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The debate over the compatibility of Islam and science still continues to invoke responses from basically two opposite camps: those who reject outright the prospect and feasibility of a compromise between religion and science, and those who see a compromise as not only reasonable but necessary if an equilibrium of values were to be kept in perspective. While identifying the basic points of tension between these two positions, this essay attempts to provide a survey and an analysis of basic Qur'anic evidence on relevant issues. An attempt is also made to present a round up of modern opinion in Muslim scholarly circles on the various aspects of the debate. The basic hypothesis maintained here is that the Qur'anic epistemology is inclusive not only of traditional knowledge but also of scientific knowledge.

### Introductory Remarks

The Islamic concept of knowledge encompasses transcendental knowledge as well as knowledge that is based on sense perception and observation. Islam also lays emphasis on beneficial knowledge that advances human welfare and seeks to utilize the resources of the universe for sound and beneficial purposes. The Qur'anic doctrine of vicegerency (khilafah) also places on Man, as a trustee and custodian of the earth, the responsibility to build the earth and utilize its resources with a sense of justice to oneself, one's fellow humans, the environment and other inhabitants of the earth. Scientific observation, experimental knowledge and rationality are the principal tools that can be employed in the proper fulfillment of this mission. Islam's perception of knowledge is thus value-oriented and informed by ethical and theological concerns. Many Muslim commentators have seen this as a basic pattern of harmony, rather than conflict, between Islam and science. But since the greatest achievements in science and technology at the present age are associated with Western civilization, the Islamic proposition of basic harmony is not the accepted framework in that context. The West's perception of religion and science does not recognize any link between the two and does not commit science to any structure of values outside its own perimeters. Western science has no place for religion and it sets the scene therefore for disharmony and discordance with it. Whereas Islam envisages a basic harmony with science, secularity and positivism, which are the principal attributes of Western science, dissociate science from religion. Due to global domination of Western technology and science, and its resolute alienation of religion, the claim is also made, and made increasingly louder, that Islam is no exception. Islam too is a part of the ancient world and the basic picture of conflict between science and religion therefore applies equally to Islam.

In almost all contemporary Muslim societies, there is on the one hand the urge to follow the Islamic tenets and live in accordance with its outlook and values, and on the other hand, the enormous pressure on individuals and societies to learn and adopt science and technology if they were to harness them to their advantage. This has created a dichotomy: they can neither wholeheartedly support the secular and materialistic outlook of science, nor the age-old notions of religion as many would see it to be out of touch with the demands of modernity and science.

It is the theme and purpose of this essay to test the accuracy of these claims, to ascertain the nature of the scientific method, and the extent of harmony and conflict between Islam and science. To do this, I propose to review some of the relevant passages of the Qur'an and then discuss the acceptability or otherwise of some of the tools of science, such as the inductive reason, to the epistemology of the Qur'an. I also address the claim that Islam did not propose an epistemology of its own and that Islam's outlook on reality and scientific knowledge has been shaped by Greek philosophy and thought. The last section of this essay looks into the pervasive impact of secularism on public education and certain other aspects of law and government in the Muslim world. I begin, however, with a brief characterisation of the principal themes of this inquiry, that is, religion and science.

### Religion and Science

Science is that branch of knowledge which deals with the material world, the world and natural phenomena that are observable, measurable and perceivable by the senses. Scientific knowledge is based on two important factors: observation and reflection. The former involves the use of the senses, and the latter is concerned with the exercise of theoretical reason, speculation and hypothesis. The interpretation of experimental data normally involves preconceived ideas and hypotheses of the investigator. Observed scientific reality therefore acquires much of its meaning and significance through what a theory or hypothesis may give it. The researcher may otherwise have difficulty to make sense of his observations. Experimentation alone, without theoretical reasoning, cannot therefore yield significant information about nature or the observed phenomenon. (1)

Positivism or the denial of reality to anything not perceived through the senses or not measurable by mathematics has become the tacit postulate of all that goes under the name of modern or western science. This attitude and outlook has pervaded all branches of science, including the humanities and social sciences. Every reality, whether natural or human, must be studied by one and the same method. It follows that all problems, including those of morality, society and politics can be addressed and resolved by the scientific method. (2)

The philosophy of science deals with philosophical issues that arise in connection with science. Questions such as how is our knowledge of the physical world obtained, and what are the postulates underlying scientific inquiry, the nature of causality etc., are addressed by the philosophy of science. The truth of an object in Greek philosophy, for example, lay not in the external manifestation of the object but in the inherent idea that the object manifested. This conception of truth reflected more on the essence rather than the material manifestation of truth. Such a view of the world was inclined toward mystical and allegorical meaning of reality and truth. Natural sciences, which studied matter, mortal and changing phenomena, could not therefore be a noble pursuit. (3)

