

# SECULARIZATION OF SCIENCE AND ITS ISLAMIC ANSWER

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## ABSTRACT

*In order to understand the significance of *The Islamization of Science* and its relevance to the contemporary world, it would be better for us to look at it from a wider context. It is for this reason, I would like to present, in this conference, three interconnected concepts: naturalization, secularization and Islamization of science. By naturalization of science, I mean a process of adaptation, or acculturation of science coming from outside to certain culture in a new country or area so that it will suit the cultural or religious values. Here I will present a number of cases in which this naturalization of science took place in the history—Mesopotamian, Egyptian, Greek and Islamic worlds. The purpose of this section is to demonstrate that science has never been value free or neutral, but it always culturally and ideologically laden. The second section is on the Secularization of science, which means “the process of putting aside all spiritual dimensions from science. In this section I will address the secularization of science as took place in the western world, especially from the post-Renaissance era to the present day. The purpose of this section is to show that the secularization of science did happen in the contemporary world --both in theory and methodology--and became an imminent threat to the Islamic system of epistemology. The third section is on the Islamization of science. By this I mean the process of assimilation of western science—including its adaptation and acculturation—into Islamic worldviews and civilization. The purpose of this section is to reconstruct a science suitable fully to the Islamic values and principle.*

## I. The Naturalization of Science: Introduction

The term naturalization of science has been used by Professor Sabra to refer to the process of acculturation of foreign sciences to a culture prevalent in a new area or country. It is through this process that this science “became fully assimilated to the requirements of its culture, including its religion.”<sup>1</sup> Therefore, the naturalization refers to “the domestication of foreign sciences, thereby incorporating them into an indigenous cultural and philosophical system...”<sup>2</sup> From my preliminary readings, I can see that the naturalization of science (or culture) did happen everywhere throughout the history of science development. For example, when Mesopotamian people absorbed various forms of sciences from the surrounding areas or countries, they adapted and assimilated them to their cultural and religious values thereof, thus created a special form of Mesopotamian culture or civilization.<sup>3</sup>

The similar process of naturalization of science also happened, when the early Greek philosophers took various scientific-philosophical information, from neighboring countries—especially Egypt and Syria. Later, they cultivated these foreign sciences and gradually adapted and assimilated them to their specifically Greek rationalistic form of thought. Abu al-Hasan al-‘Amiri, a tenth century Muslim philosopher, in his *Kitab al-Amad ‘ala al-Abad* tells us that Pythagoras had learned geometry and other mathematical sciences from Egyptians, and metaphysics (*al-‘ilm al-ilahi*) from the companions of Solomon (*ashab al-Sulayman*). Likewise, Empedocles, according to him, learned philosophy (*al-hikmah*) for quite a long time with Luqman al-Hakim, a famous philosopher (*hakim*) mentioned in the Qur’an

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<sup>1</sup> Toby Huff, *The Rise of Early Modern Science* (Cambridge & New York: Cambridge University Press, 1993), p. 64.

<sup>2</sup> *Ibid.*

<sup>3</sup> Isma’il R. Farouki, *Atlas Budaya Islam*, (Bandung: Mizan, 2001), pp. 82-83.

and lived in Syria during the life time of David a.s. However, it was reported that when Empedocles returned to his county, he developed the information taken from his teacher into his own peculiar ideas.<sup>4</sup> No wonder, then, if some of his ideas were different from, or even contradictory with, his teacher's doctrines. From this observation, we can safely say that the great Greek philosophers, such as Pythagoras, Empedocles and so also I believe Plato and Aristotle did adapt or "naturalize," in different style and intensity, all the scientific information and theories obtained from earlier sources, usually mixed with mythical elements, into their "more rationalistic" frameworks. This naturalization of science by Greek thinkers and scientists has resulted in what we call "the Hellenized sciences."

Again, when the Roman "Christian" emperors took control over the post-Alexandrian Greek areas, they gradually adapted and assimilated the Greek sciences and cultures into Christian belief and values. In the introduction to al-Ansari's *Adab al-falasifa*, 'Abd al-Rahman Badawi, wonders why the wise sayings of Greek philosophers, preserved in Christian scholarship in the pre-Islamic period, were so "Oriental" in tone, that they suited well the cultural and religious values prevalent in there? The answer is, according to him, because these wise sayings had been adapted, assimilated or naturalized by Christian scholars, who lived in the Middle Eastern areas, to their culture and religion.<sup>5</sup> Of course, in here we can see clearly the process of Christianization of these sayings. In other words, these sayings of philosophers had been "baptized," to use Van de Bergh's terminology<sup>6</sup>, by Christian Scholars who studied Greek material (including sciences and philosophy) to support their theology. Therefore, it is understandable, according to Mehdi Golshani, that the sciences Muslims encountered in their new territories had already been made "sacred," that they found no difficulty in adapting them into Islamic values.<sup>7</sup>

