difference manifested itself in very limited areas, these areas were very important and cannot be overlooked.

The idea of Islamization of knowledge is not an old idea. During the twentieth country, which is marked by the quest of Islam as a total system of life, it became an intellectual necessity to search for the Islamic dimensions of every aspect of life, including knowledge.[1] The quest of Islam as

a system of life, with emphasis on its political dimensions dominated the scene. However, with the passage of time, it became increasingly clear that political system was not an independent system. In fact, it was quite complex and was connected with several other dimensions of life. These other dimensions not only influenced the political system but were also themselves influenced by the political thinking. Thus, economics became the next important issue of the thinking of the protagonists of Islam as a system of life. It was more so because the prevalent economic system had become a source of tyranny and exploitation of the common person and also because the Qur'anic instructions against usury and interest were quite obvious.

Efforts in favor of Islamic economics soon gained momentum and gradually it began to be recognized as an academic discipline.[2] The development of some modern products like Islamic Bank and others served a great deal in the realization of Islamic economics as a viable discipline. However, although work was done on psychology and education also, nothing substantial could emerge.

These efforts gave way to an undeniable belief that knowledge in its modern dominant form is totally submerged in materialistic values and thinking, and these same values are being transmitted to every individual and society that is under its spell. The intensity of this realization gradually became the need and rationale for the Islamization of knowledge, science including. Although an eminent scholar like Seyyed Hossein Nasr had already produced brilliant analyses and his own Islamic critique of science,[3] his views, which are dominated by sophistic thinking and an insistence on the role of intuition in scientific activity, could not gain currency in the dominant Islamic circles spearheading the cause of Islamization of knowledge, and they also failed to motivate the working scientists to develop a working model of Islamic science. Thus, when the cause of Islamization of knowledge was taken up by Naquib al Attas[4] and Ismail Raji al Faruqi,[5] the case of science attracted the attention of science scholars.[6]

Another motivation originated from the identity consciousness, which arose out of a conscientious acceptance of and the emergence of Islam as a system of life. It motivated the adherents to think, express, and if possible, work against tyranny and exploitation in whatever permissible way it was possible. This was the time science began to open itself, and in spite of all its glory and great success stories, the role of science as an agent of tyranny and exploitation quickly became apparent – and consequently a

target of critical evaluation among intellectuals. The practitioners of science insistence on the scientific method as the only method of knowing came under sharp criticism. Science's inherent values, which had failed to control its exploitative potential, were also targeted. Thus, the issues that were specific to science became handy to the protagonists of Islamization of science. Some of these were internal to science, while others came from the outside environment.

Yet, another important factor, which paved the way for an urge to Islamize science, was Muslims' concern for their lack of performance in science in spite of their increasing involvement in this area. Muslim society's general apathy for scientific orientation, and its inability to produce significant science even in its own institutions, led them to think that there was something wrong in the social foundation of modern science because it appeared to be a product of a Western social structure.[7] In earlier phase, in which science was viewed as antireligion, it was perhaps rightly considered that modern science is unable to flourish in a religious environment. Although Muslims were marginalized in almost every front and science was not an exception, it was an important question: "In spite of a great emphasis in the Qur'an on thinking, questioning, and on reflecting in the Qur'an, why was the Muslim society not witnessing any growth in science?" This situation lead Muslim thinkers to search for the Islamic roots of science, and the expectation was that this will help them internalize it as a religious activity. Writings on Islamic science in the eighties appear to be dominated by these ideas.[8]

Another important reason for religious interest in science was based on the fact that by now science had turned out to be the only source of power in the world. Nations strong in science had become leaders and had total sway in world affairs. Be it economy, technology, or industry: in every field, these scientifically advanced nations dominated the scene and other nations – and the resource-rich Muslim nations in particular were heavily dependent on them. Muslims were eager to relive their glorious past, but they had neither necessary tools in their hands nor the vision to acquire them. Therefore, the call for an Islamic vision of science attracted Muslim intellectuals.

The discourse of Islam and science developed and progressed into two related directions. Converging on the Qur'an and the Islamic tradition was one way in which science's objectives, products, and results were evaluated as eventually meeting the basics of an understanding of the meaning of the Qur'an. In addition to following the Qur'an, another way diverged

from it and gave recognition and credibility to human experience. For obvious reasons, I prefer the second line of thinking is preferable, and I ignore the first approach on the apprehension in first approach that when science is subjected to scrutiny based on its following the Qur'an in several cases, we may be lost in the quagmires of philosophy and metaphysics, and this may cause stagnation. This will not only leave scientific activity bereft of its dynamism, but also make it incapable to solve the problems that it is known to stand for. This approach, therefore, becomes a mere intellectual exercise – self-satisfying, soothing, and increasing the inner riches of an individual but failing to bring the required benefits.

In my view, therefore, for the Islam and science debate to flourish healthily, it must proceed in a general intellectual environment constructed on the basis of values rooted in the Qur'an and then having the freedom to diverge from it. By doing so, we will not only avoid our apprehensions regarding the loss of dynamism in Islamic values but will also keep intact the problem-solving nature of science as well. This will obviously not help solve all the questions emanating in the relationship between Islam and science; new questions will continue to grow. However, it will assuredly change the nature of questions while maintaining dynamism.

Consistent with the main theme of this article, which centers around the problem of the Islamization of science, there are five sub-themes. First is the significance of civilization and culture in the debate of Islam and science. Without having a better understanding of civilization and culture, the role and scope of values in science can't be understood.