Religion is concerned with the totality of existence both in this world and the next. Science concerns itself with this world alone and that too in a restricted sense. The exact sciences, as they are known, concern themselves with nature, whereas in social sciences both the natural and the social are combined. Religion is not as averse to science, one might say, as science is to religion. This is because religion does not reject scientific truth, whereas science does reject

the religious truth. Some Muslim and Christian commentators have even read religion and science as an extension of one another. Sayyid Ahmad Khan (d.1898) went on record to say that "the word of God as expounded in the Qur'an, cannot be contradictory to the work of God." As the words of God are unchanging, so are the works of God and the laws of nature. Science tries to discover these laws. "Religion and science" according to another observer are "close allies in the search for truth, and not adversaries." Both strive to advocate the ultimate reality and truth. However, while science relies on the inductive and experimental method, it only discovers partial truth regarding the observable universe. Religion uses an intuitive and direct approach to knowledge and aims at uncovering the whole truth, which includes both the visible and transcendental realities. Thus the facts uncovered by science can help us understand the truth revealed by religion, while religious insight can help supply "the missing pieces in the puzzles of scientific knowledge." (4) Einstein went on record to say that "science without religion is lame, and religion without science is blind." Max Planck similarly observed: "with religious people, God appears at the beginning of their thinking, with natural scientists, at the end." (5) Mutahhari (d.1979) has drawn attention to a certain shortcoming of science to address issues of concern to the human psyche: Half of human pains find no remedy except through science, but Man has other pains which relate to his human dimension. Here science provides no help, and when the scientists reach this point, they declare that science is neutral and indifferent; it is a means and it does not prescribe any goal for mankind. (6)

Religion and science are not in total harmony, but the tension that exists between them need not be exaggerated either. Human beings can remain spiritual and religious while enjoying the benefits of technology and science. The basic area of tension between religion and science is seen in the latter's materialist and experimental approach to reality that tends to preclude transcendental knowledge. The scientist does not speak, for example, of God and the creation of the first Man because he has no scientific data to refer to. The body of metaphysical discourse that draws attention to the existence of God, the creation of Man, and the intricacies of human psyche are not of primary concern to the scientist. The likely response of the scientist may be that he cannot go beyond what can be found and proved by evidence. This scientific attitude is very different from that of the ancient Greeks and early Muslim thinkers, who took an ontological view of knowledge which went beyond observable reality. Modern science aims not at ontological but at empirical knowledge. It denies the validity of the method of ontological science and believes in controlled observation, experimentation and generalisation. Scientific attitude and methodology cannot therefore be said to accept revelation as a source of knowledge. The spiritual aspect of man is ignored and man is regarded as a biological and social phenomenon. (7)

### **Greek and Islamic Epistemology**

Muhammad Iqbal (d.1938) advanced an incisive analysis of the Greek philosophy and its comparison with the worldview of the Qur'an. He refuted some of the hitherto common parallels that were drawn between the two. To begin with, Iqbal acknowledged that Greek philosophy had been "a great cultural force in the history of Islam." Yet while the Greek philosophy broadened the outlook of Muslim thinkers, it also obscured their vision of the Qur'an. It was due to Greek influence that the study of physics among Muslim philosophers and theologians was based on ratiocination and was usually not dependent on direct observation. Muslim

philosophers were also fascinated by Greek logic and metaphysics. The pervasive influence of Greek logic was incorporated, for example, in the science of the sources of law, the *usul al-fiqh*, and Greek metaphysics was assimilated into theology or *'ilm al-kalam*. Yet the worldview of Greek philosophy was in many ways very different to that of the Qur'an, but even so early Muslim thinkers were persuaded to uncritically embrace it, at the initial stages at least, and subsequent Muslim scholarship found it difficult to escape that influence. Iqbal highlighted the contrast between the two approaches when he noted that Socrates concentrated his attention on the human world alone. To him the proper study of man was man alone, not the world of plants, insects and stars. This is unlike the Qur'an which sees in the "humble bee a recipient of Divine inspiration" and constantly calls upon the reader to observe the perpetual changes of the wind, the alternation of day and night, the clouds and the planets swimming through infinite space.

Iqbal continued: for Socrates's disciple, Plato, sense perception yielded mere opinion and no real knowledge. This too is unlike the Qur'an which regards 'hearing' and 'sight' as the most valuable instruments of learning. Aristotle wrote extensively on physics without performing a single experiment, and on natural history without ascertaining the most easily verifiable facts. Earlier Muslim students read the Qur'an in the light of Greek thought. It took them 200 years to perceive, though not clearly, that the spirit of the Qur'an was essentially anti-classical. (8)