The process of naturalization of science continued far after Greco-Roman times, and especially became more "prominent" when Islam rose as a great political and civilizational force. Professor Sabra describes three stages of "naturalization" (or "Islamization") of Greek sciences by Muslim scholars. He says "in the first stage we witness the acquisition of ancient, particularly Greek, science and philosophy through the effort of translation from Greek and Syriac into Arabic. Greek science entered the world of Islam, not as invading force setting off from a powerful stronghold in Alexandria, Antioch or Harran, but rather as an invited guest. The Individuals who brought him in kept their reserve and aloofness with regard to the important matter of religion."<sup>8</sup>

However during the second phase, this reserve and aloofness was replaced with heightened curiosity and intellectual experimentation. About this, Sabra states:

The guest quickly proved to hold an attraction for his hosts far beyond the promise of his practical abilities. His powers of persuasion can be seen in the unexpected but almost immediate and almost unreserved adoption of Hellenism by Muslim members of the household, like al-Kindi. But the real measure of his spectacular success is shown in the emergence, during the second phase, of a large number of powerful Muslim thinkers whose

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<sup>4</sup>See Ererrett Rowston, *A Muslim Philosopher on the Soul and its Fate: Al-'Amiri's Kitab al-Amal* 'ala al-Abad (New Haven, Conn.: American Oriental Society, 1988), p. 71.

<sup>5</sup>See Badawi's Introduction to *Adab al-Falasifah* of al-Ansari (Kuwait: Al-munazzana al-'Arabiyya li-Tarbiyya wa al-thaqafah wa al-'ulum, 1985), p. 26.

<sup>6</sup> See Simon Van den Burgh's Introduction to Averroes' *Tahafut al-Tahafut* (London: Luzac & Co., 1954), p.lx.

<sup>7</sup> See Golshani's paper "Science and the Sacred," presented in the Internatinal conference on Religion and Science in the Post-Colonial Era, in yYogyakarta 2003.

<sup>8</sup>Toby Huff, *The Rise of Eraly Modern Science*, p. 63

allegiance to a comprehensive Hellenistic view of the world of matter and thought and values can be described only as a thoroughgoing commitment. Those were the Farabis, the Avicennas, the Ibn al-Haythams, the Birunis, and the Averroeses. I describe them as Muslim because they thought of themselves as such, and because they were attentive to problems generated by the collision between their religious belief and Hellenistic doctrines.<sup>9</sup>

After this, we entered the third phase. In this phase we find the assimilation of philosophical inquiry within the bounds of religious prescription: the practice of *falasifa*, “the type of thought and discourse found in the writings of philosophers like Farabi and Avicenna, began to be practiced in the context of *kalam*, and in which the philosopher-physician (represented by Razi) was replaced by the jurist-physician (represented by Ibn al-Nafis), the mathematician (*ta’limi*) by the *faradi*, and the astronomer-astrologer by the *muwaqqit*.”<sup>10</sup>  
In this last phase

The carriers of scientific and medical knowledge and techniques now largely consisted of men who were not only Muslims by birth and faith, but who were imbued with Muslim learning and tradition, and whose conceptual framework had been produced in the process of forgoing a consciously Muslim outlook. No longer was scientific scholar committed to the presuppositions of earlier philosophers. Sometimes a scholar of this later breed distinguished themselves equally in the religious and the rational sciences—such as Kamal al-Din ibn Yunus of Mawsil, and sometimes he held an office in a religious institution (like Ibn Shatir). In many cases he was an expert on *fiqh*, or grammar, or Qur’anic sciences, or all of these. In almost every case he had undergone a thorough Muslim education.<sup>11</sup>

These are the three phases of naturalization of Greek (Hellenistic) philosophy and science by Muslim scholars. Afterward, the naturalization of science took place in the Western world, where Islamic philosophies and sciences were “Westernized,” after their translation into Latin and Hebrew in the twelfth century, in the so called “secularization” of science.

## II. The Secularization of Science: A Challenging Problem

By word secular, from which the word secularization derives, I mean a worldview that concerns only with worldly life, and consequently neglects the hereafter. From the ontological point of view, it emphasizes the material and neglects the spiritual. Therefore, by the secularization of science, I mean the process of putting aside all the spiritual aspects from the objects of science, scientific theories and activities, which, in the classical periods, became the integral parts of scientific view.

The secularization of science, as a form of naturalization of science, as far as I can see, took place in the West after the age of renaissance, when Western society became secular as the consequence of thought development there. Few centuries before this (around the twelfth and thirteenth centuries), Western scholarship was very much influenced by Islamic scholarship, especially after the translation of Islamic scientific and philosophical works into Latin and Hebrew. Therefore, the science developed in there was still pretty much religious

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<sup>9</sup>*Ibid.*, p. 85.

<sup>10</sup>*Ibid.*, p. 86.