The facets of knowledge – its concept, nature, scope, and interconnection – constitute the second aspect of the Islam and science debate, which facilitates to highlight science and value relations. This debate is central to understanding the process and various dimensions of Islamization of knowledge interfacing science and is also necessary to know as to how and when science or knowledge assumes the status of *ilm*, the term the Qur'an frequently uses for knowledge.

The third aspect deals with the interface of science and Islamization and elaborates the meaning of Islamization in the context of science – including the questions: "Which aspect of science needs Islamization and wherein no ideological interference is required?"

The fourth aspect deals with the values which are external to science but influence its developments and growth and may be ideologically vulnerable.

The fifth point deals with necessary ingredients for Islamization and also reflects upon its institutional requirements – pointing out to the changing scenario with respect to its scope, limitation, and strategy for achieving the objective. Finally a conclusion sums up the debate.

Knowledge Vis-a-Vis Culture and Civilization

Essentially, knowledge refers to information. However, when it results from the interaction of sensory organs and embodies values and objectives, implicit or explicit, it becomes knowledge and is referred to *ilm* in the Qur'an.[9] Knowledge does not grow in vacuum. It needs a civilization and a culture for it to grow and flourish. Culture, in fact, refers to an ideology, comprising principles and concepts which help bind humans with the material universe and God, the Creator. On the other hand, civilization refers to the growth of tools that unroll the material universe and help it grow at a particular point of time. This apart, the quality of tools also point out to the nature and levels of human's mutual relations and their shape in the changing scenario. For a culture to be based on firm and positive footing, the human mind must be in a bond with a suprahuman guidance, whereas for a civilization to grow and develop it has to be in constant touch and interaction with worldly phenomena and the objects which constitute the world. Since culture comprises principles and concepts, it does not undergo any profound change with the passage of time. What may change, is its understanding or its manifestation with changing conditions. However, the case of civilizations is different, and down-to-earth change can be witnessed here. New knowledge and the result of research, which have paved the way for the growth of today's civilization, can become obsolete tomorrow, leading to the belief that the past was less developed and the future may be better than the present.

Still, it should be noted that whereas the constituents of culture are distinct from those of the civilization, there are many similarities as well. Human-and-nature relations, and then human-and-God relations, which together constitute an integral part of culture, influence civilization also. For example, in a civilization, the production of tools is purpose oriented and objective dependent and is therefore influenced by concepts that govern human-and-nature, and human-and-God relations. Thus, civilization and culture stay distinct with some fundamental common elements overlapping occasionally. Nevertheless, it must be noted that the common elements are much more fundamental than those which serve to distinguish culture

from civilization. And in case these common elements stay dormant and play no significant role in the growth of a civilization, the specific tools that are used may become a source of tyranny and exploitation. They otherwise serve to ensure people's security, peace, and better and more comfortable living. This leads one to conclude that a group may be strong culturally but its civilization need not be so impressive. In fact, cultural strength does not warrant civilizational supremacy. This realization may solve the riddle that what has made many a people culturally much superior has also made them civilizationally poor.

Culture does give a vision for the production of tools, but in the main, it gives direction for properly using the worldly resources with the help of these tools. The standard and authenticity of the values of a culture determine more the direction of the usage rather than the production of the tools. Interestingly, however, certain cultural values are more akin to production rather than to the direction for the tools. This results in an imbalance. Where culture comprises values of reverence to worldly phenomenon or things, the growth of civilization is diminished. On the other hand, if a culture assigns the human with the status of master of universe, the growth of civilization is fast but it soon becomes the source of tyranny and exploitations. However, in the cultures based on principles and concepts promoting the universe as trust (*amanah*) and its usage for the betterment of life, civilizational growth is not as fast, but its longevity and strength become uncontestable.

Thus, whereas culture serves the vertical promotion of knowledge, the civilization supports its horizontal growth. In fact, civilizational development ensures and accompanies faster development of knowledge. The values of culture and its components that are essential for the growth of knowledge include freedom of expression and a society supporting the growth of knowledge and giving due recognition to the scholars and experts. If the case is contrary, either the societies fail to sustain these potentials or they are used for the benefit of others.

Knowledge and Ideology

We have already pointed out that *ilm* (the knowledge) stands for the information directly or indirectly reaching us by sense perception and affirmed through our intellect. Similarly, the knowledge through *wahi* (revelation) assumes the status of *ilm* when it is affirmed by intellect. It is for this reason the Qur'an approaches and appeals to human intellect for the acceptability

of its message and does not demand so only on the strength of its divine origin.

It is interesting to note that the knowledge obtained through sense perception has certainty and this certainty in knowledge later emerges in the form of science, which is initially individualistic but impacts humanity when it becomes a social phenomenon. On the other hand, the knowledge emerging through the interaction of revelation and intellect is bereft of constancy at the level of certainty. Sometimes, certainty rises, and sometimes it falls. This knowledge forms the basis of *iman*, in which the level of certainty is ever fluctuating. Although *iman* can't take the place of science, its impact on individual and society is absolutely unignorable. It helps science grow and provides it with a frame of value, and this results in a healthy direction for its development.

