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CHAPTER 1

Religious Consciousness and the Scientific Spirit in Islamic Tradition

As an integral religious tradition encompassing all aspects of human life, Islam deals not only with what man must and must not do, but also with what he needs to know. In other words, Islam is both a way of acting and doing things and a way of knowing. Of the two ways, the aspect of knowing is the more important. This is because Islam is essentially a religion of knowledge. Islam looks upon knowledge as the central means to salvation of the soul and to the attainment of human happiness and prosperity in this life as well as in the hereafter.

The first part of the testimony of faith in Islam, *Lā ilāha illa' Llāh* ("There is no god but God"), is a statement of knowledge concerning Reality. Muslims look upon the various sciences, natural, social, and others as so many different bodies of evidences which point to the truth of this most fundamental statement in Islam. This statement is what is popularly known in Islam as the principle of *tawḥīd* or Divine Unity.

Tawḥīd: The Source of Scientific Spirit

Muslim religious consciousness is essentially the consciousness of the Unity of God. The scientific spirit is not opposed to this religious consciousness, since it is an integral part of the latter. To possess a consciousness of Divine Unity is to affirm the truth that God is One in His Essence, in His Attributes and Qualities, and in His Works. One important consequence of affirming this central truth is that one has to accept the objective reality of cosmic unity. As a source of knowledge, religion is emphatic in maintaining that all things in the universe are interrelated in a web of cosmic unity through the cosmic laws governing them. The cosmos is made up of many levels of reality, not just the physical. But it constitutes a unity because it must manifest the oneness of its metaphysical source and origin religiously called God. In fact, the Quran strongly argues that cosmic unity is a clear proof of Divine Unity.[1]

The scientific spirit of Muslim scientists and scholars flows, in fact, from their consciousness of *tawḥīd*. There is no doubt that, religiously and historically speaking, the origin and development of the scientific spirit in Islam differs from that in the West. Nothing better illustrates the religious origin of the scientific spirit in Islam than the fact that this spirit was first demonstrated in the religious sciences.

Muslims did not begin to cultivate the natural sciences in earnest until the third century of the Islamic era (the ninth century of the common era). But when they did so they were already in possession of a scientific attitude and a scientific frame of mind, which they had inherited from the religious sciences. The passion for truth and objectivity, the general respect for fully corroborated empirical evidence, and a mind skilled in the classification of things were some of the most outstanding features of early Muslim religious scholarship as can clearly be seen

1. "If there were, in the heavens and the earth, other gods besides God, there would have been confusion in both!" *The Quran*, Chapter XXI (The Prophets), Verse 22.

in their studies of jurisprudence and the prophetic traditions.

A love for definitions and conceptual or semantic analysis with great emphasis on logical clarity and precision was also very much evident in Muslim legal thought as well as in the sciences related to the study of various aspects of the Quran such as in the science of Quranic commentaries *('ilm al-tafsīr)*. In Islam, logic was never conceived as being opposed to religious faith. Even the grammarians, who initially opposed the introduction of Aristotelian logic *(manṭiq)* by philosophers like al-Fārābī,[2] did so on the belief that their Stoic-like juridical-theological logic, known as *ādāb al-jadal* (art of argumentation), was already sufficient to meet their logical needs.

Among Muslim philosophers and scientists, logic was always viewed as an indispensable tool of scientific thinking. They also considered logic a form of *hikmah* (wisdom), a form of knowledge which is extolled by the Quran. In their use of logic, they were as much concerned with clarity and consistency as with truth and certitude. They were too aware of the fact that logic is a double-edged instrument which can serve both truth and error.

Logic was developed by Muslim philosophers and scientists within the framework of a religious consciousness of the Transcendent. In their view, logic, when used correctly and by an intellect that is not corrupted by the lower passions, may lead one to the Transcendent itself.[3] An obvious function of logic in relation to religious truths is to help explain their rationality and clarify their overall consistency in the face of outward appearances of incoherence and contradiction.