<sup>11</sup>*Ibid.*, p. 86

in nature, or at least highly motivated by religion. However, after the renaissance era (from the fourteenth century on ward), there happened the so-called “revolution in scientific fields” in a peculiar way, so that it tended increasingly towards secular view, and gradually put religious view aside. In the end, this new scientific view did not get along with religion, and even, in certain cases, contradicted religious dogma.

In the scientific and philosophical fields, there happened what Prof. Nasr called a philosophical doubt, that is, a doubt toward the validity and authority of philosophy as the conveyer of truth. Philosophy was suspected and metaphysics was gradually discarded, just to be replaced by William Ockham and his followers with the so-called nominalist theology.<sup>12</sup> Secularization of science, thus, took place in traditional cosmology especially Ibn Sina’s. “Cosmology,” for Ibn Sina, “was closely connected to angelology. The Universe was populated by angelic forces, a view which accorded perfectly well with the religious conception of the world. The spiritual agent in the form of angel was an integral and real aspect of cosmic reality.”<sup>13</sup> As it spread in the west, however, Ibn Sina’s cosmology, although accepted in outline, was criticized by men like William of Auverge who wanted to banish the angels from the universe. By neglecting the souls of heavenly bodies (spheres), firmly believed by Ibn Sina, these scholars had, to some significant extent, participated in secularizing the universe and in paving the way for the Copernican revolution. This revolution, according to Nasr, “could, in fact, only had occurred in a cosmos from which the symbolic and spiritual meaning had been removed; a cosmos which had become sheer fact drawn away from the bosom of metaphysics and made the subject of a purely physical science.”<sup>14</sup>

Generally speaking, the Copernican Revolution had a very great impact on secularization, or more accurately on the profanation of the previous world view. The idea that the sun was in the center of the universe (or more accurately the center of solar system), was not actually very new idea, for it had been known by certain Greek, Muslim, and Hindu thinkers. But the proposal of this idea in the Renaissance era, without being followed by a spiritual world view, will only mean the dislocation of human position in the cosmos since this new astronomical system had removed human position as “the Divine image” from the center of the universe. It is, by removing human position from the center of everything, that this new astronomy removed from man his transcendent nature. Instead, it affirmed the lost of his theomorphic qualities, for the sake of which he was put in the center of the universe. As a result, with the Renaissance, Europeans had lost what Nasr called the heaven of the faith era to get, as its replacement, the newly shaped earth and the natural forms. But this is a nature which becomes less as a reflection of a celestial Reality. The people of Renaissance became a fully human, not half-human and half-angel, but completely bound up to the earth.<sup>15</sup>

This is the general picture of what had taken place, as result of naturalization of science by European people in the form of secularization. This of course went along with their current world view which increasingly tended towards secularism. With this general picture, I would like to describe more specifically the process of secularization, both from methodological and theoretical perspectives. Let us begin with the first: the secularization of scientific methods. Since the Hellenistic or post-Aristotelian times up to the Golden Age of Islam and Christian scholasticism, the scientific explanation had always included the four Aristotelian

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<sup>12</sup> Nasr, *Man and Nature: The Spiritual Crisis of Modern Man* (London: Mandala Book, 1976), p. 63.

<sup>13</sup> *Ibid.*, 62

<sup>14</sup> *Ibid.*

<sup>15</sup> *Ibid.*, 64.

causes. For Aristotle, as G.B. Kerford puts it, “to know is to know by means of causes, and it is clear that the four Aristotelian causes are necessary elements in things, which must be known or understood if full understanding is to be reached.”<sup>16</sup>

This paradigm seemed to be fully accepted and practiced by the Muslim philosophers and scientists from al-Kindi in the ninth century to Ibn Khaldun in the fifteenth century. The four causes are material cause, connected with matter, formal cause, related with the forms, efficient cause, related with the initiative of movement process, and final cause related to the purpose to for the sake of which something is formed. I firmly believe that this model of scientific explanations, that is, the four Aristotelian causes, had been accepted and practiced since Hellenistic times, the Golden Age of Islam and Christian scholastics of the twelfth and thirteenth centuries, just few centuries before Renaissance. This model started to shake and shiver only in the modern times, when Western scientists and philosophers discarded the formal and final causes and focused only on the efficient and material causes in their scientific explanation.

To show the process of the methodological change, first, I would like to discuss how the Aristotelian method of explanation—including the four causes—had been studied and practiced by Muslim philosophers and scientists. Here two great Muslim philosophers-scientists—al-Kindi (±866) and Ibn Khaldun (d. 1405)—will represent it. After this, I will discuss what Holmes Rolston calls “A revolution in explanations” by Western Scientists, wherein Aristotelian method (with its four causes) had undergone a radical change.

How important is the understanding of these (Aristotelian) causes for knowing an object of inquiry, it can be seen in al-Kindi’s statement in his *The First Philosophy*: “We have complete knowledge of every knowable only when we have obtained full knowledge of its causes.”<sup>17</sup> Every cause, according to al-Kindi, will be either matter or form or agent, i.e., that from which motion begins, or final i.e., that for the sake of which the thing is.<sup>18</sup> Therefore, when we acquire full knowledge on matter, form, agent and final causes, we will acquire full knowledge on its definition, while the nature of every definable object lies in its definition.