In the realm of knowledge, *ilham* (intuition) is another source.[10] Though it is not a legitimate part of scientific method, its role in scientific research is a common experience among scientists and researchers. However, no information obtained through *ilham* can become a part of science unless it is proved by scientific method. Certainty obtained by *ilham* is always a pseudo certainty, but then, there is another dimension to it. *Ilham* also mobilizes an individual's internal powers and gives healthy direction for the growth of a person's intellect. In my view, another important aspect of *ilham* in the realm of science is that once its role is accepted and recognized by the hegemony of scientific method, it is replaced by a more sober and civilized view of accepting the possibility of multiple methods for multiple layers of reality and existence.[11] Once the hegemony is weakened in science and the scientific method no more symbolize arrogance and domination, and the inner riches of human beings begin to flourish. Yet, accepting *ilham* uncritically is dangerous – because by becoming a part of a philosophical tradition, science may enhance an individual's insight but can't be a source of civilizational growth.

The Qur'an describes as *ayat* (signs) all such objects and phenomena that are studied in science. By so doing, the Qur'an establishes a very intimate relation with science and encourages its follower to consider the worldly things and phenomena in the same way as the verses of the Qur'an. The Qur'anic verses, being the most reliable source of contact with the God Almighty, these worldly *ayat* are supposed, in principle, to serve the same purpose. Thus, the entire scientific activity – including observation, thinking, and reflection, and the process of drawing conclusion through observation and experiments – all are sources and means of developing a rela-

tion with God. Seen in this perspective, the results of the scientific activity and products of technological and scientific development, which make life more comfortable and the earth more liveable, fulfills the Qur'anic objective. So, the knowledge of science and its applications develops harmony with the Qur'anic *ayat*.

There is another way in which the ideology influences the knowledge, and that is by elaborating the objective of knowledge. The question why should knowledge be acquired has been answered in term of attaining *ma'arifa*. In one instance, the Qur'an points out to those involved in reflecting and thinking, "O! God, you have not created anything in vain (Qur'an 3:191)." This is the beginning of the attainment of the level of *ma'arifa*. Achieving this level is also a part of the objective of scientific activity. *Ma'arifa*, in fact, stands for integrating the knowledge of phenomena with human welfare and relating it finally with God – thereby converting purely a material relation into a spiritual one. Thus, we find a purely scientific activity serving a spiritual end.

Another objective of knowledge is just to know what one wants to know. Therefore, mere knowledge for knowledge sake is also an objective, which was expressed in one way by Prophet Mohammad when he prayed to God to give him the knowledge of the reality of things, and Prophet Ibrahim expressed it in another form when he prayed to God to let him see how the dead will be recreated on the Day of Judgment.

Even while solving the problems, the role of ideology is apparent. Knowledge related to health, agriculture, or another field have been categorized as obligatory knowledge (*fard-i-kifayah)* by the old masters.[12] And since the span of such knowledge is bound to increase with the passage of time, the knowledge related to the present-day science policy has now been taken into *ulum-al-shariah* by some scholars.[13] Which way should knowledge grow and which need is to be attended to or be preferred – for example, defense, health care, the immediate needs of people, etc. – all are guided by ideology. Briefly, the growth and the direction of knowledge have roots in ideology, and since in Islam, things and phenomena are considered *ayat*, the knowledge – or say, science – serve to satisfy our religious objectives.

Until now in this discussion, I have concentrated on two points. In one, I have said that a civilizational and cultural context is essential for the growth of knowledge – that is, knowledge is either influenced by the cultural constituents or is a shadow of the same. The other point deals, in a bit more detail, with the knowledge per se: I have maintained that knowledge

is a product of sense perception, and its nature and scope are determined by the ideology. In other words, in whichever society the knowledge grows, it is necessarily influenced by the ideological base of that society.

This discussion provides us with the environment necessary to better understand the Islamization of knowledge – its process, the demands, and its limitations in the context of science. Without this background reminder, this great movement of the twentieth century, which began with a great fanfare and soon lost its steam, will remain elusive to our intellectual grasp.

Islamization and Science

As suggested earlier, Islamization refers to converging to or diverging from Islam. It looks simple, but in reality it is quite a complex exercise. We know that knowledge evolves, and in this process of evolution, the worldview – and individuals and society with their needs and arising questions – all play their role. In fact, all these put together determine the speed of evolution and also its identity. When the collective conscience of Islamic society was alive and dynamic, and whatever form of knowledge grew, the worldview – that is, in other words, the operative individual and collective objectives – had great bearing on it. Obviously, no question on the Islamicity of the knowledge arose. However, the modern knowledge, which evolved in a worldview not in coherence with Islamic ideals, could not be taken so, and it therefore became something external in modern Muslim society. The Islamic worldview was not in a position to govern and direct the growth of knowledge and technology, and therefore, the Islamization of knowledge came in as a means of achieving this objective. However in science the Islamization of knowledge faces big questions. One question is whether it is possible to develop knowledge, knowledge of science in particular, in the perspective of *ilm*. And equally important is the question whether there is a need for developing this knowledge and also the chances of success in a dominant unsupportive environment like that of today. Without indulging into these complexities that are involved, I assert that in today's world, global interaction and intervention have become comparatively easy, and further, even the dominant worldview is being looked upon with doubt. In such a situation, a transformation of the nature of science, or knowledge for that matter, may not be a very distant reality.

Let me begin by explaining what does Islamization of science really mean? What is included in it, and what is not? Here, I will refer to and discuss the steps involved in the scientific process and show how and where

values intervene in the process, and as a consequence, open the process up for our quest of Islamization.

Step one

The very first step in the process of science is the articulation of the question itself—that is, to know or to identify the problem. Since science is a problem-solving activity, we would, therefore, first concentrate on the nature of the problem itself. In this context, questions like, "Is the problem related to human beings?" If "yes," "Is it related to their health or their basic needs—for example, food and nutrition, facilities for traveling or clothes, etc?" The preference – that is, which issue is to be taken up for scientific solution, will be decided by the nature of the issues itself. In an ordinary condition, the above issues carry weight. However, in changed circumstances, these preferences may change. Obviously, the preference has roots in ideology, and this plays an important role in deciding what type of problem deserves a scientific solution.