Some philosopher-scientists, such as al-Fārābī, wrote works which sought to demonstrate that Aristotelian logic found strong

2. See M. Mahdi, "Language and Logic in Classical Islam," in G.E. von Grunebaum, ed., *Logic in Classical Islamic Culture* (Wiesbaden, 1970), pp. 51-83; see also Osman Bakar, *Al-Fārābī: Life, Works and Significance* (Kuala Lumpur: The Islamic Academy of Science, 1987), p. 18.
3. For a profound discussion of this role of logic in relation to the Transcendent, see F. Schuon, *Logic and Transcendence* (London: Perennial Books Ltd., 1975).

scriptural support in the Quran and the prophetic *ḥadīths*. When a religious scholar of the stature of al-Ghazzālī wrote a work with a similar purpose, and with full conviction embraced Aristotelian logic in its entirety, the last significant traces of opposition to that logic from the religious quarters disappeared. *Manṭiq* in its Islamic home became an important tool not only of the philosophical sciences but also of the religious sciences.

It is indeed significant that *al-burhān*, the term used in Muslim logic to denote the scientific method of demonstration or demonstrative proof, is derived from one of the names of the Quran.[4] According to al-Ghazzālī, the Quranic term *al-mīzān*, usually translated as the balance, refers among other things to logic. Logic is the balance with which man weighs ideas and opinions to arrive at the correct measurement or judgment.

The Spirit of Experimentation in Islamic Science

The extensive use of logic in Islam did not lead to the kind of rationalism and logicism one finds in the modern West precisely because the use of reason was never cut off from faith in divine revelation. Muslim scholars were imbued with a strong religious awareness of the Transcendent. They generally affirmed the idea of the superiority of divine revelation to human reason. Similarly, the importance attached to logical thinking did not stifle the spirit of experimentation among Muslim scientists.

Long before Roger Bacon introduced and popularized the experimental method into European science, empirical studies of nature, namely studies based on observation and experimentation, were already widespread in the Muslim world. Such kind of studies were certainly carried out by Muslims on a far more extensive scale than had ever been attempted in all the previous civilizations. Many contemporary historians of Islamic science were struck by what they call the characteristically modern spirit of Muslim empirical approach to the study of nature.

Famous Muslim scientists like al-Rāzī, Ibn Sīnā, al-Bīrūnī,

4. See *The Quran*, Chapter IV (Women), Verse 174.

Ibn al-Haytham, al-Zahrāwī, Nasīr al-Dīn al-Ṭūsī, Quṭb al-Dīn al-Shīrāzī, and Kamāl al-Dīn al-Fārsī, just to mention a few, were all noted for their observational powers and experimental tendencies as displayed in their wide ranging studies of the natural sciences, including medicine. Many works have been written on the achievements of these scientists in the experimental domain. Therefore, it is not necessary to repeat them here.[5] The primary consideration here is not to discuss Muslim achievement in experimentation in itself but in relation to their religious and spiritual consciousness.

Just as the extensive use of logic did not lead to secular rationalism which rebels against God and religion, so also the widespread practice of experimentation did not lead to an empiricism which regards sensual experience as the source of all knowledge. The traditional Islamic epistemology (theory of knowledge) provides all the necessary safeguards against such kinds of philosophical deviations. Islam is the religion of unity *(tawḥīd)* and equilibrium *(i'tidāl)*. As such, it upholds the idea of the hierarchy and unity of knowledge and of modes of knowing. All possible avenues to knowledge are duly recognized, and each accorded a legitimate place and function within the total epistemological scheme of Islam.

Logical thinking, mathematical analysis, observation, experimentation, and even rational interpretation of sacred Books all have their legitimate roles to play in the scientific enterprise of early Muslim scientists. As long as Muslims were faithful to the true spirit of *tawḥīd*, implying a faithfulness to the idea of the hierarchy and unity of knowledge, they were spared of that unfortunate and intellectually precarious situation whereby one mode of knowing is affirmed at the expense of other modes, or the validity of some modes of knowing negated in the name of upholding the supremacy of some other modes.