The Kindian tradition which then became the pattern or criteria of scientific investigation was followed almost universally by great Muslim philosophers—scientists, such as al-Farabi, Ibn Sina, Ibn Rushd etc. So also it was followed and applied consistently by Ibn Khaldun, the father of Muslim sociology, in what was called *‘ulum al-‘umran* or the science of culture. Ibn Khaldun once says: In order to know the nature of culture...we should know its formative causes or principles of it. By knowing its causes, our reason can know culture and its characteristics demonstratively, for knowledge of anything new, derives only from the knowledge of its causes: efficient, material, formal and final.

This paradigm and method of scientific explanation were continually preserved and developed by Muslim philosophers-scientists, even until the modern times, like Mulla Sadra (d. 1641) and contemporary one, such as Tabataba’i. Meanwhile, in the West, this Aristotelian paradigm had been fundamentally transformed. Holmes Rolston III calls this fundamental transformation in method of scientific explanation as a revolution in

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<sup>16</sup> See G.B. Kerford, “Aristotle” in Paul Edwards, *The Encyclopedia of Philosophy* (New York: Macmillan Publishing Co., Inc. & The Free Press, vol I, 1972), h. 157.

<sup>17</sup> *Ibid.*

<sup>18</sup> Alfred L. Ivry, *Al-Kindi’s Metaphysics: A Translation of Ya’qub Ibn Ishaq al-Kindi’s Treatise “On First Philosophy,”* (*Fi al-Falsafa al-Ula*) (Albany: State University of New York Press, 1974), p.56.

explanations when the fourfold Aristotelian scientific explanations were confined by the Western philosophers-scientists, including Newton, Hume and Jacques Loeb only to two causes: material and efficient causes. Meanwhile the formal and final causes were rejected, since according to them, these two last causes more incline to the “meaning”, than “facts,” thus they are more suitable to religion than science. This scientific revolution, according to Rolston, programmatically repudiated the formal and final categories for understanding and expanded material and efficient categories to do the whole work of explanation.”<sup>19</sup>

I call the change in this methodological field a fundamental reform, or even revolution, as Rolston calls it, for its impacts on further development of theoretical field-especially on the process of secularization of science-were very significant. This can be clearly seen in the secularization of theoretical sciences, such as astrophysics, biology, psychology and even sociology. Here I will discuss only briefly this secularization that had taken place in these sciences.

The influence of mechanical theory of Newton on the development of modern sciences was very great not only on physics, which became his paramount expertise, but also on other fields such as biology, psychology as well as sociology. The great success of Newtonian mechanical theory or law, had caused a French astronomer, Pierre de Laplace, feel unnecessary to mention God’s name in his great work on astrophysics, *Celestial Mechanics*, for, according to Him, in the theory of creation, God was nothing but a hypothesis, but a hypothesis that was no longer needed by the theory of modern astronomy.<sup>20</sup> Of course, this was the consequence of restricting scientific explanation only to efficient cause, understood here as movement and material cause, which are nothing but matter. The revolution in scientific explanation has resulted in putting aside God from any scientific explanation.

The same case holds true in the field of biology, especially as developed in the hands of Darwin. Like Laplace, who had discarded God from the theory of astrophysics, where God’s role of governing and sustaining the universe was replaced by mechanical law, so also *the origin of species* was no longer referred to as God’s creation, the external agent, but considered as mechanical products of the “natural selection.”<sup>21</sup> Like the mechanical law in physical phenomena, this natural selection was an exact and unchangeable law in the level of organic world. Here too, God was removed, as in Laplace’s astronomy, far away from scientific scene and his role as the creator of species (plants or animals) was replaced by a firm unchangeable natural law, called natural selection.

Beside these two disciplines (astronomy and biology), the impact of this revolution in explanations, can also be found in psychology. Like Laplace and Darwin, Sigmund Freud, the father of psychoanalysis, had removed God from scientific explanation in the field of psychology. Not only that, he also said that the belief in God was an illusion, for it did not come from reality but from unconscious human wishes.<sup>22</sup> The belief in God, as many other human activities and thoughts, was not a conscious and profound act, but it derived from unconscious motives or drives which very dominantly influenced human actions.

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<sup>19</sup> Holmes Rolston III, *Science and Religion: A Critical Survey* (Philadelphia: Temple University Press, 1987), p. 34.

<sup>20</sup> Bertrand Russell, *Science and Religion* (London: Oxford University Press, 1982), p. 58

<sup>21</sup> For further discussion on theory of natural selection and its role in the origin of species, see Jonathan Howard, *Darwin* (New York: Hill and Wang, 1982), pp. 22-30..