The Greeks essentially systematised, generalised and theorised while relying on logical deduction rather than on observation and experimentation. The patient method of investigation and scientific inquiry was altogether alien to Greek temperament. Yet the Muslim students of physics basically followed this and the broad outline of Aristotle's teachings on the subject. It is also clear, Iqbal added, that the birth of the method of observation and experiment in Islam was not due to a compromise with Greek thought but to a prolonged intellectual warfare with it. Abu Bakr al-Razi (d.935) was probably the first to criticise Aristotle's logic. Ibn Taymiyyah (d.1328) and Ibrahim al-Shatibi (d.1398) widened the scope of this enquiry and undertook a systematic refutation of Aristotelian logic. Islam's affirmative stance on rationality and science did gain recognition and was manifested in "the spectacular development of the natural sciences during the Abbasid period, and in Andalusia and Sicily. Advances in the field of the sciences were such that Islamic culture globalised for centuries, from the early Middle Ages to the Renaissance." (9)

Just as the Muslims were slow to absorb the Qur'anic epistemology on science, the Europeans were also slow to recognise the Islamic origin of their scientific method. Roger Bacon, who is credited with the introduction of experimental method, acquired his scientific training in the Muslim universities of Spain. Bacon acknowledged this and repeatedly emphasised the importance of Arabic and Arabic science to his contemporaries. Many Western commentators have also recognised that natural science and the scientific spirit represent the "most significant contribution of Islamic thought to European life and culture." (10)

Induction may be singled out as one of the basic tools of science. The inductive method in science is based on detailed observation of incidents and phenomena that eventually lead to the formation of a general conclusion. Nature in the sense of the observable world is the principal subject matter of science, but nature as spoken of in science includes, in addition to physical nature, society in all of its observable manifestations, human nature and human

behaviour. (11) The scientific method attempts to make the chaotic diversity of sense experience correspond to a logically uniform system of thought, which is provable, verifiable, and convincing.

Inductive reasoning is also the basis of the epistemological appeal of the Qur'an. In numerous places and a variety of contexts, the Qur'an calls on its readers to think, reflect and reason on the basis of what they experience and observe. They are encouraged to travel and explore the tracts of the earth, to study and observe the movement of the planets, the sun, and the moon, and reflect on the signs they see around them. Muhammad Iqbal went so far as to say in this connection that the Qur'an marked the birth of the "inductive intellect" and it is a religious obligation therefore of every Muslim to master the inductive method to uncover the laws of nature and society. (12)

In his article "The Islamic Worldview and Modern Science," Professor Nasr has envisaged, unlike Muhammad Iqbal, a direct clash of values between science and religion and denounced all attempts as "quaint" and "feeble" by modernized Muslims to read scientific subject matter in the Qur'an. This is because the very hypothesis of the existence of God is redundant in modern science. Then he poses the question "How can Islam accept any form of knowledge which is not rooted in God and does not necessarily lead to him?" (13) Nasr goes on to answer the question on the same page in favor of a total conflict and irreconcilable alienation between Islam and modern science. To quote Professor Nasr:

The adoption of western science can be carried out completely only by absorbing also its worldview in which case the consequences for the Islamic view of reality, both cosmic and metacosmic, cannot be anything but catastrophic. (14)

There seems to be an element of exaggeration in Professor Nasr's prognostication of "catastrophic consequences" for Islam in the acceptance of western science. In addition, a certain shift of focus in the argument is seen when Professor Nasr addresses a situation of complete and unquestioning reception of the worldview of the West. This is rather hypothetical: To the best of my knowledge hardly any Muslim commentator has proposed a complete and unexceptional acceptance of western scientific paradigms. The question often posed is over identification of certain lines of concordance or disagreement, and hardly, if ever, over attempting to establish complete harmony between the western scientific worldview and Islam.

Professor Nasr also tends to view knowledge and science as an extension of the dogma and belief of Islam and assumes that acceptance or rejection of the one must necessarily mean the same for the other. This is not quite in line with the purport of numerous ahadith of Prophet Muhammad advising his followers to seek knowledge from whichever source. Surely in such sayings, the Prophet could not have considered knowledge as an extension, nor even a concomitant, of the belief and 'aqidah of Islam. Far from it, such sayings take a pragmatic and utilitarian view of knowledge, which can be sought outside Islam if necessity or benefit demands such. The underlying assumption here is that a person's loyalty and commitment to Islam is unaffected by his or her attempt to seek knowledge from a non-Islamic source, nor is the knowledge so obtained of any lesser validity for that reason alone. Knowledge found in non-Islamic sources may not be "rooted in God" or necessarily lead to Him.