Step two

Second comes an analysis of the work so far done on the issue. Obviously, this is a kind of survey of the information available on the attempts already made to solve the problem under consideration or other similar problems. This survey is analytical, informatory, and critical, and this helps identify a possible course of action. And this is where a hypothesis is made for framing an approach and action. The greater the seriousness and depth of the survey, the better and effective the hypothesis. This stage, demands emotional attachment to the problem, on the one hand – and to be necessarily objective about whatever has been done so far, on the other. If a researcher is not emotionally attached to the problem, he or she may be mistaken in choosing the problem itself. Similarly, the absence of objectivity in analyzing the work done may lead to a faulty strategy in the process of solving the problem. Since sentimental attachment and objectivity are both necessary in the initial stage of the process, the preference as well as hypothesis formation, are prone to ideology and sensitive to a value system. It must, however, be noted that the emotional attachment and objectivity are achievable, and have been achieved in the ideologically neutral environments as well.[14]

Step three

In science, it is basically data collection, which is done by means of ex-

periments. Normally, we are accustomed to seeing the new data and the "results" in the backdrop of data already available or the inferences already drawn. This becomes a limitation that sometimes helps improve our research, and other times, blocks the creation of new inferences. Therefore, this third step is basically a data-collection step, and it should be neutral to ideology or to a worldview.

Step four

Inference making is the next and normally the final step and depends upon a researcher's own strength of conviction and courage to go beyond the dominant ideas. Thus, in this step, it is essential to guard the researcher's freedom from the influence of ideology.

Quite often, the scientific research ends up at this step; however, the application of the inference is also sometime taken up as a part of scientific research. The guinea pig used while examining and applying the inferences obtained have ideology-prone dimensions. Values surface vehemently when these tests are conducted on human samples.[15]

In the above four steps, most conspicuous are the values that can be termed as "internal values" of science. There are, however, external values as well.

External Values of Science

Some values of science are related to the external environment in which it functions and operates. Some of these are based on the individual who is the main player in the scientific activity. Others are based on the relation of the person to things that are occurring and becoming the object of scientific activity. All of these impact on scientific activity and are connected with the ideology.

Of prime importance are the values that have an origin in a human being, define this person, and make this individual accountable for his or her deeds and position on earth. Therefore, the Qur'anic concepts of *aakhira* and *khilafah* should directly impact scientific activity. In the backdrop of these concepts, a person can't be free from responsibility simply by saying that what he or she invented and proposed was misused by others and he or she is not responsible for their doings. It does not mean that the concepts of *aakhira* and *khilafah* restrict human's freedom of thought and invention. Rather, they make the scientists act more responsibly in their creative and innovative endeavors.

Another point that deserves to be taken very seriously is that the total reality under the investigation of a scientist is not before him. The concept of *tawhid*, which is more important for its theological significance, also refers to the web of relations,[16] which binds different creations and suggests that creations are interrelated and interconnected. Science does point out and gives hints to this interrelatedness and interconnectedness but is absolutely unable to reveal and unfold their details and possible ramifications. As a matter of fact, scientific research does not take this into account; rather, it ignores this dimension. The entire issue of environment degradation is essentially rooted in not understanding or overlooking these relations. Thus, the concept of reality and its relation with scientific research is a dimension that is directly influenced by and is prone to Islamic values.

However, another issue is the objective of the research. The values that influence the objectives – that is, the solution of the problem, knowledge for the sake of knowing, and attaining the *ma'arifah* (knowledge of things or phenomena in relation to God) are all rooted in ideology. The limitation of the scientific method has already been emphasized. However, the scientific method has been taken as the only genuine method of knowing, and this has diluted the significance of other dimensions of knowledge and their method of knowing. This has developed a sense of superiority not only in science but also in its practitioners. Monitoring every other knowledge with standards set by the scientific method, making use of this method in social sciences and ignoring the difference between the mute objects of science and the living objects of social science has done great harm to knowledge itself.

The idea of the superiority of the scientific method is based on the view that reality is one which can be grasped by scientific method only. Though this viewpoint is not seriously accepted now, but the entire structure of science continues to grow on its base. In Islam, as in many other religious traditions, reality is not material only. In fact, it has different real existences, which can be understood by different methods respectively. Even in the case of material reality, there are several problems. Being of the same origin, the material reality demands a kind of uniformity, and expectedly it does exhibit it. Unfortunately, however, it does not go too far, and the inferences drawn quite often show their inadequacy. The role of the scientific method is not only very limited but is also a little uncertain, and the complexities of relations between society and the material world remain elusive. This realization not only necessitates but also strengthens our be-

lief in the rationality of multiple existence and multiple methods. This once again is an ideological issue and is therefore sensitive to ideology.

Eco-action for an Eco-functioning Universe

One very important and interesting aspect of scientific findings is the human-friendly nature of this universe as evident in the harmony and beauty found in the operative principles which govern it. This realization must have deep impact on human thinking and should take the human to spiritual heights. When this impact is loaded with a capacity to activate a person's conscience and a drive to act, the resulting relation with universe eliminates *fasad* (disturbance) and introduces elements of *adl* (justice) and equality. Scientific findings pointing out to an eco-functioning universe necessitate eco-actions in order to maintain harmony and protect it from *fasad*.