<sup>22</sup> Erich Fromm, *Psychoanalysis and Religion* (New Haven & London: Yale University Press), p. 13.

Actually the similar impact can be found in other fields such as sociology, as developed for example by August Comte and Emile Durkheim, or in the field of economics, as demonstrated in Marxist theory of economy. But it may be too long to discuss here as the purpose of its description here was only as an illustration of how great the impacts of this paradigmatic change had been in the theoretical and methodological fields.

It is enough for me to say in conclusion that the revolution in scientific explanation from the paradigm of Aristotelian causality to the Newtonian paradigm had caused great significant impacts, not only on the development of modern science, but, in our context, on the acceleration of the process of the secularization and profanation of science. For, when science chooses only two sorts of causes in the scientific explanation, that is, efficient and material causes (or even its later development, it chose only the efficient cause), it did not any more confer it to religion, but tried to abolish two other causes—formal and final. Consequently, science became more secular and profane and finally contradicted religion sharply.

### III. The Islamization of Science: An Answer

The term “Islamization of science” has been a confusing, or to certain extent, even “unpopular” term. It is confusing, since its proponents have different versions, understandings and methods about it, and unpopular, since it implies the relativity of science which so long has been considered universal and neutral, although this assumption is not fully right. According to Steve Fuller, this assumption is wrong, since it derives from a confusion to differentiate between media and message. “The message is still universal, but its media requires a more personal appeal.”<sup>23</sup>

In this paper, I will still use the term “Islamization of science” with certain qualifications. Firstly, the word Islam in “Islamization” should not necessarily be understood strictly as a doctrine whose references should be found literally in the Qur’an and Hadith. It should rather be considered more broadly from its spirit that should not contradict the fundamental beliefs of Islam, like belief in God, angel, the hereafter, as well as revelation (*wahy*). As for its sources, after the main sources—The Qur’an and hadith—they can come from different fountains—classical Greek, Persia, India in the past, or even the West itself in the present. According to me, Islam (or any religion) today cannot anymore confine itself exclusively only to its original sources, but it should be open to other “external” sources of the truth and wisdom as long as they do not contradict its fundamental doctrines. *Secondly*, the Islamization of science I offer here, is not merely “labelization” of science with the Qur’anic verses or hadith to justify a scientific discovery or theory, but more importantly it should operate on epistemological level, by trying first, to “deconstruct” the contemporary western epistemology, and then “reconstruct” an “Islamic” or alternative epistemology by critically cultivating the materials found in “Islamic Scientific Tradition”, built and developed for more than a millennium by Muslim philosophers and scientists. This epistemological reconstruct will include the ontological status of science objects, the classification of knowledge and scientific methods, which will answer the fundamental questions of any epistemology—what can we, as human beings, know and how do we know it. *Lastly*, this Islamization of science bases itself on the assumption that science is, and will never be neutral and value-free.

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<sup>23</sup> See Steve Fuller, “Humanity as An Endangered Species in Science and Religion” as presented in the International conference on Religion and Science in the Post-Colonial Era, in Yogyakarta 2003.

Our discussion on the naturalization of science has shown us that science has never been neutral. When a science developed in certain area, it was always formed in accordance with the cultural, ideological or religious values professed by local thinkers or scientists, hence the Hellenization of science, Christianization, and Islamization of science in the classic period of Islam, and then the westernization of it in the form of secularization of science by Western society. Therefore, it is natural, for me, that when from the western countries sciences were transferred to the Islamic countries, they have undergone “the naturalization”, that is, the process of adaptation and acculturation of science to the religious and cultural values thereof. It is this process of naturalization of science by Muslims in their own particular places that I mean by the “Islamization of science.” At least, that is what I understand by it. For even when the geographical barriers can be easily transcended in the so-called “era of globalization”, the spiritual geography, however, cannot be traversed just like that, since there is a sacred area that cannot be transgressed forcefully from outside.

Now, the question is what is the form of Islamization of science that I offer? Before I answer directly this question it is better to put forwards the background for the rise of the attempt of Islamization of science. Probably, this attempt will never be necessary if there were no secularization of science in the modern world. Again, the Islamization of science would not be so urgent, if this secularization of science did not create dangerous threats or even quite destructive attacks on the pillars of faith in God and the hereafter, in the hands of great modern scientists. But all these things did actually happen, and we as the believers feel threatened theologically by these secular scientific theories, whose influences have been so global. As a Muslim and religious intellectual and scholar, I have been called to answer these challenges brought about by the modern science to religion. Therefore, the Islamization of science as a form of naturalization of science should be done to minimize the negative impacts of secular science on—religious system and thus protect it from ruin.