The Qur'an contains numerous references to knowledge that is obtained through the senses, and to man's responsibility for the proper application and channelling of his powers of observation, hearing, speech, and intuition. The text provides, for example: God brought you out of the wombs of your mothers when you knew nothing, and He gave you the hearing, and the sight, and the heart ... (Q. 16: 78). All knowledge is therefore acquired through the use of these faculties. In another verse, it is provided: And He gave you hearing and sight and feeling and understanding (Q. 32: 9). A science commentator noted concerning this verse that the special senses of hearing, seeing and feeling develop in this order. "The primordia of internal ears appear before the beginning of the eyes, and the brain (the site of understanding) differentiates last." (15)

Note also that references to the use of the senses in the Qur'an, especially to hearing and sight, are typically combined with a reference to intuition and understanding through the light of one's heart. This can be seen in the verses just quoted, and in another verse which reads: verily the hearing and the sight and the heart will each be asked ... (Q. 17: 36; 67: 23). Another passage refers to those who deny the signs of God in the world around them even when their experience would tell them otherwise: ... but their ears and eyes and heart availed them not since they denied the signs of God (Q. 46: 26; 3: 179). Also of interest here is that the reference to hearing in these passages consistently precede the reference to seeing, a point which has prompted one observer to note that hearing is more widely used in the acquisition of knowledge. As of the moment of birth of a child, unlike the eyes which open gradually, the hearing is immediately functional. Similarly, when a person falls asleep, the eyes close but hearing continues to be receptive to sound. It is further noted in this connection that hearing (al-sam') is the principal means of transmitted knowledge, whether by means of revelation (wahy) or through narration of past events. If one hears one's teacher's voice without seeing him, one can follow him, but it would be difficult to achieve the same if one could only see but not hear one's teacher. (16) In another place the Qur'an praises those who listen to the word and follow the best of it (or make the best possible interpretation thereof) (Q. 39: 18). This clearly subjects the data of sense perception to the exercise of intellectual selection .

Knowledge is gained through observation and experimentation backed by reflection, as in the following verses: Say: Travel in the earth and see how He made the first creation (Q. 29: 20). Have they not travelled in the land so that they should have hearts with which to understand? (Q. 22: 46). The first part of these verses refers to observation, and the second part to the use of reason, reflection and understanding. Experimental work is thus an indispensable tool for the understanding of nature. The text also teaches that there are realities in the physical world that we do not perceive through our senses: But nay! I swear by that which you see and that which you do not see (Q. 69: 38).

The Qur'an is virtually replete with reminders that in this or that there is a lesson or message for those who hear, for those who see, for those who think (yasma'un, yubsirun, yatafakkarun, ya'qilun) about the world, about the Qur'an, their own selves and their Creator.

This inductive experimental and reflective method of the Qur'an can also be seen in its phenomenology, that is, the occasions of its revelation (asbab al-nuzul) in that a great deal of the Qur'an was revealed in conjunction with actual events that were experienced by the early

Muslims, and the Companions often asked the Prophet questions about them. The asbab al-nuzul is a much wider phenomenon but explicit references to it can be found in at least fifteen Qur'anic verses which begin with the phrase "they ask you (yas'alunaka)" about such and such, and then the text addresses the issue as the case may be. Furthermore, it is always the truth that must prevail, as the Qur'an provides. And say: the truth has come and falsehood has vanished away; verily falsehood is bound to vanish (Q. 17: 81). And The word of thy Lord finds fulfillment in truth and justice. There shall be no alteration to His words (Q. 6: 115).

The notion of beneficial knowledge (al-'ilm al-nafi') in Islam, which features prominently in the sayings and teachings of the Prophet Muhammad, contemplates the end-result of knowledge and advocates utilitarian knowledge that contributes to human welfare, in preference to that which may have doubtful consequences. This would clearly discourage promotion of science and technology that inflicts prejudice and harm. Production of weapons of mass destruction and environmental degradation and damage would be clear cases at point; legalisation of human cloning may prove to present a similar case.

Islamic thought in the Middle Ages did not admit of the ontological distinction between tangible entities and entities of a spiritual or subliminal nature. This is certainly a more sound and realistic view of reality than is allowed for by modern positivist doctrines of science. Being is manifested at various levels and in several forms, none of which is less real than the other. Arabic thought employed the notions systematised in Stoic theory that divided being into three locations: verbal utterance, psychic representation, and reality - without the latter in any sense having exclusive title to Being. Al-Farabi (d.950) took up this view, and assimilated psychic representation to the entities of reason. Others rehearsed this division with the addition of a fourth location, that of Scripture. Existence thus had a four-fold manifestation depending on whether the thing existed immediately in itself, or whether its like was graven in the mind (dhihn, psyche), whether composed of sounds, which indicated psychic representation, or was it manifested in characters standing for sound and speech. All four have a basic characteristic in common, which is existence. (17) While some thinkers and scientists confined their typology of existence (wujud, haqiqah) to the two genera of the mental and the immediate, this did not render the verbal and the spiritual existentially suspect. They were all part of a theory of knowledge in which the immediate and literal were identified as basic and original existence, while existence in the psyche formed part of the field of figurative existence.