In accordance with the principle of *tawḥīd*, Muslims affirm

5. See, for example, S. H. Nasr, *Islamic Science: An Illustrated Study* (London: World of Islam Festival Publishing Company Ltd., 1976); also his *Science and Civilization in Islam* (Kuala Lumpur: Dewan Pustaka Fajar, 1984).

that God alone is the Absolute and that everything else is relative. As the Absolute Truth *(al-Ḥaqq)*, God is the source of all other truths which, however, admit of a hierarchy or degrees of relativity. These levels of relative truths are known to man through a variety of ways. According to Islam, man has been equipped with all the necessary faculties of knowing which enable him to know all that he needs to know. Says the Quran:

> He (God) Who has made everything which He has created most good: He began the creation of man with (nothing more than) clay. And made his progeny from a quintessence of the nature of a fluid despised. But he fashioned him in due proportion, and breathed into him something of His Spirit. And He gave you (the faculties of) hearing and sight and feeling (and understanding): Little thanks do ye give![6]

Muslims are therefore reminded by the Quran that all the faculties of knowing, which man possesses – his five physical senses, his internal senses such as the faculties of memory and imagination, and his rational and spiritual faculties, namely the intellect and the heart – are God's precious gifts to him for which he must always be thankful. To be thankful to God is not merely to acknowledge the divine origin of all these faculties of knowing, but also to use each of them in a legitimate way that is proper to its nature and function. The legitimate use of each faculty demands that its proper domain of competence and its limitation be duly recognized. As clearly emphasized in the Quranic verse just cited, the different components of man have been fashioned by God "in due proportion." For this reason, there is quite a voluminous literature on this subject written by Muslim scholars over the centuries. Muslim philosopher-scientists treated this subject under the discipline of faculty psychology to which they contributed many original ideas and theories.[7]

6. *The Quran*, Chapter XXXII (Adoration), Verses 7-9.
7. See F. Rahman, *Avicenna's Psychology* (Westport, Connecticut: Hyperio Press, Inc., 1981 reprt.).

The importance of sensual experience as a source of empirical knowledge of the world was very much emphasized by Muslims. But they also emphasized the fact that the physical senses, as instruments of knowledge, have their limitations. Here comes the intervention of religious consciousness. The Muslim belief-system dictates that there are phenomena and realities which are beyond the ken of the physical senses even with the aid of the most powerful and sophisticated of telescopic and microscopic instruments.These non-physical phenomena and realities demand the use of appropriate non-physical faculties of knowing. Physical reality is only an aspect of the whole of reality. It is regarded by Muslims as the lowest of the many levels of reality, the highest being God.

Even at the level of physical reality, a Muslim's religious consciousness influences his intellectual attitude toward that reality and his scientific study of it. A Muslim knows that the physical world does not have an independent existence of its own. The physical world, like all other worlds, owes its existence to God. It is always linked to God. The moment it is cut off from God it ceases to exist. Deism is something alien to Islamic thought. Muslims had never entertained the idea of the universe as a clock and of God as the clockmaker who, having created the clock to its completion and perfection, left it to function on its own.

The spirit of Muslim observation and experimentation is shaped by this religious consciousness. It was not religious doubt and scepticism which inspired the success stories of Muslim experimental science. The spirit of Muslim experimentation was inspired rather by the certainty of God as the Absolute and as the source of all truths.

