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The Philosophy of Osman bin Bakar

Katherine Nielsen

This article examines the philosophy that Osman bin Bakar has published in English. Beginning with his biography and theoretical groundings, and especially the influences that Greek, Chinese, Indian, and Islamic philosophers have had on his thought, the article then turns to Bakar's philosophy of science, 'ilm al-tawhīd, how knowledge about the world should be classified, and especially evolutionary theory within Islamic philosophy. These developments in philosophical grounding provide Bakar with a platform to suggest how science can be used as a vehicle for inter-civilizational dialogue.

1. Introduction

Osman bin Bakar is one of the foremost contemporary Muslim philosophers of science. Publishing in English and Malay, Bakar draws on all major pre-modern civilizations to develop what he calls 'ilm al-tawhīd, or the Science of Divine Unity, which he considers to be universal in both nature and scope. Bakar contends that developing 'ilm al-tawhīd is one of the steps that can help in inter-civilizational dialogue, offering a common starting point. This article will examine Bakar's life and works, his theoretical background, his philosophy of science, and how they relate to his other great interest, inter-civilizational dialogue between modern cultural blocs. In this article I will explore his English works only as, being written in English, they are designed for a Western audience, and speak to that audience about his view of 'ilm al-tawhīd and the role it can play in inter-civilizational dialogue, a dialogue in which he wishes to include the West.

2. Biography

Beginning his post-secondary studies in England, Bakar completed his Honours undergraduate degree and his Master of Science in mathematics, specializing in algebra, at the University of London. Arriving in the United States in 1981, Bakar then

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completed his Master of Arts in Comparative Religion and his PhD in philosophy of science and Islamic philosophy at Temple University. As a doctoral candidate, Bakar studied under the supervision of Seyyed Hossein Nasr, a man whose thought permeates Bakar's work.

Bakar is currently a professor at the International Institute of Islamic Thought and Civilization, International Islamic University, Malaysia and was formerly the Malaysia Chair of Islam in Southeast Asia within the Center for Muslim-Christian Understanding at Georgetown University in Washington, DC. Bakar has also held the position of Deputy Vice-Chancellor and Vice President of Academics and holds the chair of philosophy of science at the University of Malaya in Kuala Lumpur. While at Georgetown, Bakar taught courses on 'Contemporary Islamic Thought and Movements in South East Asia', 'Intercivilizational Dialogue in Southeast Asia', and 'Religion and Science in Islam'.

3. Philosophical Corpus

From the outset, Islamic philosophers have striven to reconcile the world revealed in the Qur'ān and the physical world that humanity inhabits. Drawing on the previous scientific work encountered during early periods of geographic expansion, such as the Greek, Byzantine and Indian traditions, Islamic philosophy of science has developed through the following stages:

- (i) a formative period under the shade of Islamic religious sciences;
- (ii) a quick maturation through the massive infusion of data, information and theories from the Greek, Indian and Persian traditions;
- (iii) a phase of careful assessment, recasting and Islamization of the received material;
- (iv) the gradual realization that there was something fundamentally wrong with some of the major concepts that had been received from other traditions;
- (v) appearance of 'doubt literature', which pinpointed major scientific and philosophical problems with the received material and suggested fundamental changes; and
- (vi) a slow process of withering (Iqbal 2002, 60).

This scientific development was made possible through the establishment of Arabic as the lingua franca of the region, allowing philosophers quickly and easily to transmit ideas between different regions of the globe, and to build on discoveries made elsewhere (Iqbal 2002, 84). As European colonial expansion reorganized the Islamic world, new discourses relating to science developed which were seen not as part of the overall philosophical tradition, as earlier debates had been, but rather as something foreign, based in Western cultural assumptions, which had to be discussed under the heading of the relation 'between Islam and modern science' (Iqbal 2002, 203). In the modern period, three standpoints have developed in response to these new discourses: (1) the view that modern science is guided not by moral value but by naked materialism and arrogance and is therefore un-Islamic and undesirable; (2) a reconstructionist tradition which argues that the world of God cannot be wrong, but also that the truths of science are manifest and real; and finally (3) the view that Islam and science are fundamentally

unrelated and therefore cannot be in conflict (Hoodbhoy 1995, 16). Bakar has positioned himself squarely within the second philosophical response to science.