Science does point out to the need of eco-action, but it is not in a position to explain as to what this eco-action can be. To compensate for this deficiency, various traditions including religion come forward.

Essential Ingredients

Reflecting on all that has been pointed out indicates that in essence Islamization is a process of introducing and incorporating certain values in science and making it really universal with respect to diverse forms of existence. The major objective is improvement in human conditions and intellectual security; nevertheless, this quest in fact entails a major caution. While exploring, researching, and making use of science for improving the society, the values must ensure not only the present generation's interest but also the generations of those that come later. Exploitation of natural resources is a case in point. And interestingly, Islamic values and perspective are sensitive to these objectives.

For an Islamic perspective of science to be functional and operative, one essential requirement is a social and intellectual environment based on the values and concepts outlined in the above discussion. However, there are some science-specific and additional points, which must be taken care of, for the environment's healthy and positive development.

The following discussion introduces necessary components likely to help individual scientists vigorously participate in scientific activity and simultaneously adhere to values and objectives. It should, however, be noted that for these components to be really effective, cooperation and support

of the culture is essential. If it is missing, as is the case of our present-day society, genuine efforts must be simultaneously made for the promotion of Islamic cultural and pro-scientific values so that an intellectual, social, and spiritual support becomes available. Thus, Islamization of knowledge or of science, is a process of intellectual and social change in which every aspect of society has to grow. The following describes some essentials necessary to bring about this change.

History consciousness

For imparting an Islamic orientation to science, a major prerequisite is to know the nature and history of the scientific tradition of Islamic civilization. What was Muslims' approach and direction, and what were the causes that prompted them to engage in scientific activity? These answers and other similar information can help in many ways:

- This creates the self-confidence necessary for the required energy and enthusiasm for research. In its absence, even brilliant minds behave like followers and fail to produce original things. In every activity, they look to others for excellence and emulation.

- This helps integrate people and rejuvenate their national or communal pride for a more intense and enthusiastic participation and involvement in research activity. By indulging in emotive fascination for the past, a kind of inaction is induced and obviously plays a negative role.[17]

Interaction with current knowledge

Without realizing the nature of modern science, its internal mechanism, and its external dynamics and actually becoming a part of it, these aspects that are required for developing an Islamic critique, can never dawn on a practitioner. It is an essential prerequisite to be a part of a modern tradition of science. And it should be so intense and to the core that one becomes a part of the process of concepts and hypothesis making and the designing of experiments. Along with this, the knowledge of the philosophy of science is also necessary so that the nature of scientific concepts, ideas, and research is also abundantly clear. For example, the fact that scientific facts, principles, and inferences are not finally certain, can't be really understood without going through Popper's falsifiability, according to which nothing can be scientific unless it is falsifiable.[18] Scientific facts are certain only in conditions of time and space to the extent that in spite of their potential

uncertainty, science continues to grow and its structure continues to be established. However, with a change in time and space, dimensions once true and certain may lose their identity. In other words, the scientific facts are in fact provisional facts. Muslim scientists of past times were right in their approach by always ending their findings with *wallahu alam bis-sawab*, which indicated that to the best of their efforts they have reached certainty but the truth of this certainty is best known to Allah only. This tradition, on the one hand, showed the right approach toward the nature of scientific truth, and on the other hand, it shunned the arrogance that sometimes accompanies self-realized truths.

Thinking and reflection

Normal science is the most common form of scientific activity in the third world. In such a practice, a scientist does not generally go beyond application of established processes or the already obtained scientific results. Here, a researcher has no opportunity to think on the basic assumptions and concepts involved. The data that are expected are preserved and passed on, whereas the unexpected data are considered deviations or errors and thus neglected. If every record is preserved and the "errors" and "deviations" are seriously evaluated, interesting changes in the status of scientific facts can be foreseen. Reflecting on it can be helpful in developing an insight into the sociology of science, on the one hand, and may also be fruitful in the advancement of experimental and theoretical sciences. This apart, in principle at least, everything from ideas and thoughts to the "established" facts of science, are reconsiderable and stand to be evaluated and reevaluated. One should also be able to identify the ideological and cultural influences on science and the context of any innovation. Likewise, it is also important to evaluate the values that work to produce and promote the research product and examine the possible connections between various interest groups involved in an influence-making exercise. Thus, a great deal of thinking and reflection is necessary for the healthy growth and development of science.

Facts are hidden

Scientific facts are hidden and deeply connected with other facts as I have already discussed. When facts are not exposed to researchers, only limited aspects of reality reach their comprehension. However, researchers and scientists are not generally comfortable in accepting this limitation and tend to apply the available knowledge to solve every problem, and as a result, sometimes end up with a catastrophe. Most obvious examples

come from environmental problems. Unfortunately, no such technology is yet available that can study things holistically and inform us about these things both in isolation and also in relation to other things far and near. The importance of this holistic approach for the study of nature has only recently been appreciated.

Freedom of thought

Respect and recognition of thoughts and ideas is an integral part of the scientific culture. However, it persists only till these ideas are in conformity with the method recognized by scientists. Otherwise, in principle, even the established facts of science can be scrutinized, and their evaluation is considered a fundamental right of every scientist. And in this, neither experience and seniority nor fame has any value. In fact, to express ideas and results as honestly as possible is an inherent part of the ethics of science and is a source of its growth and progress. These ethics are responsible for not letting in unscientific or scientifically inaccurate ideas into the body of science. If by mistake or by design, some ideas reach the core, these integral, internal ethics check them. This internal system of protection has been operative in every tradition of science, including the Islamic tradition, and is worthy of continuation.