As a religion, Islam actually encourages and supports very much the seeking and development of science. Many Qur’anic verses and prophetic hadiths that praise those who have knowledge to anywhere they can and for as long as they are alive. Beside, these religious supports and admonitions to seek and cultivate science had been greeted enthusiastically by Muslim scholars almost in every field known in their times. Almost all the fields were touched and explored except untouchable God’s essence which lies beyond human’s capacity to comprehend. In Islamic view, all Gods creations are none but His own signs. Studies on it, will mean study on God’s creative work, so it is hoped that a Muslim scientist who studies and explores the creation, will increase his faith and piety to Him. Even so, this boundless and timeless searching for knowledge should not be motivated for merely the sake of curiosity, but for another higher purpose. Prof. Nasr says not one of Muslim scientists who seek knowledge only for the sake of curiosity, but they do this to observe the trace of God (*vesligia Dei*).<sup>24</sup>

In addition to this, Islam did permit the differences of opinions/views inscientific matters, leading to the rise of various scientific theories in Islamic world. Even, a theory, which in the west had created so many reactions or criticisms from among Christian people, such as that of evolution, had been actually discovered and developed among the outstanding Muslim scientists such as al-Jahiz, *Ikbwan al-Safa’* with Miskawayh, and especially Jalal al-Din Rumi,<sup>25</sup>

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<sup>24</sup> See Nasr, *Introduction to Islamic Cosmological Doctrines* (Boulder, Colorado: Shambala Publication Inc., 1964), p. 74.

<sup>25</sup> See my parer on Rumi’s theory of evolution, as presented in the International Symposium of Jalal al-Din Rumi, in Istanbul Mei 9, 2007.

along side the creationist theories, provided that it does not contradict the fundamental principle of religion. However, if these theories contradict outright the principles of religion, such as their denial of God's existence, angel, hereafter and *wahy* (prophecy), Islam as a religion cannot and will not tolerate them, since they had deviated from the true scientific principle and ethos. Therefore, it is no wonder, if the Muslims, especially its intellectuals have given their various reactions to the western secular scientific theories, once they knew these theories well. These will include the attempts of the great Contemporary Muslim thinkers, such as Naquib Al-Attas, Isma'il R. Faruqi and S. H. Nasr to Islamize modern sciences. Recently, we can also see the similar attempts, such as done by Mehdi Golshani and Osman Bakar, in what they promoted as the sacred science.<sup>26</sup>

Let us now turns to the original question what kind or form of Islamization of science that I offer? Actually I offer a simple form of Islamization, but it works on epistemological levels: (1) On the system of classification of science, and (2) on scientific methods. On the classification of science, in principle, Islam allows the studies on any objects in various fields, from physics, mathematics to metaphysics, which only possible after we establish the ontological status of their objects. In the natural science, all branches of modern science become the valid and legitimate fields to include in Islamic sciences. There is no "taboo" in Islam to explore and investigate any physical objects, for only God's essence should not be investigated. The results of the modern science researches can be well accepted as a useful means to better know God's existence and greatness. But, a scientific theory that assumes that the physical world is an independent-ultimate reality, having no relation whatsoever with any higher realities, will never be accepted, for in Islamic perspective, all physical entities are but God's creation wholly dependent on, and closely related to, the divine powers and they act basically the signs for God's existence and greatness. Newtonian law of gravity, for example, is very well accepted; provided that it does not assume that this law can run independently from God's intervention (in any form) thus replacing God's role in governing the world, and consequently God was so easily put aside or removed from it as the unneeded hypothesis.

Actually, the law of gravity had been discovered by Abu Rayhan al-Biruni (d. 1041), a Muslim polymath of the eleventh century. His criticism of Aristotle's theory that the source of gravity was dual: heavens for fire and air, and the center of earth for soil and water, had made his theory very similar to that of Newton.<sup>27</sup> This discovery was substantiated by what al-Biruni calls "the gravity specific of elements" (*al-arkan*), which surely cannot be understood except by assuming (or more accurately affirming) the existence of gravity. However, while Newton and other modern physicists considered "gravity" as just one of independent natural forces, together with electromagnetic, weak force and strong force, Muslim thinkers, such as al-Farabi and Ibn Sina, considered these natural forces to have as their sources the supernal entities, such as the active intellect—as God's subordinate to govern or manage sub-lunar world—or souls of spheres or other heavenly bodies<sup>28</sup> that emanated ultimately from God.

So also with the theory of evolution, both geological or biological, is basically acceptable, as long as it does not assume that the moving force behind the evolution was independent or

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<sup>26</sup> See Golshani's paper on *Science and the Sacred* and its commentary by Osman Bakar as represented in the International Conference on Science and Religion, in Yogyakarta, January 3, 2003.

<sup>27</sup> Hakim Mohammad Said & Dr. A.Z. Khan, *al-Biruni: His Time, Life and Works* (Karachi: Hamdard Academy, 1981), p. 145.