The reconstructionist tradition is currently championed by Seyyed Hossein Nasr, who does not value science for its own ends, but rather sets out science as a means better to understand the human condition. For example, Pervez Hoodbhoy rightfully notes that, for Nasr, 'knowledge for the sake of knowledge is declared to be a dangerous and illegitimate goal, and the only form of legitimate knowledge is that which leads to a greater understanding of the divine' (Hoodbhoy 1995, 17). While deeply influenced by Nasr, Bakar uses this philosophical position to legitimize his claim that as a universal activity, all civilizations seek to develop this 'greater understanding of the divine' through scientific research. Therefore, it is through science, for Bakar, that dialogue between civilizations is possible. This dialogue is desirable because it would allow humanity to join together in common activity, namely in understanding God. This effort is best articulated through Bakar's work, and, it can be argued, may be the chief aim of Islamic philosophy of science in the modern period. For example, Muzaffar Iqbal claims that 'it is the triumphant force of modern science that seeks to replace all worldviews other than its own which needs an urgent and creative response by all religious traditions, most of all for Islam' (Iqbal 2002, xxii). This is certainly reflected in Bakar's philosophy. Bakar draws on the traditional school of philosophy in his own work, especially on the central Islamic conception of the Unity of God, *tawhīd*, which postulates that 'the realm of nature becomes a sign (*āya*, pl. *āyāt*), which points to a transcendent reality beyond itself, precisely the unicity of God (Iqbal 2002, 29). This is wholly in line with Nasr's philosophy, which considers modern science to have 'illegitimately divorced humanity from its spiritual roots, and as a result brought into existence an atomised concept of both science and humanity' (Leaman 1999, 54). Nasr calls for a reintegration of religion and science in his *Scientia sacra* where both the intellect (science) and the heart (religion) must work together in order to fully understand the physical world. For example, Nasr asserts:

that the twin source of this knowledge is revelation and intellection or intellectual intuition, which involves the illumination of the heart and mind of man and the presence in him of knowledge of an immediate and direct nature which is tasted and experienced, the sapience which the Islamic tradition refers to as 'presential knowledge' (*al-ʿilm al-hudūrī*). Man is able to know, and this knowledge corresponds to some aspect of reality ... knowledge is knowledge of Absolute Reality and intelligence possesses the miraculous gift of being able to know that which is and all that partakes of being. (Nasr 2007, 131)

For Bakar, once this unity of religion and science has been manifested, humanity will be able to come together as a unified community, and his inter-civilizational dialogue is one of the means through which this can be accomplished.

Bakar edited a book titled *Critique of Evolutionary Theory*, which included his essay, 'The Nature and Extent of Criticism of Evolutionary Theory', which he had written as a graduate student at Temple. The collection was intended to provide, in one source, 'a broad range of criticisms of the modern theory of evolution: logical, mathematical, physical, biological, religious, philosophical, and metaphysical'. Bakar claims that the

overall aim of the book is to convey to as wide an audience as possible the understanding that ‘contrary to what many scientists think, the alternative to evolutionary theory need not necessarily be any of the different forms of creationism that are in vogue today in many religious circles’ (Bakar 1987a, v). Rather, the contributors present a ‘traditional doctrine of the gradation of beings’ in order to understand the universe around us.

‘Classification of the Sciences in Islamic Intellectual History’ was originally written in 1988 as a doctoral dissertation under the supervision of Seyyed Hossein Nasr. It was published under the title *Classification of Knowledge in Islam* in 1998. In his introduction to Bakar’s book, Nasr identifies Bakar’s work as one of the original scholarly books on Islamic philosophy of science in English (Bakar 1998, xi). Nasr defends Bakar’s choice of philosophers, as there were many to choose from for this discussion, and sets Bakar’s work within the emerging field of the ‘Islamization of knowledge’ because of his grounding in both Western philosophical and Islamic intellectual traditions (Bakar 1998, xiv). This is one of the key works to understanding Bakar’s philosophical grounding. One of the central criticisms of this work is offered by Oliver Leaman:

I think he takes too seriously the idea that all thinkers involved regarded knowledge of God as the highest form of knowledge, and that their specific religious views dominated their arguments on this topic. Naturally they would all claim that knowledge of God is the highest knowledge, but by what is important is what this means, and it means something very different for the three thinkers. No doubt they were motivated to come to particular theoretical positions but their general views on the relation between faith and philosophy, but this plays no direct part in their actual reasoning, and it is this to which we should draw attention. To give him credit, this is exactly what Bakar does in this helpful book. (Leaman 2000, 211)

In 1991, Bakar published a collection of essays entitled *Tawhid and Science* (Bakar 1991) which was later republished as *The History and Philosophy of Islamic Science* (Bakar 1999). In it he reproduces several articles that had been published in scholarly journals and includes some new chapters, all relating to the theme of *tawhīd* in science. Islamic science, for Bakar, encompasses all the contributions that Muslims have made through history to the fields of mathematics, the natural sciences, and the cognitive sciences. These sciences are called *Islamic* when they are related to or based in the fundamental teachings of Islam on a metaphysical, cosmological, ethical, and moral level. One such principle, which permeates Islamic sciences, is the conception of *tawhīd*, or unity (Bakar 1991, ix). Bakar divides the essays in this collection along four themes: 1) The Epistemological Foundation of Islamic Science; 2) Man, Nature, and God in Islamic Science; 3) Islamic Science and the West; and 4) Islam and Modern Science. This is Bakar’s attempt to synthesize his earlier work relating to the Islamization of knowledge, published as journal articles, into one authoritative guide on how to achieve such a new synthesis. John Walbridge concludes his review of the book by pointing out that there may be a real cost to such a programme in that ‘it’s easy enough to add classes on Islamic ethics and Islamic art to an engineering curriculum, but where do you go next?’ (Walbridge 2001, 275). Bakar is unconvincing in terms of an overall Islamist programme, but may have had some new ideas after becoming an administrator in an Islamic university in Malaysia. This Islamization programme notwithstanding, this