In all cases the truth, whether articulated in speech or represented in the psyche, was believed to consist of correspondence between a tangible immediate existent, a verbal existent, and a graphic existent. The ideal state of knowledge therefore was one which seized the very immediacy of the object of knowledge in which the correspondence between concept and thing was complete. It is a state in which the object is so assimilated by its concept, or the concept to its object, that they are interchangeable. Knowledge thus relates to its object in that the object is apprehended visually or quasi-visually. The latter refers not only to gnosis but also to idealised knowledge in general, as is indicated by the use of the term cilm, and not ma'rifah, the latter being used to indicate mystical gnosis as opposed to articulated knowledge, which is science. (18)

### **Faith and Reason: A Qur'anic Perspective**

The basic harmony of faith and reason is also manifested in the Qur'an through a series of exclusions which seek to clarify the correct from the misleading means and avenues of knowledge. These are manifested in at least four contexts, which may be summarised as follows: (19)

### **(a) Rejection of conjecture (al-zann) vis-a-vis certitude (al-yaqin):**

This is a basic guideline that the Qur'an advocates not only in religious disputation but also in the context of learning, testimony and adjudication, and indeed in most other areas of human relations. Although certainty remains the ideal standard of knowledge, conjecture that inclines toward probability is nevertheless accepted as a basis of judgment in practical human affairs (mu'amalat), such as in court decisions that are often based on zann, for want of certainty, in order to facilitate resolution of disputes among people.

The Qur'an precludes conjecture and probability as a basis of belief, as faith must be based in conviction, which precludes zann. To this effect the text takes its deniers to task, for their blind faith in what is no more than conjecture: ... they follow not aught but conjecture, and surely conjecture avails nothing against the truth (Q. 53: 28). Conjecture in this verse, as in many other verses of the Qur'an (cf., Q. 10: 36; 6:116), is used in contradistinction to knowledge ('ilm, yaqin), and it is 'ilm acquired through hearing, seeing and reason that command acceptance. This is what the believers are instructed in another verse to ...follow not that of which you have no knowledge ('ilm). Surely the hearing and the sight and the heart are all accountable. (Q. 17: 36).

### **(b) Rejection of passion and untrammelled desire (hawa'):**

Qur'anic references to hawa' occur in contradistinction to correct guidance and truth. Thus it is provided in an address to the Prophet-King David: O David! We made you a vicegerent in the earth so that you judge among people with truth, and follow not the passion that sways you away from the path of God (Q. 38: 26).

Confusion that can be caused by passion, whether consisting of love, hatred or anger etc., can be so powerful as to obfuscate rational judgment. The basic message of this verse is that the best qualified of judges, even prophets, are not immune to the influence of hawa'. Equally clear is also the point that knowledge and truth must be pursued and vindicated through reasonable methods that are not influenced by personal sentiment and passion. The extensive influence of hawa' is elsewhere indicated in the Qur'an, which provided in an address to Prophet Muhammad: Have you seen (the predicament of) one who chooses for his god his own passion? Would you then be a guardian over him? (Q. 25: 43).

Passion can dominate a person's outlook totally in which case truth and reason can have but little place in his order of priorities. The Prophet Muhammad has been repeatedly warned as to the little or no impact his teachings could make on such persons. This evidence sustains the conclusion that rationality is a means to knowledge, discovery of truth, and justice only when it is not tainted by the vagaries of hawa'.

### **(c) Rejection of blind imitation:**

Islam's outlook on reason is also based on its intrinsic merit that is inspired by nothing less than conviction, as opposed to blind imitation of the custom and legacy of the past. The objectivity of reason is to be ensured by its independence from conventional practice which does not necessarily provide correct knowledge and guidance. The past must be judged in the light of reason and rejected if it is found misleading. To this effect, the Qur'an has recounted the attitude of its deniers and the typical response they have given to the Prophet Muhammad: Nay, we follow the way of our ancestors- even if their ancestors did not know nor were they rightly guided (Q. 5:104; also 2:170). This was also the response that Prophet Abraham and many other prophets received from idol-worshipers but the text retorted it in such terms: both you and your ancestors were clearly misguided (Q. 21:52; 7:70; 11:87). These references to past events and prophets are made with a view to underline a certain continuity of values, and in this instance, also to confirm that knowledge and truth stand on their own merit independently of custom and convention of the past.

### **(d) Rejection of oppressive dictatorship:**

The Qur'an takes to task those who indiscriminately obey arrogant dictators who are themselves averse to enlightenment and truth. Thus it is provided that the plea of those who say on the Day of Judgment: O our Lord! Surely we obeyed our princes and great men, but they misled us (Q. 33: 66) will have no merit. This is because, as the text explains, they rejected the correct guidance when it was conveyed to them. In another verse, the text refers to the Pharaoh who misled his people: We sent Moses with our signs and clear evidence unto Pharaoh and his chiefs, but they followed Pharaoh's command which failed to give the right guidance (Q. 11: 96). In another verse it is stated that the Pharaoh persuaded his people to make light (of Moses), and they obeyed him. They were none other but a wanton folk (Q. 43: 54).