An important point is that new ideas are to be advanced only when they have attained a level of certainty based on the prevalent method of the time. And even then, the discovered truth will be dependent on the time and will remain true until something comes to challenge it. Thus, the nature of scientific truth is always that of a "suspended truth,"[19] which can be contradicted and differed with. In certainty, an inherent element of uncertainty is always there. Accepting and making use of the certainty in our practice in spite of this uncertainty is part and parcel of scientific ethics, and interestingly, it is also an important part of Islamic morality. Freedom and transparency are, therefore, prerequisites for scientific growth and help open new vistas of knowledge in the widest possible ramifications.

Group loyalty

Group loyalty – that is, consideration for a community – is an important factor for every kind of development, including science.[20] Be it for solving the problems or for acquiring power, national or community feelings are natural. If these feelings are not intented to be negative, they can serve as a great source for the development of science, and should therefore be harnessed for the good cause of scientific growth.

The institutions

Another important point is in regard to the institutions in which science can grow in the pattern described above. At present, the universities and research centers are the most dependable platforms for the growth and development of science. Recognition and research both have become the monopolies of universities and research centers, and therefore, those who wish to do something find refuge in and seek patronage from these institutions. However, these institutions have some inherent weaknesses, which in my view have become a deterrent in the proper growth of science:

- Distancing from Nature

  Science research activity and the modern scientists are fast losing even remote intimacy with nature and natural phenomena. The lust of specialization has distanced modern scientists from the apparent realities. Research continues to go deeper and deeper, leaving the surface realities untouched and uncared for. Reductionism still dominates, although holism is gaining currency. Strong scientific relations with nature are bound to enhance holistic culture in the enterprise of science.

- Dependence on Technology

  Distancing from nature has made modern scientific research dependent on technology, and since only Western nations are technologically advanced, most of the advancement of science is seen only in the West and fails to have roots in the developing nations.

- Objectives

  Most research and development is devoted to military and defense objectives, and a major part of resources are used for schemes and programs that only meet these objectives. Similarly, industrial and business objectives are the prime focii of the sponsors of research and development programs. The dominant science, therefore, fails to serve the interest of the common person and becomes subservient only to the principals in resource centers.

Therefore, I, believe that it is difficult to experience the necessary environment in the modern universities, which is essential for the growth of science along the pattern outlined above. However, such an environment could be introduced in Islamic *madrasah*s, which are being already run as alternatives, and experiments can be made to achieve the previously

mentioned objectives. Even if partly successful, the most important benefit of such institutions will be that science will grow and be taught in an environment of values, which promote the use of science for solving human problems and human's spiritual elevation and keep a balanced approach for science's use as a source of power. It should, however, be clear that none of these objectives are achievable in modern universities, and the present-day madrasahs also need a great reformation in their organizations in order to accomplish the desirable activities and results.

Conclusion

Terms like *Islamization of knowledge*, *Islamization of science* or *science in an Islamic perspective* are all interrelated terms and can be distinguished only on minor grounds. However, it should be appreciated that legitimate differences persist in the genuineness of the very idea of Islamization. The view that knowledge is universal and it can't be compartmentalized on the basis of religion has its own strength and logic, but the assertion that religion does make a difference on the priorities of growth, direction, and application of knowledge has equally strong footing.

I believe that a religious affiliation does cause difference but only in the priorities of the generation of knowledge, its use, and the direction of its growth. The contents of knowledge remains the same in every culture, although the incentive for its growth may differ and result in a change in its cultural and civilizational manifestation. Thus, when Islamization is advocated for knowledge or science, it does not mean that a change in the contents of knowledge is being envisaged. It is, rather, the other way round. The contents remain unchanged, but the supportive environment needs to be transformed. The essence of Islamization is, therefore, social change, which may help promote knowledge on the basis of priorities, incentives, and direction rooted in Islam. Interestingly, however, in case of science, this social change will also make deep impact on two other dimensions.

One is related to multiple layers of reality, and the other is identified with methodology. Islam gives due recognition to different levels of reality and advocates different methods for their investigation and study. Scientific method applicable today is legitimate for the material level of reality but does not suit other levels, and therefore, its imposed hegemony is totally invalid and unwarranted. The other is related to the philosophy of reductionism, which has become the hallmark of modern science and science-based cultures. Islam seems to suggest that the reductionist ap-

proach of study is only partially valid and can't be applied universally. In the context of interrelations and interdependence, a holistic approach has to be developed. It is a new area of study and needs the hard work of research and investigation. The concept of nature as *ayat* develops an attitude of care and love, and a kind of reverence for it has potential to replace the currently dominant philosophy based on the dictum that nature does not reveal itself unless it is tortured, i.e. fragmented or reduced to its most basic and elementary constituents.

Thus, Islamization particularly in the context of science demands a social change in which Islamic values dominate or begin to dominate an individual's intellectual horizon and also a society that encourages a policy of science shaped by an Islamic-inspired vision. In other words, science can flourish in a Muslim society only when the society is rich in Islamic values and sensitive to its demands. Moreover, collective and individual dynamism and intellectual propensities are only shaped by these values. In my view, the essence of Islamization of knowledge in the context of science lies in promotion of science in a social and intellectual environment motivated by the values, concepts, vision, and goals outlined in this article. The quest of Islamization of knowledge or say, science, is in fact a quest of a culture and a civilization unique to Islam.[21] Some basics of this quest in science specific realms were jointly debated and agreed upon by a group of scientists in 1994. The declaration they made is now known as the Khandala Declaration.[22] It has great potential for laying the sociointellectual foundation for the growth of science in Muslim societies.