book expertly details the development of the reconstructionist thread of the traditional school in Islamic philosophy of science.

In Nasr and Leaman's edited work, *History of Islamic Philosophy*, Bakar contributes the chapter on 'Science', analyzing science as a branch of philosophy within the Islamic tradition. In this essay, Bakar explicitly defines Islamic science as 'that domain of knowledge traditionally covered under the disciplines known to Muslim scholars as (1) mathematical sciences (*'ulūm al-ta'ālīm*, or *al-'ulūm al-riyādiyyah*) such as arithmetic, geometry, astronomy, and music, and (2) natural sciences (*al-'ulūm al-tabī'iyyah*), including physical sciences, biological sciences and cognitive sciences (faculty psychology)' (Bakar 1996, 926). These disciplines have been the domain of Islamic philosophers since the formative period of Islam, and contributed to a growing *shukūk* or doubt literature, which translated, interpreted and further developed scientific treatises from the Greek, Persian, Byzantine, Indian and Turkish scientific traditions (Iqbal 2002, 6).

Bakar has published further works, both in English and Malay. Due to the constraints of our scope and language, the works discussed in this article are those relevant texts that provide a coherent sketch of Bakar's *'ilm al-tawhīd* and its implications and benefits for the development of inter-civilizational dialogue. This work is based primarily on Islamic foundations in the traditionalist philosophical school, but Bakar has considered contributions to science from other civilizations as well, developing a unity for his own science from his research on the philosophy of science from other major civilizational endeavours in the modern and historical periods.

4. Theoretical Grounding

To develop his own approach to philosophy of science, Bakar employs philosophical schools of thought from other civilizations, especially the Greek, Chinese, Indian and Islamic traditions.

Greek civilization: Platonism and Aristotelianism from Greece have been influential in Bakar's development of *'ilm al-tawhīd*. Although originally developed in classical Greek thought, many Jewish, Christian, and Muslim scientists and philosophers have built upon early Greek work, such as Maimonides, Aquinas, al-Kindī, al-Fārābī, and Ibn Sīnā (Bakar 1997a, 84). These thinkers employed such ideas as Platonic archetypes, Aristotelian ideas of form and matter and causality using rational logic (Bakar 1997a, 86). Greek Hermeticism was also particularly useful, for example, within the field of alchemy. Bakar highlights the interactions of religion and science when he states that, for example:

As a spiritual science, it [alchemy] deals with the soul and its transformations and is therefore very closely related to psychology. In fact, one of the aims of traditional psychology is to study the processes of spiritual transformation of the soul, which al-Ghazzali appropriately called 'the alchemy of happiness'. As a physical science, alchemy deals with the chemistry of elements and metals and with their technology like the one produced by medieval artisans and craftsmen, as well as with their symbolism or spiritual significance. (Bakar 1997a, 88)

These alchemical ideas continued to be popular and are reflected in the work of Isaac Newton and Carl Jung (Bakar 1997a, 89).

Chinese civilization: Chinese civilization also made significant contributions to what Bakar calls Universal Science. It contributed technological developments such as paper and the magnetic compass, but there was also a sense of unity in Chinese science that is important. Through the metaphysical concepts of *yin* and *yang* the universe is considered to be produced and reproduced in a balance between two opposites. At the same time, a *ch'i*, or life force, sublimates the entire universe (Bakar 1997a, 90). These assumptions guided Chinese scientists and philosophers in their understanding of the world around them. The Chinese developed their own sciences such as mathematics, astronomy, alchemy, and medicine (Bakar 1997a, 91).

Indian civilization: Indian civilization provided ideas about the nature and structure of reality in terms of how it was created, why it exists as it does, and what is to come in the future, which were of importance to Islamic science. Indian scientists developed the number zero in mathematics from the idea of nothingness in the Hindu tradition. They also produced detailed calendars for the purpose of observing their religious celebrations. Complementary to the idea of nothingness, the Indian conception of wholeness influenced the development of medicine by treating not only the obvious physical ailment, but also considering the whole body and the influence of other factors in causing the illness (Bakar 1997a, 91).