People are thus advised to use their own judgment and distinguish between guidance and misguidance in the light of reason. This is because they themselves, and not their self-styled leaders, would ultimately be held responsible. The intrinsic value of truth and knowledge must therefore remain unaffected by the indulgent claims of oppressive men who often seek to subjugate others for their own selfish interests.

Muhammad 'Abduh (d.1905) held that there is no necessary conflict between religion and science. Both are founded in reason, and both study natural phenomena, albeit from different angles. Since the Qur'an encourages the Muslims to study and investigate the universe, Islam should be considered as a friend, not the enemy, of science. cAbduh also observed that there was nothing against true Islam in modern civilisation and science, provided that Islam was rightly understood and rightly expressed.

In saying this 'Abduh emphasized those Islamic tenets and principles which are fundamental to Islam and are not meant to be of local and temporary application. (20)

### **The Impact of Secularism**

It seems that the affirmative stance of Islam on scientific inquiry and method created a basic attitude of receptivity to modern/western influences in the spheres of education, the legal profession and the judiciary. Notwithstanding the many questions that were asked as to whether western secular methods should be accepted in Islam's traditional center's of learning, that resistance has gradually diminished and significant changes have been made to educational curricula and methods in Islamic schools and universities. Reforms of this kind continued to be undertaken even decades after the end of colonial rule in some Muslim countries.

Public education in Muslim countries, including scientific education, was brought by colonial powers who replaced the Islamic educational system that prevailed earlier, or else the new methods were superimposed on an under-layer of the traditional system that still remained operative. The western approach to education basically precluded religion from the purview of science and led to inevitable conflict with it. The product of that combination was duality and bifurcation between the old and the new, a colonial legacy which persists to this day in the educational system of many Muslim countries. It has proved difficult to blend the two systems into an integrated whole, despite the fact that policy makers in Muslim countries have often tried to achieve that.

The Western scientific approach to liberal education can be seen in the 1946 Harvard Committee Report entitled *General Education in a Free Society*, which divides knowledge into three categories: natural sciences, humanities, and social studies. General education is expected to develop certain capabilities of the mind which are "to think effectively, to communicate thought, to make relevant judgments [and] to discriminate among values." (21)

Effective thinking is described as having three phases: logical, rational and imaginative. Logical thinking is applicable to practical matters such as whom to vote for and whom to befriend; it is also the ability to extract universal truths from particular cases and infer the particular from the general. It is manifested in the ability to analyse a problem and recombine its relevant elements with the help of imagination.

By rational thinking, the Report means the ability to think at a level appropriate to a problem. The Report adds that making relevant value judgment involves the ability of the student to bear a whole range of ideas upon the area of experience. "Discrimination among values" means the ability to distinguish various kinds of values, aesthetic, moral and intellectual and then to commit oneself to such values in the conduct of life.

(22) The Report excludes metaphysical knowledge and religious studies from the sphere of knowledge, and confines the attention of educationists to a concept of man for whom belief in God, or even pursuit of knowledge beyond the domain of the senses does not have any special significance. One commentator noted that by ignoring religious studies the Report failed to appreciate the effect of religion on personality and the direction that effective thinking might take as a result of the impact of religion on the whole person. (23)

The view that Islam subordinates science to the teaching of religion finds support in Professor Seyyed Hossein Nasr who wrote that by contrast to the Western world which views the science of nature to be mainly concerned with "quantitative aspects of things," and science is closely

identified with technology and its applications, Islamic science "seeks perfection and deliverance." To understand it requires placing oneself within its perspective as a "science of nature which has a different end, and uses different means from those of modern science." The ultimate aim of Islamic science, Nasr added, has always been to relate the corporeal world to its basic spiritual principle which seeks to unite the various orders of reality. (24) "The arts and sciences in Islam are based on the idea of unity" and its aim is to show the inter relatedness of all that exists. In contemplating the unity of the cosmos, man may be led to the unity of the Divine principle, of which the unity of Nature is the image. (25) Professor Nasr's views have been met with some reservation, as one of his critics noted: "For me the true worth of science lies in helping us to understand nature ... We need science and technology not to make us more spiritual, moral and ethical...[but] to make us more productive" and enable us to subdue and manipulate nature. (26) I also have some reservation over the statement that Islamic science has different ends and uses different means compared to modern science. For I started the basic theme of this essay with a hypothesis that the inductive method, being the principal means and tool of modern science, is equally accepted in the Islamic theory of knowledge, be it the arts, the natural sciences or medicine. Soroush is of the view that modern science explains the world as if it was not created by a god, not denying his existence, but rather finding no need to postulate it. It is thus assumed that even if there were a god, science would nonetheless be able to explain the world without relying on his existence. Soroush has thus acknowledged a degree of disharmony between religion and science but added that the tension which exists between them need not be exaggerated. (27) University Press, MA, pp. 39-40.