<sup>28</sup> Herbert A. Davidson, *Alfarabi, Avicenna & Averroes* (New York & Oxford: Oxford University Press, 1992), pp. 76-77.

autonomous of the divine, like that of the natural selection thought of as an independent law by Darwin and has been responsible for an organic evolution, including the origin of species. Otherwise, as in Darwin's case, people can easily remove God as the creator of species (vegetable and animal). For, according to them, God's role as the creator had been replaced by the law of natural selection, exactly like in Laplace's case, where God's role as sustainer of the world has been replaced by mechanical law. In the Islamic world, the struggles of alchemists to transform a base metal to a noble one was based on the belief that the mineral substances have transmuted gradually or evolutionary. Here Muslim alchemists tried to "revolutionize" the process of gradual transmutation through a chemical engineering.

In the bigger scale the movement of this geological movement was justified and developed by the greatest Muslim Shi'ite philosopher, Mulla Sadra, in his doctrine of "the trans-substantial movement" (*al-haraka al-jawhariya*). According to this theory the universe has moved not horizontally but vertically toward a higher level without leaving its previous elements. In Mulla Sadra's philosophy, however, we know that these vertical movements will come to an end only when they have reached the level of their archetypal realities in the spiritual plane to finally return to the Divine presence.<sup>29</sup> Therefore the Sadran theory of evolution in the form of trans-substantial movement does not discard its transcendent principle. This is of course different from the theory of evolution proposed by Henry Thomas Huxley and Charles Darwin. So also the theory of evolution in biological level has been found and developed even supported by Muslim thinkers, such as al-Jahiz, Miakawayh, Ikhwan al-Safa' and Jalal al-Din Rumi. Like his European friend Darwin, Rumi also believed in evolution. Again, like Darwin who had discovered "the fundamental force" responsible for the biological evolution in the law of natural selection, Rumi also discovered the similar force in what he called *'ishq* (love).

However, unlike Darwin who believed that this natural selection was an autonomous natural law (in the sense of having no connection whatsoever with any supernatural force), Rumi, conversely required the existence of this supernatural force as the central part of his theory, for, if love (*'ishq*) was the fundamental force responsible for evolutionary movement, is it possible that love exist without the beloved. Therefore it is obvious; according to Rumi that there will be no evolution without love, but similarly clear there will be no love without the beloved.<sup>30</sup> Therefore God as the beloved (*al-ma'shuq*) is the condition for the existence of love (*'ishq*), while love, in turn, becomes the condition for the existence of evolution. Therefore, so important is the role God plays, that without Him, there will never be no evolution.

Actually the same cases hold good in other fields, such as psychology and sociology. But it will be too long in Islam, immaterial entities are never be separated from science, more than that, it is even considered as an integral part of it. These immaterial entities are put hierarchical order culminating in the first cause, God. Therefore, the studies outside of physical fields, such as cosmology and other metaphysical fields become extremely important since without them, theories in physical sciences will not be understood properly, and will not be complete. For instance, psychology, which in Ibn Sina's system of classification of science belongs to physical sciences, will not be complete and well understood without metaphysics of emanation.<sup>31</sup> According to him, human reason (*'aql*) will not reach its

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<sup>29</sup> Nasr, "Mulla Sadra: His Teachings" in Nasr and Leaman. *History of Islamic Philosophy*, vol. I, p, 649.

<sup>30</sup> Further discussion on Rumi's theory of evolution, see Mulyadhi Kartanegara, *Menembus Batas Waktu* (Bandung: Mizan, 2002), p.26-27.

<sup>31</sup> Davidson, *Alfarabi, Avicenna & Averroes*, p. 82.

actuality until it has a contact (*ittisal*) with the active or agent intellect (*al-'aql al-fa'al*). This active intellect in Ibn Sina's cosmology is considered as the tenth or the last immaterial intellect in the series of immaterial intellects emanate from God. Likewise, human souls and their mental faculties, cannot be considered as ultimately physical forces as believed by modern neurologists as merely neurological function of the brain, but an immaterial substance in itself and therefore immortal .

However, it is studied as a part of physical science so far as the soul is in the physical body during its worldly career.<sup>32</sup> Since the soul itself is immaterial (*mujarrad*) to survive the physical death, and will continue its spiritual journey until reaching its goal: be in God's presence. To describe the fate of the soul after its physical death, there had been a scientific branch, specifically designed for it, called "eschatology" (*al-ma'ad*) which belongs to the metaphysical sciences.

This is more or less the form of Islamization of science that I can envisage in the theoretical level. Now, let us turn to the Islamization of science in the methodological level. When the study of Islamic science is not limited to the physical entities, such as happening in the modern science, but extends to the non-physical entities too, like mathematical and metaphysical, the Muslim thinkers and scientists were under constrains. To create not only scientific methods suitable to physical entities, such as observation and experimental methods (*tajribi*), but also methods usable for non-physical entities/objects, both rational, like demonstrative method (*burhani*) or intuitive method (*'irfani*). We cannot for example, accept observation or calculation, that is mathematical method, but reject the other, such as done by Laplace when he said, "I mistrust anything but the direct result of observation and calculation." Of course we know that observation and calculation are very important and had been practiced by great Muslim scientists, especially al-Biruni and Ibn Haytham, who said that suitable scientific method for astronomical and optical researches, was the combination of experimental and mathematical methods. However, we should not stop up here, since scientific areas are not limited physical and mathematical fields only, but also metaphysical. Of course, this metaphysical field will necessarily need another method whose function cannot be fulfilled by either observation or calculation (mathematical) methods.