Islamic civilization: The three philosophers on whom Bakar chooses to focus in his dissertation are al-Fārābī (258/870–399/950), al-Ghazzālī (450/1058–505/1111), and Qutb al Dīn al-Shīrāzī (634/1236–710/1311). They were chosen because he considered them to be eminent thinkers in their respective schools and they were very influential on other philosophers and the development of Islamic philosophy of science broadly. Al-Fārābī is the founder of the *mashshā'ī*, or Peripatetic, school of 'philosopher-scientists'. Al-Ghazzālī was a famous theologian and jurist. Al-Shīrāzī was a scientist within the *ishrāqī*, or Illuminationist, school of philosophy. They worked at intervals of a century, and built on previous works. It should be noted, therefore, that al-Fārābī was working at the beginning of intense philosophical and scientific activity, whereas al-Ghazzālī worked in a period of greater tension. Al-Shīrāzī worked during the fall of Baghdad to the Mongols, which resulted in the destruction of a major intellectual centre (Bakar 1998, 2).

By examining the life and works of these three thinkers, Bakar hopes to determine if 'these developments and changes had affected or influenced in any significant manner the foundational basis and structure of the classifications under study, written as they were under different philosophical and religious climates'. Bakar's thesis is that 'the classifications are based at once upon philosophical ideas which are common to all intellectual schools in Islam and ideas which are specific to the intellectual and religious world-view of its author and of the school he represents' (Bakar 1998, 3). Within this framework, Bakar identifies *'ilm*, science, which is at the centre of his work and thought throughout his career, as 'an organized body of knowledge that constitutes a discipline with its distinctive goals, basic premises, and objects and methods of inquiry', a definition broader than that of modern science (Bakar 1998, 5).

Many of these civilizations used religious literature as the basis for cosmological understanding of the universe around them. For the Egyptians, the *Book of the Dead* outlined the Egyptian understanding of the metaphysical realms. The works of Pythagoras, Plato, Aristotle, and their students have been translated and preserved over the centuries within the Islamic philosophical tradition. Both the Old and New Testaments of the Bible have influenced many Christian thinkers just as the Torah has Jewish philosophers. The *Daode jing* (*The Way and Its Virtues*) and the *I jing* (*The Book of Changes*) deeply influenced Chinese thought. The Rg Veda and the Upanishads are just some of the texts that influenced Indian scientists. While building on the works and accomplishments of all these civilizations, Islamic scientists were also influenced by the Qur'ān and Hadith. As a result, Science was used in the Islamic tradition 'to reaffirm such perennial truths as Divine Unity and the consequent principles of the Unicity of Nature' (Bakar 1997a, 92). As a result, it can be seen that all 'traditional sciences share not only common goals but also hierarchic picture of the universe and common epistemological principles' (Bakar 1997a, 94).

Bakar concludes his book on inter-civilizational dialogue by engaging with the larger debate regarding the role that the sciences should play in contemporary society, outlined by Iqbal's question: 'What avenues are open for non-Western cultures to preserve their cultural and spiritual values in the face of a rapid penetration of an alien tradition through modern science? This is the question that is especially important for the Muslim societies' (Iqbal 2002, 295). There is still a need to explore the potential of Islamic contributions to the fields of medicine, science education, the arts, and social commitment. For example, in the field of medicine, Bakar advocates a re-examination of traditional medicine and a holistic approach to patient care (Bakar 1997b). This falls into Bakar's Islamization of knowledge programme:

A resuscitation of the glories of the achievements of the Muslim societies as a nostalgic exhibit of a heritage that can be displayed in museums and enacted in scholarly texts: it means a wholesale reorientation of the society away from the colonized mindset, with a conscious centripetal move toward the living fountain of the tradition that would transform both the inward and the outward aspects of contemporary Muslim societies. (Iqbal 2002, 13)

Bakar's Universal Science is not the same as the internationally-recognized 'modern' science of the present-day period. This is because, for Bakar, modern science is built on the assumptions and conclusions not of all traditional sciences, but just that of the West, which has separated itself from its religious and philosophical influences (Bakar 1997a, 93). Bakar even goes so far as to say:

The myth of the neutrality of science in relation to cultural values has long been shattered by numerous excellent works on the history and philosophy of science. Scientific and technological development is greatly influenced by beliefs, be these religious, anti-religious, philosophical or ideological, and by cultural and socio-economic factors. Therefore, there is a need to make a careful distinction between universal values and virtues and values and virtues that are unique to a particular religion, culture, or ideology. (Bakar 1997b, 109)

This reflects Nasr's position on the secularization of Western science, which is 'an anti-thesis of all that is sacred in nature ... Certain developments within modern science have opened a niche for understanding its own limitations and perhaps the day is not far away when those who pursue knowledge of the unseen real will not be seen as quaint relics of a lost world' (Iqbal 2002, 308–309). In order to achieve this, Bakar calls 'for the surviving spiritual traditions, especially the major ones like Hinduism, Buddhism, Christianity, and Islam, to formulate a common philosophy of nature for the modern world so as to provide a way out of the present predicament brought about by modern science and technology' (Bakar 1997a, 95). This is precisely what Bakar aims to do through his work on *'ilm al-tawhīd* and inter-civilizational dialogue.