Endnotes

1. Syed Abul A'ala Maududi, founder of Jamaat-e-Islami in India and Pakistan, in his early introductory literature on Islam as a system of life, evaluated and highlighted the role of knowledge and expressed the need to reform it. His approach can be seen in *Talemat*, *Tajdeed Ihyay-e-Deen*, and *Islam ka Sarchashma-e-Quwwat*. His books on birth control and *sood* (interest) are the best examples of the role of a research method in drawing conclusions and influencing the worldview. In some of his letters, he also specifically pointed out the need of evaluating theoretical science on the basis of Islam. One such letter has been quoted by M. Riaz Kirmani in his book *Basar'r-e-Modoodi* (Aligarh, India: Centre for Studies on Science, 1987).
2. Economics began to receive Islamic probing in the fifties of the last century, and gradually there were several Islamically modified contempo-

rary economic products available in the academic world. Today, Islamic economics is an established discipline and is being taught and studied in universities. See Muhammad Nejatullah Siddiqui, *Muslim Economics Thinking: A Survey of Contemporary Literature,* (Leister, UK: Islamic Foundation, 1981).

3. See S. H. Nasr, "On the Perspective," *Journal of Islamic Science* 1, no. 2 (1985): 6; S. H. Nasr, "What is Islamic Science," *Journal of Islamic Science,* 10, no. 1 (1994): 12; S. H. Nasr "The Islamic World View and Modern Science" *Journal of Islamic Science*, 10, no. 2 (1994): 33–35.

4. See Naquib al-Attas, *Islam and Secularism* (Kuala Lumpur, Malaysia: International Institute of Islamic Thought and Civilization, 1993).

5. Ismail al Faruqi, *Islamization of Knowledge: General Principles and Work Plan.* Islamization of Knowledge Series, no. 1. 1982. Herndon, VA: International Institute of Islamic Thought.

6. Ziauddin Sardar, *Islamic Futures: The Shape of Ideas to Come* (London and New York: Mansel, 1985); Ziadddin Sardar, "Where's Where? Mapping out the future of Islamic Science, Part 2," *Journal of Islamic Science*, 5, no. 1 (1989): 90; S. Pervez Manzoor, "Islam and the West Synthesis or Con-fusion?," in *The Touch of Midas: Science, Values, and Environment in Islam and the West*, ed. Ziauddin Sardar (Manchester, U.K: Manchester University Press, 1984), 235; S. Pervez Masnzoor, "Unthought of Islamic Science," *Journal of Islamic Science*, 5, no. 2 (1989): 60; S. Kocabas, "Treaties on Some Question," *Journal of Islamic Science*, 2, no. 1 (1986): 55–53; S. Kocabas, "Grammatical remarks on *aql* in the *Qur'an*," *Journal of Islamic Science* 3, no. 1 (1987): 79–84; S. Kocabas, "Remarks on the concept of *Izn* in the *Qur'an*," *Journal of Islamic Science* 5/, no. 1 (1989); 111–23; S. Kocabas "Remarks on *Sakhkhara* and *Sultan* in the *Qur'an*," 5, no. 2 (1989): 65–77; S. Kocabas, "Islam and Science," *Journal of Islamic Science* 9, no.1 and no. 2 (1993): 67; Yosuf Waghid, 'Creative Order, Truth and Justice: the Rationale of Islamic Science," *Journal of Islamic Science,* 12, no. 1 (1996): 87.

7. Ziauddin Sardar, "Arguments for Islamic Science," in *Quest for New Science: Selected Papers of a Seminar*, ed. Rais Ahmad and Syed Naseem Ahmad (Aligarh, India: Centre for Studies on Science, 1984), 31.

8. Ziauddin Sardar, ed. *The Touch of Midas: Science, Values, and Environment in Islam and the West* (Manchester, U.K: Manchester University Press, 1984).

9. In most cases, the term *ilm* is followed by *sama*, *basara*, and *fawad* in the Holy Qur'an. It is rightly inferred that the inference drawn on the basis of information obtained through hearing and observation are

what is called *ilm* in the Qur'an. However, the overall impression is that according to the Qur'an, *ilm* is a value. In other words. information produced by sense perception gets value loaded while flourishing in the Qur'anic environment and thus becomes *ilm*; see Qur'an (17:36).

10. M. Z. Kirmani, *The Quran and Future of Science* (Delhi, India: Global Vision Publishing House, 2001), 53.
11. S. H. Nasr "Reflections on Methodology in the Islamic Science," *Hamdard Islamicus* 3, no. 3 (1980): 3–13.
12. S. W. A. Husaini, *Islamic Environmental System Engineering* (New York: American Trust Publications, Macmillan, 1980).
13. S. W. A. Husaini, *Social and National Science*, ed. I. R. al Faruqi and O. Naseef (London: Hodder & Stoughton and Jeddah, Saudi Arabia: King Abdul Aziz University, 1981), 149.
14. This refers to present-day scientific activity in a secular environment in which sentimental attachment is a must, because without it one can't remain stuck to one problem while facing back-to-back failures and setbacks. On the same pattern, objectivity is maintained in view of the possibility of rejection of results by others who happen to work on the same problem.
15. Resentment to the use of new drugs on animals is too well known. However, it is also said that sometimes premature drugs are allowed to be used on human beings who, as a result, face their side effects.
16. Theologically, *tawhid* stands for one God – that is, the unity of the creator. This unity manifests itself in similarities and interrelatedness among various forms of creation. Interdependence of one creation on another form of creation also manifests unity of creator. Intra-creation unity and inter-creation unity entails a web of relation that can only be visualized and is beyond the comprehension of the tools of investigation available for present-day scientists.
17. The situation is apparent and manifests in individual and collective responses of Muslims in their writings and speeches. Boasting on past achievements as the prime movers of the present advancement, and thus denigration, it has become the choicest pastime of the majority. Dreaming, sentimentalism, and romanticism becoming the major trait, and this mindset has landed Muslims in lassitude and inaction.
18. Popper's *falsifiability* as a criterion for scientificity is an interesting idea. I believe that this idea originates from the legitimate apprehension that once truth/fact is understood to have been finally reached, it may play a negative role and suspend further investigation and research in the area concerned. Truth having been finely achieved and nothing left for further investigation, is a situation that thwarts scientific research.