Therefore, scientific methods used in the Islamic sciences, should also recognize *burhani* (logical) and *'irfani* (intuitive) methods. *Burhani* (demonstrative) method had been developed so intensively and complexly that Muslim philosophers and scientists like Ibn Sina needed nine volumes in his greatest work *al-Shifa'* to discuss this *burhani* method. In connection with metaphysical investigations, this *burhani* method is very much needed not only to prove the existence of spiritual entities and their ontological status—as done by al-Kindi, Ibn Sina and Ibn Rushd in their attempt to prove the existence of God, but also to demonstrate rationally extraordinary occurrences such as *mi'raj* (ascension),<sup>33</sup> mystical experience, especially prophetic revelation (*wahy*). Therefore, this method is extremely important to support rationally our faith usually accepted dogmatically.

The *'irfani* (intuitive) method is also very much needed in metaphysical and religious fields, for through this method we are introduced not only to immaterial entities, such as done by demonstrative method, but more than that we are also ushered to "witness" by our own heart (intuition) of those things that so far we know by means of discursive knowledge.

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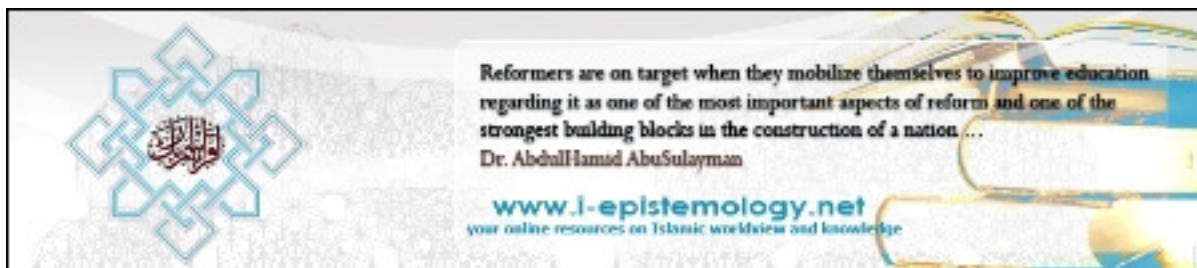
<sup>32</sup>See Fazlur Rahman, *Avicenna's Psychology*, pp. 5863.

<sup>33</sup> Ibn Sina wrote a book on *Mi'raj*, which he interpreted philosophically. See Henry Corbin, *Avicenna and the Visionary Recital* (Irving, Texas: Spring Publication, 1980), pp. 165-177.

Through 'irfani method, we are guided to experience and witness ourselves (mushahadah) metaphysical worlds so far hidden until through this method these hidden secrets, by God's permit, are revealed. In his work, *Risalat al-Anwar fima yumna Sabib al-Habwa min al-Asrar*, Ibn 'Arabi reveals his mystical extraordinary experiences through 'irfani method in the form of *dhikr*. Here, Ibn 'Arabi describes his "spiritual journey" from the material world ('*alam al-muluk*'), the imaginal world ('*alam al-mithal*') and spiritual world ('*alam al-jabarut*'). How he enters the mineral world with its various stones and metals introducing themselves to him with the medical and nutritive benefits that they have. He enters also into vegetable, animal and even imaginal and spiritual worlds and witnesses many unbelievable things such as paradise, hellfire, 'arash etc.<sup>34</sup>

Finally, 'irfani method is also very crucial in the frame of Islamic science, for it is through 'irfani method we can understand and thus justify the reality of prophecy in the form of revelation (*wahy*), as one of our pillars of the faith (*arkan al-iman*). Revelation is nothing but the peak or the highest level of mystical or 'irfani experience. For according to Farid al-Din 'Attar, the highest mystical experience is only the beginning of prophetic experience (*nubuwwah*).<sup>35</sup>

**In conclusion**, we come to realize that in the Islamized scientific view, both in the theoretical and methodological fields, Muslim scientists do not just study scientifically the physical entities of the universe, but also metaphysical realities, so that science can go hand in hand with religion. It will not, therefore, contradict the fundamental doctrines of religion, such as happening in the West. It will, conversely, justify and support wholeheartedly its sacred doctrines.



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<sup>34</sup> See Ibn 'Arabi, *The Journey to the Lord of Power*, translated by Rabia Terri Harris (New York: Inner Traditions International, 1981), pp. 36-38.

<sup>35</sup> Farid al-Din 'Attar, *Muslim Saints and Mystics*, Translated by A.J. Arberry (London: Routledge & Kegan Paul, 1966), p, 58.