5. Bakar's *'Ilm Al-Tawhīd*

According to Bakar, Islamic science did not really begin until the translations into Arabic were completed of older, pre-existing scientific texts, such as Greek, Persian, and Indian texts on philosophy, science, and medicine (Bakar 1996, 927). Calling them 'Muslim philosopher-scientists', Bakar states that these translators were interested in classifying the sciences within a hierarchy of knowledge while, at the same time, developing and creating new knowledge of the world around them (Bakar 1996, 930). It is this topic of classification with which Bakar occupied himself in his doctoral dissertation. In his later essay titled 'Science', Bakar explores the classifications of al-Kindī, al-Fārābī, Ibn Sīnā, al-Ghazzālī, Ibn Khaldūn, and Ibn Haytham.

Science, for Bakar, is not simply the observation and experimentation of Western science, but also involves logical thinking, mathematical analysis, and the rational interpretation of all sacred books (Bakar 1996, 941). There are, therefore, many sources of knowledge, which can be approached through a variety of methodologies. However, science, by its very nature, must be useful. Therefore, science is done not for its own sake, but for the betterment of life and understanding of the world around us. As a result, science is 'useful in the quest for the perfection of the soul, which is a necessary condition for happiness in this world and in the life hereafter' (Bakar 1996, 943). It is, therefore, the obligation of every human being to engage in science, at least on some level, in order to develop their soul and gain happiness. This view certainly draws on Nasr's philosophy:

The truth descends upon the mind ... it gushes forth and inundates the mind like a deep well which has suddenly burst forth into a spring ... the sapiential nature of what the human being receives through spiritual experience is not the result of man's mental faculty but issues from the nature of that experience itself. Man can know through intuition and revelation ... because knowledge is being. (Nasr 2007, 131)

The ultimate goal, then, is becoming full human beings, where all individuals must develop themselves and their own awareness in order to understand the world and our place in it.

For example, in relation to his position on evolutionary theory, Bakar claims that the impulse to create such a work derives from the intolerant attitude of the scientific

community towards other notions of evolution, especially considering that this theory has not been proven conclusively and that evidence exists which contradicts it (Bakar 1987b, 1). Bakar claims that, in light of this:

Truth cannot be arrived at and realized if our minds are systematically and routinely exposed to only errors and false ideas, more so when disguised as truths, and if the mental climate and accepted intellectual norms is such that we can only choose the most attractive of these errors and false ideas. This is a sure way to intellectual reduction and decay. (Bakar 1987b, 2)

Therefore, the aim of his essays is not to undermine the current scientific consensus, but to ‘enhance and preserve it’ in order to maximize our awareness of the physical world (Bakar 1987b, 3). Evolutionary theory, rather than any other area of science, was chosen as a case for debate because it ‘permeates modern Western thought’, thus contributing to Bakar’s overall scheme to foster inter-civilizational debate through philosophy of science (Bakar 1987b, 10).

In his personal contribution to the work, Bakar draws four conclusions about evolutionary theory, which highlight Bakar’s position of science (Bakar 1987c, 140):

1. Since its inception, evolutionary theory has always experienced criticism from within the scientific community.
2. Evolutionists have used unscientific methods to prove and preserve their theory.
3. Starting in the 1950s, opposition to them has increased dramatically.
4. Some scientists have experienced doubt about the usefulness of this theory for understanding and developing the discipline of biology.

As one can see, Bakar is not attacking evolutionary theory in support of a religious understanding, but rather points out that there are many ways of learning and knowing about the world around us. The difficulty lies in the application of such an analysis to Bakar’s programme for the Islamization of knowledge, and in the case of science as well. Walbridge is correct to point out that the ‘Islamization of science has brought out charlatans, cranks, and well-meaning naifs in alarming numbers. Bakar is particularly vulnerable to this since his “traditional science” commits him to taking medieval Islamic science seriously as something more than a source of communal pride’ (Walbridge 2001, 275). For example, revealing the ‘unscientific’ methods used in the evolution debate does not necessarily invalidate the theoretical position. Simply drawing on medieval Islamic philosophy cannot resolve this debate. A serious re-examination of how Islamic philosophy of science engages with Western scientific debates is also required.