Secularism is widely regarded as one of the tools, and also a major contribution, of modern science, which stands at odds with spirituality and religion. Yet it is interesting to note that secularism has penetrated public education in the Muslim world especially during the colonial rule and ever since. Secularism is defined as the deliverance of Man "first from religious and then from metaphysical control over his reason and language." Secularism and modernisation both subscribe to a fundamental belief in rationality and scientific thought: Just as Nature is separated from the will of God, Man is 'freed' from the restrictive demands of religion. (28) It would be difficult to claim that Islamic thought can accept secularism as such without some reservations. Yet certain aspects of secularism have been adopted in the Arab world and brought about considerable transformation in its institutions of learning, the judiciary and the status of religious scholars and ulama. It is also manifested elsewhere in the replacement largely of *fuyaha* by lawyers, and of religious teachers by trained teachers in modern schools, especially when the *kuttab/maktab*, the Qur'anic schools, were transformed into modern schools on the Western model, even though the process was gradual and uneven. One of the reservations that may be noted here is as follows: Muslims have adopted many of the premises of secularism without, however, isolating religion from public life. This may be said to be manifested in many of the formal constitutions of Muslim countries which recognise Islam either as the state religion or accord other forms of recognition to its validity and acceptance.

The changes that took place in public education and Islamic institutions of learning were on a wider scale in other parts of the Middle East compared to Egypt, where for various reasons, al-Azhar kept its control over primary education. In the Maghreb, French colonialism divided the education system into a modern sector closely modelled on the French system and another, older sector, based on the *kuttab*. The transformation was extended with the replacement of the

madaris, which used to teach the fiqh, the Qur'an, the hadith and elements of Arabic, by universities applying modern curricula. Drastically revised curricula were later, and somewhat reluctantly, introduced by institutions like al-Azhar, and Zaytuna, perhaps less drastically in the former. But Zaytuna was transformed so much that reduced its status from a university to what is now a part of a modern university, known as the Faculty of Religious Studies. Changes in al-Azhar were not so radical as the new faculties, and their revised curricula still remained under the umbrella of the old al-Azhar principles and traditions.

Turkey under Kamal Ataturk had imported western secular education without even attempting to reform the traditional system. Indonesia, and Malaysia, although Muslim majority countries, almost uncritically accepted secularism or else remained non-committal to the idea of a reformed Islamic educational system beyond retaining religious education as a subject in the curricula of their national schools. Both countries have in the meantime retained their traditional madrassas, some of which have been expanded, and to some extent reformed, in recent decades. (29)

These changes led to a shift from a perception which saw public affairs, society and education through the prism of religion, to one that bore the imprint of modernity, or nahdah (awakening), that implied openness to further modernisation. Changes were often accompanied by social upheavals that took place in Arab and Muslim societies far over a century that affected their education system and the judiciary more than most. The body of ulama was displaced from the leading places it had occupied in public life. The introduction of legal codes in many fields that were previously governed by the fiqh texts added to the marginalised status of the ulama. Formal constitutions introduced on the eve of colonialism in many Muslim and Arab countries were yet other instrument of secularism which articulated the ideas and foundations of the Western nation state in these countries. (30)

### **Conclusion**

The Islamic theory of knowledge is entrenched in the affirmation of both the physical and the metaphysical aspects of reality and truth. Belief in the Oneness of Being, or tawhid, is an article of the Islamic faith and a cornerstone of its epistemology. Yet for Muslims this only adds a dimension to their view of modern science. To identify the religious and scientific truths as of the same provenance tends to overcome the notion of an inherent conflict between religion and science. Science for the believers of Islam cannot, in other words, be pitted against belief in an Omnipotent God. There may be instances of tension between Islam and science, as our discussion has indicated, yet it does not seem to provide a rationally compelling argument for a Muslim to reject God and religion in order to be able to accept science. To see religion and science both as acceptable facets of one's worldview does not necessarily amount to a logical contradiction- from an Islamic viewpoint at least. To accept the metaphysical dimension of reality is an integral aspect of the Islamic worldview, and the Qur'an clearly demands that. In a similar vein, to acknowledge the reality of the human psyche and thought is just as natural as acknowledging his physical existence. This is bound to be ultimately a wholesome and a more meaningful approach to the understanding of reality and a sound foundation, therefore, of a valid epistemology.