Hence for Popper, it is necessary for the scientific facts to function in an environment is always provisional and the facts are potentially falsifiable.

19. Scientific facts are true only in given conditions of time and space, and a change in these conditions may alter the truth or the facts of science. In this scenario, therefore, the factuality of scientific facts is provisional, but this suspension does not influence the dynamicity of these facts, and they continue to work. The idea of provisional truth keeps the progress of science intact and open for newer and newer findings and discoveries.

20. Ibn-i-Khaldun's ideas of *asbiyyah* is valid in his social history but seems to be equally true for the sociology of science. Progress for one's nation or community through science is a sensible and natural desire and can be an important source of development provided it is not at the cost of others' interest. Though hard to accept, nevertheless, it is a fact that even in today's liberated world, these forces play an important role in scientific growth and development.

21. Ziauddin Sardar has explicitly noted this fact in his famous Royal Society lecture in 2006, that for science to grow it is essential to work for the growth of society and make Islam functional and operative. See *Journal of Islamic Science* 22, no. 1 and 2, (2006): 63–82.

22. Around twenty-four liberated scientists attending an orientation program at Khandala (Pune, India), unanimously agreed during the course of discussions from May 29 to June 3, 1994 that the modern science suffered from certain basic and fundamental inadequacies, which can be removed if a religious worldview, say Islamic, is taken as the future frame of reference for scientific activity. The program was jointly organized by The Muslim Association for the Advancement of Science (MAAS) and Centre for Studies on Science, Aligarh.

    An outcome of the six-day-long discussion was the Khandala Declaration, which documented the germination of new ideas that the upcoming scientists will adopt in future. The contents of Khandala Declaration is in *Journal of Islamic Science* 10: 115 (1994) and Mohd. Afzal, *New Science in Making* (Aligarth, India: Centre for Studies of Science, 1996), 69. The Declaration reads as follows:

    a. We recognize that the realm known as "visible world" *(Alam-i-Shahadat)* is only an aspect of the cosmos. The cosmos also has invisible world *(Alam-i-Ghaib)* in it and the "visible and "invisible" are closely related and intertwined.

    b. We recognize that the whole cosmos, including "visible" and invisible" is dependent on God.

c. We recognize that Revelation from God *(wahi)* is the basic source of knowledge about the whole cosmos (including "visible" and "invisible").

d. Since "invisible and "visible" both exist, we recognize "visible" as pointer (sign, *Ayat)* towards realities of the "invisible". In the science practiced today, visible has no such significance and is to be understood at the material level and "exploited", and have no meaning higher than itself. This has lead to desacralization of nature.

e. Science is only a part of a body of knowledge as against the modern science which claims itself to be the totality of knowledge (i.e. nothing is outside the scope of the science; in principle). This point is a direct outcome of the acceptance of revelation *(wahi)* as a source of knowledge. This lopsided view of knowledge held by present day science has lead to derecognizing of ethical values, except on the basis of expediency and has made the whole activity of current science autonomous, i.e. not subject to ethical constraints.

f. The modern science does not recognize that there are levels of being in the universe. It recognizes only one level of being i.e. inanimate and unconscious matter, consisting of particles, subject to mechanical laws. All other realities like "life", "consciousness" etc. are not recognized as independent levels of being but only as "appearances", which are to be explained ultimately in terms of inanimate material particles, and their interplay. This being in contrast to men's belief held throughout the ages is unacceptable. We recognize existence of levels of being and believe that it is more logical and sound.

g. All kinds of observational and experimental methods which are allowed in science today must conform to ethical values.

h. While formulating the concepts, science should become more open and recognize the reality of the invisible world *(Ghaib).*

i. Science reduces, one level of existence to another because it does not recognize them as fundamentally distinct levels. It is highly dangerous and has made science a tool of violence and torture.

j. We should not insist on reducing a "whole" into "parts" and should abandon such narrow-mindedness and study an object as a whole and also as consisting of parts.

k. A natural system (say an ecological system) has several levels of beings and thus can not be studied by reduction based method. Modern scientists should approach religion, say Islam, to understand such a concept of reality.

l. We should stop insisting on quantification.

m. Applications of science must be within ethical constraints according to religious viewpoints say Islam.

n. Scientists must be grateful for bounties of Allah which become available to him by studying nature.

o. The personality of the scientist is important. His intent *(Niyyah)* should be to gain useful knowledge for the purpose of the pleasure of Allah. He should regard nature as His sign *(Ayat)* and should thank *(shukr)* Him. These qualities make him in harmony with Allah's cosmos and also develop in him abilities of intuition and insight, by which he arrives at true concepts intuitively.