For Bakar, Islam is both a way of acting and a way of knowing in the world (Bakar 1991, 1). One of the most important principles influencing this way of being is the notion that ‘There is no god but God’ (*Lā ilāha illa’ Llā*). This Divine Unity, or *Tawhīd*, is the basis for Bakar’s Islamic science in that philosophers are looking for the truth of the world through an understanding of this unity (Bakar 1991, 1). It is hoped that, through understanding *tawhīd*, one can ‘affirm the truth that God is One in His Essence, in His Attributes and Qualities, and in His Works’ (Bakar 1991, 2). Within the Islamic tradition there is a belief in the interconnectedness of reality which has both a

unity and laws that govern it. Bakar contends that, through a truthful and objective exploration of the world around us, therefore, we can come to know God.

Along with this Islamic notion of *tawhīd*, Islamic science is also influenced by the conception of *i'tidāl*, or equilibrium. All paths to developing knowledge and understanding are to be valued, and function together to develop a clear and complete vision of the universe (Bakar 1991, 5). There are, however, degrees and gradations of truth, and of ways of coming to that truth. Some techniques are better than others for understanding the absolute truth (*al-Haqq*) of both the world and of God. Science is a legitimate and valued technique to learning about *tawhīd* because it employs all five senses, as well as other faculties of human beings, such as memory, imagination, rational intellect, and spiritual faculties (Bakar 1991, 6). Therefore, while science in the West was inspired by scepticism in religion, at least in part, Islamic science was inspired by religion (Bakar 1991, 7).

One of the goals of science is to study the universe. Bakar considers the universe to have multiple levels of being, or existence, and as such, to exist within a hierarchy. Therefore, since the sciences are hierarchical as well, the relationship between human faculties and the universe is hierarchical in nature (Bakar 1991, 19). Therefore, '*ilm* or science 'sees the essences of things in relation to their Divine Origin' (Bakar 1991, 23).

The idea that pre-modern civilizations have cultivated the sciences was promoted in Bakar's treatises on civilizational dialogue, as discussed above. He claims that they differ from modern sciences in relation to their 'goals, methodology, sources of inspiration, and their philosophical assumptions concerning man, knowledge, and the reality of the natural world' (Bakar 1991, 61). Science can be a vehicle to spiritual knowledge. Bakar defines spiritual knowledge as 'knowledge of the world of the Spirit. In Islam this knowledge refers to the knowledge of the One, of God in His Unity' (Bakar 1991, 62). One result of this is that a link is developed between the Creator and His creation, namely between God and the world, and indeed between God and humanity.

While based on religious and philosophical understandings of the world, objectivity is essential to the process of Islamic science. Objectivity is both impartial and public in that anyone can seek to verify claims (Bakar 1991, 8). Verifiability is not, however, the absolute proof of correctness of conclusions, as there may be other discoveries in the future that may disprove, or call into question, the objective, empirical knowledge gathered up to now. For Bakar, this attempt to cultivate objectivity is a result of man's desire to emulate God. Since humans were created in God's image, they have the potential to emulate all of God's divine qualities (Bakar 1991, 10). Humans are therefore capable of objectivity because God endowed them with this nature, and not others, hence humans are called 'rational animals'. Humans are uniquely designed in this way to explore *tawhīd*. Science is inspired by their creativity as well as their rationality. We question the origins of our ideas, conceptions, and theories. We analyze and reduce our notions in a repeatable method, thereby developing knowledge and understanding of the world around us (Bakar 1991, 28). One of the ways we can do this is by studying the Qur'ān since the nature of the universe flows through the text and it exists as a link between humans and the universe (Bakar 1991, 31). For Bakar, the cultivation of the Muslim intellect depends on understanding and submitting to this principle.

Humans use their human intellect in this process of discovery. According to Bakar, the human intellect 'is of a spiritual substance whose source or principle is the Divine Intellect or the *Logos*, which is also the Principle of the macrocosm Universe, and the sources of the sacred Book, the Quran, which is the basis of religion' (Bakar 1991, 24). In this fashion, through coming to know about the world around them using their human intellect, humans also come to know themselves. Bakar divides the development of the human intellect into four stages (Bakar 1991, 27):

1. The attainment of habitual intelligence (*bi'l-malakah*). In this stage each individual acquires intelligence in his or her soul.
2. The actualization of the intelligibles (*bi'l-fi'l*). In this stage intelligence of the soul develops in the mind, and is sometimes called the actual intellect.
3. The realization of the actual intellect (*mustafād*). In this stage there is a complete understanding by the actual intellect and it becomes 'acquired intelligence'.
4. The supra-individual intellect. This intellect transcends all the ones previous to it, thereby making the process of intellectual actualization possible in the first place.