It is important, of course, to have a philosophical framework through which to give meaning to the data of sense perception and a sense of coherence to one's understanding of reality, science, and religion. Yet philosophical differences apart, science is often seen for its material advantages and benefits. With the ever-accelerating pace of science and technology in addressing issues of human welfare and need, the utilitarian view of science is increasingly making its presence felt among Muslims and, one would assume, among the humanity at large. This may also be seen as an aspect of science that has the potential of bringing the people together and act as a factor of unity among them, despite their differential philosophical persuasions. Muslims and non-Muslims can surely work together for the advancement of scientific knowledge that is of benefit to humanity, just as they have done so in the past. If the practical utility of technology and science becomes even more evident and compelling, one would not be surprised then to see Muslims embracing more openly the views of Muhammad Abduh, Sayyid Ahmad Khan, and Muhammad Iqbal, who saw a basic harmony between Islam and science as an integral part of the epistemology of the Qur'an.

- (1.) Saud, Muhammad (1986), *Islam and Evolution of Science*, Islamic Research Institute, Islamabad, p.3; Golshani, Mehdi (1989), "Philosophy of Science from the Qur'anic Perspective" in *Toward Islamisation of Disciplines*, International Institute of Islamic Thought, Herndon, Va, p.75.
- (2.) Garudy, Roger (1989), "The Balance Sheet of Western Philosophy in This Century" in *Toward Islamisation*, n.1, pp.400-1.
- (3.) Ashraf, Ali (1985), *New Horizons in Muslim Education*, Islamic Academy, Cambridge, p.27.
- (4.) Afzaal, Ahmad (n.d), "Qur'an and Human Evolution" p.2 of the online article, [www.fortunecity.com/brozers/cheshire/170/survival%20\(1\).html](http://www.fortunecity.com/brozers/cheshire/170/survival%20(1).html); also see, Ashraf (1985), n. 3, p. 27.
- (5.) Both quoted in Hofmann, Murad Wilfred (2002), "Has Islam Missed its Enlightenment?" in *The American Journal of Islamic Social Sciences*, vol. 19, p.9.
- (6.) Mutahhari, Murtada "History and Human Evolution" trans. by Alauddin Pazargadi, [www.al-islam.org/al-tawhid/2human/evol.htm](http://www.al-islam.org/al-tawhid/2human/evol.htm), p.3.
- (7.) Ashraf (1985), n.3, pp. 7-8.
- (8.) Iqbal, Muhammad (1982), *The Reconstruction of Religious Thought in Islam*, Muhammad Ashraf, Lahore, pp.3-4. See also Saud (1986), n. 1, p.13.
- (9.) Hofmann (2002), n. 4. p. 4.
- (10.) Roger Garudy (1989), n. 2, p. 400.
- (11.) Ali, Ausaf (1996), *Islam, Science and Islamic Social Ethics*, Occasional Paper 24, Islamic Research Institute, International Islamic University, Islamabad, n.26, p.18; Soroush, Abdolkarim

(2000), Reason, Freedom and Democracy in Islam, tr. and ed. by Mahmud Sadri and Ahmad Sadri, Oxford University Press, New York, p. 50.

(12.) Iqbal, (1982), n. 8, chapter 5.

(13.) The article appears in Selected Papers on Science in Islam published by Pakistan Association for History and Philosophy of Science, Islamabad, 1998, p.51.

(14.) Ibid., p.52.

(15.) Moore, Keith "A Scientist's Interpretation of References to Embryology in the Qur'an", [www.quran.org.uk/ieb-quran-embriologylogy.htm](http://www.quran.org.uk/ieb-quran-embriologylogy.htm).p.1.

(16.) al-Qaradawi, Yusuf (1416/1996), al-'aql wa'l-Ilm fi'l-Qur'an al-Karim, Maktaba Wahba, Cairo, p. 234.

(17.) Al-Azmeh, Aziz (1976), Arabic Thought and Islamic Societies, Routledge Kegan & Paul, London, p. 109.

(18.) Ibid., pp. 109-12.

(19.) Qaradawi (1996), n.13 pp. 250-70.

(20.) Quoted in Siddiqi, Mazharuddin (1982), Modern Reformist Thought in the Muslim World, Islamic Research Institute, Islamabad, pp. 92-3.

(21.) Harvard Committee, General Education, p. 64, quoted in Ashraf, New Horizons, n.3, and pp. 36-37. Physics, chemistry and biology are natural sciences whereas economics, political science and sociology are social sciences, and anthropology, psychology and psychoanalysis are classified as human sciences.

(22.) Ashraf (1985), n. 3, p. 37.

(23.) Ashraf (1985), n.3, p. 38.

(24.) Nasr, Seyyed Hossein (1968), Science and Civilization in Islam, Harvard

(25.) Ibid., p. 22.

(26.) Ali (1996), p. 26.

(27.) Soroush (2000), n.12, p. 122, 161.

(28.) Ashraf (1985), n.3 p. 8-9.

(29.) Al-Azmeh (1996), Islams and Modernities, 2nd edn., Verso Books, London and New York,

p. 47; Ashraf (1985), n. 3, pp. 52-3.

30. Ibid., p. 48.

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