In relation to the Qur'ān, Bakar does not claim this religious text to be a scientific book. Rather, it provides the 'principles of science, which it always relates to metaphysical and spiritual knowledge' (Bakar 1991, 63). Nature is also a source of knowledge for science. For Bakar, the goal of Islamic science is to demonstrate in a concrete fashion the unity of the universe (Bakar 1991, 64). This is to be accomplished through metaphysics, which Nasr considers to be 'the ultimate science of the Real' (Nasr 2007, 131). Therefore, although scientific disciplines are necessary in order to develop specialized knowledge, they should also be integrated and provided with a sense of unity using all available avenues for understanding. In this light, 'scientific laws' are not in opposition to the 'laws of God' or the 'laws of nature' (Bakar 1991, 71). They work together to reflect the divine principles, or the *tawhīd*, of the universe.

Bakar explicitly discusses his idea of a cosmological knowledge as well. This form of knowledge can be found between the knowledge of *tawhīd* and specific scientific disciplines (Bakar 1991, 73). This cosmological knowledge is the human attempt to understand the world around us. Part of this world, for Bakar, is the universal soul (*al-nafs al-kulliyah*), the soul of the natural order, which he considers to act in relation to nature just as the human soul does in relation to humans. This universal soul 'animates the whole cosmos', generating life (Bakar 1991, 75). It was created by God and is one of the major forces to be studied by science.

6. Implications and Benefits for Inter-Civilizational Dialogue

Bakar divides his book, *Islam and Civilizational Dialogue* (1997a), into three parts: 'Islam's Encounter With Other Civilizations, such as the West, Buddhist, and Confucian Civilizations'; 'Islam and Asian Values and Asian Renaissance'; and 'Civilizational Dialogue in Various Domains of Human Life and Thought – Islam's Role and Contributions', which looks specifically at science. Believing that the Qur'ān, and especially Surah 5:51 and Bee 125, suggests the necessity of inter-civilizational dialogue, Bakar

views this dialogue as imperative since these civilizations live side by side and interact with one another. In this book, Bakar examines how this dialogue has gone in the past, what is happening now, and what should and could be done in the future.

Bakar sees the Muslim world, located on a land bridge between Europe, Asia, and Africa, as a link between civilizations whose position makes it an ideal mediator of inter-civilizational dialogue (Bakar 1997a, 7). This positionality was also fundamental in facilitating medieval Islamic philosophy of science (Iqbal 2002, 8). One example that Bakar highlights throughout his book as an area for civilizational dialogue is 'scientific culture' (Bakar 1997a, 9) as was manifested, for example, in Andalusia, Persia, and India, namely, areas of cultural interaction. Bakar sees science as a key to understanding other civilizations since all cultures seek to understand the world around them. The 'universals' which these actions produce become identified with *truth* and are considered to be *good* (Bakar 1997a, 11). Some of the key philosophers Bakar uses to defend this position are al-Fārābī and al-Ghazzālī, whom he also cited in his doctoral thesis.

Bakar explores Muhammad Iqbal's ideas regarding an Islamic Renaissance to explore and advocate an Asian Renaissance as well, similar to the European Renaissance in which a 'revival of classical learning' occurred (Bakar 1997a, 58). Again, science must play a key role in this revival. For example, Bakar claims that 'science is regarded as the key to human happiness when it is pursued for the sake of both truth and power', a more Western understanding of science (Bakar 1997a, 59). Within the Islamic tradition, *ijtihād* is employed to explore the nature of the universe. *Ijtihād* means 'creativity of the human mind' and 'to exert one's mind with a view to form an independent judgement on a legal question', but it need not be a legal question (Bakar 1997a, 61). The point is to use your rational and creative faculties to learn about the world around you, similar to the *shukūk* literature discussed above. Part of the Islamic Renaissance is an attempt to rid Islam of its cultural and societal traditions which have clouded or changed the original Islamic beliefs and philosophies developed in the medieval period through contact with the colonial world (Bakar 1997a, 62). The Asian Renaissance would involve the returning and valuing of Indian and Chinese, as well as Islamic, civilizations as authentic, valid, and valuable ways of approaching the world.

Bakar's 'Quest for a New Universal Science' is one of the ways in which he considers inter-civilizational dialogue is possible. He posits that all

human societies and civilizations have cultivated science and technology on a spiritual and moral foundation ... [and that in this regard] more often than not, men of religion and men of science were represented by the same individuals ... testifying to the unity of religion and science. (Bakar 1997a, 79)

Bakar bases his new universal science on the accomplishments of many civilizations, such as the ancient Egyptian contributions to anatomy, astronomy, and mathematics, and the work of the Pythagorean brotherhood in Greece, for whom

spirituality enlightens the path of science, conferring upon the latter meaning, direction and a higher sense of purpose, while science itself serves as a powerful intellectual

tool for interpreting and strengthening spirituality apart from its better known function of meaning and legitimate material and rational needs of man. (Bakar 1997a, 80)

The Pythagoreans developed the idea of a universe ruled by mathematics. Therefore, through the study of numbers, one can come to understand the harmony, equilibrium, and symmetry of the universe. The study of music is very important in this regard. The mathematical nature of the universe is said to have 'divine roots', and therefore the study of the universe is a spiritual endeavour (Bakar 1997a, 82).

For Bakar, the goal of education 'is to produce the intellectually and mentally, spiritually and emotionally, and ethically and morally sound human person' (Bakar 1997b, 107). Since differences in worldviews develop because of acculturation into different value systems, Bakar advocates a more universal approach that teaches not only the values of one's own society, but those of others as well (Bakar 1997b, 108). Therefore, rather than focusing on the sciences themselves, education should also develop critical thinking skills and an appreciation for both the natural and social world around us. Intellectual and rational skills should be developed by examining general principles and fostering 'the love for truth and knowledge, the possession of wisdom, intellectual honesty and objectivity' (Bakar 1997b, 110). All of these skills are necessary for the scientific endeavour, but are also important in daily life. Therefore, at the same time, students should be taught how to be deliberative and reflective, artistic and technologically minded, ethical and moral. With these skills in mind, students learn 'ingenuity, innovativeness, patience, power of concentration, capacity for precision, sense of proportions, economizing skills, and sensitivity to aesthetic considerations', namely how to be productive and happy human beings within healthy societies (Bakar 1997b, 117).

Looking at a specific example of inter-civilizational dialogue, Bakar also edited a book titled *Islam and Confucianism* (Bakar 1997c), to which he contributed an article, 'Confucius and the *Analects* in Light of Islam' (Bakar 1997e). Within the context of the twentieth-century religious revival, Bakar sees ample opportunity to explore the history, contributions, and potential of the Islamic and Chinese civilizations for both civilizational dialogue and cultural renaissance (Bakar 1997d, 3). These two civilizations have consistently intersected virtually since the beginning of Islam: Muslim minorities live in China and Chinese minorities live in Muslim countries, such as Malaysia. This is why, for Bakar, this civilizational dialogue is so important.

The papers published in this book were presented at a larger international seminar hosted by the University of Malaya in 1995, for the purpose of civilizational dialogue between Islam and Confucianism. The goals of this seminar, as well as Bakar's own position in relation to civilizational dialogue, are defined as follows:

- a. To foster greater mutual understanding among the major world civilizations in general and between Chinese and Islamic cultures and civilizations in particular;
- b. To contribute towards a better understanding of the nature and extent of past and present encounters and interactions between the two civilizations;
- c. To identify 'problem areas' in the contemporary encounter and interaction between Confucianism and Islam; and

- d. To suggest ways and means that can be pursued as part of an overall attempt to resolve these contemporary problems. (Bakar 1997d, 4)

Within this framework, Bakar is arguing for the complementariness and acceptability of Confucian ideals within Islamic philosophy. Bakar proposes achieving this goal through the discipline of comparative religion, in which specialists research into both traditions and then present their findings to the general public so that they can raise their concerns and develop their own conclusions (Bakar 1997e, 62). For example, he sees the works of 'Muslim Confucians' in history as foundational to this dialogue because they lived with both cultures simultaneously and saw no conflict between them. Scholars are necessary to make the works and conclusions of Muslim Confucians accessible to the general public in order to show the unicity of both traditions (Bakar 1997e, 63). After introducing Confucianism and its major tenets, Bakar concludes with a discussion 'Was Confucius a Prophet of Islam?'. It is believed within the Islamic tradition that *Allah* sent prophets to many cultures, and Bakar views Confucius potentially as one of these prophets, sent to the Chinese civilization, as he brought codified laws to the Chinese (Bakar 1997e, 72).

7. Conclusions

Bakar sees civilizational dialogue as imperative to the future understanding and cooperation between civilizations. Rather than accepting the products of the modernity of the West as they are, Bakar advocates a rediscovery or renaissance of pre-modern civilizations and epistemologies. One arena Bakar sees as fruitful in this regard is the activity of science, which although it may differ methodologically from culture to culture, is based on religious presuppositions, the most important of which, for Bakar, is the unity of the cosmos, and is an activity engaged in by every civilization. Therefore, Bakar advocates his *'ilm al-tawhīd* as one way in which cultures can come to learn about themselves, others, and the world around them through scientific activity. Indeed, this message is now being transmitted across civilizational boundaries: Bakar's work has been translated into Arabic, French, Indonesian, Spanish and Urdu. Oliver Leaman has suggested that 'the main advantage of ... Islamic science is that it is permissive with respect to methodology ... it broadens the concept of knowledge to allow a wide variety of different understandings of what knowledge is ... at the same time permits a variety of different kinds of science' (Leaman 1999, 56). It is precisely this variety which Bakar seeks to identify through inter-civilizational dialogue about the nature of the physical world and the relationship humanity has to that world. The scientific method is defined in different cultures in different ways, and it is in that difference that Bakar seeks to find his *'ilm al-tawhīd*.

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