Muslims carry out observations and experimentations with the firm conviction that they are seeking to know an aspect of the reality of God. According to the twelfth-century Muslim philosopher, Suhrawardī, the world is none other than God's knowledge of the world. To know the world, therefore, means to know God's knowledge of the world. The Muslim conviction that

whatever truths or knowledge they were to discover about nature could not be opposed to the teachings of their sacred Book comes from that book itself. The Quran exhorts believers to observe the signs of God manifested in the natural world, within the souls of men, and in the pages of human history and society.[8] It also calls upon them to verify all claims to truth and knowledge to ensure that justice prevails and that doubt gives way to certitude. Scientific experimentation is only one of the many forms of this verification process.

The Religious Significance of the Quest for Objectivity

Despite the claim made by many people today that modern science is the most objective knowledge of the natural world ever attained in the history of human civilizations, the truth of the matter is that modern science is no more objective than, say, Islamic science which is its most immediate predecessor. The quest for objectivity is not unique to modern civilization. In the Islamic perspective, the quest for objectivity in intellectual pursuits not only is legitimate and desirable, rooted as it were in man's inner nature, but also possesses a profound religious significance.

Objectivity is an essential element of the scientific spirit. Without objectivity, knowledge as a collective human enterprise would not be possible. The primary meaning of objectivity is related to two principal ideas. One is the idea of impartiality and a "disinterested" perspective as opposed to bias, prejudice and an "interested" point of view. The other idea, which is related to the first, refers to the principle of collective or public verification. Objective knowledge is that knowledge which is open to public

8. "We shall show them Our signs on the horizon and within themselves until it will be manifest unto them that it is the Truth". *The Quran*, Chapter XLI (Abbreviated Letters), Verse 53.

In another place, the Quran says: "Have they not journeyed through the land and beheld the end of those before them who were more numerous than they and mightier in strength, and who left a greater mark upon the earth? Yet all that of which they possessed themselves availed them not." Chapter XL (The Believer), Verse 82.

verification. Not surprisingly, in the modern world, empirical knowledge is deemed the only objective form of knowledge, since it is this type of knowledge which is accessible to and verifiable by most people. The Islamic point of view, however, as I will explain shortly, is quite different. A piece of knowledge is not considered any more objective than another simply because it is verifiable by a greater number of people than is possible in the latter case.

Impartiality, disinterestedness and justice in knowledge, as in other domains of human life, are noble human qualities and as such they are universally esteemed. These qualities serve as ideals for all men to emulate whatever the difficulties may be when it comes to their actual realization. Islamic scholarship has been very much concerned with the cultivation and acquisition of these qualities. Islamic civilization can take pride on the fact that, compared to many other civilizations, it has been quite successful in manifesting these qualities in the different domains of knowledge.

In the Islamic tradition, the sense of objectivity, understood as referring to the qualities of impartiality, disinterestedness, and justice in the domain of knowledge, is inseparable from the religious consciousness of *tawḥīd*. The situation in the modern world is different. Religion is regarded by many people today as the greatest impediment to the realization of impartiality and justice. To its many critics, religion breeds bias, prejudice and sectarian points of view. In other words, to many modern minds, religion would be the last thing that can deliver objectivity in scholarship. But secular, modern scholarship has yet to show that by discarding religion from its worldview, it can attain a higher standard of impartiality, universality, and justice than had been demonstrated in religiously based scholarship, especially traditional Islamic scholarship.

In the discipline of comparative religion, for example, the degree of scientific objectivity attained by medieval Muslim scholarship, as demonstrated, for example, in al-Bīrūnī's tenth-

century study of the Indian religion,[9] is yet to be surpassed. Referring to the scientific nature of medieval Muslim works on natural science, Bernal, a contemporary Marxist historian of science, noted with some surprise how little difference there is between reading these medieval works and their modern counterparts.

According to Islam, man desires and needs objectivity because, being created in the image of God, he seeks to emulate the divine qualities. To be objective is, in a sense, to emulate God. Man is capable of objectivity because, in principle, he has been endowed with the qualities associated with this objectivity. Impartiality, disinterestedness, and justice are not just human qualities. Rather, they are divine qualities which are also manifested in man. Religion, more particularly its spiritual dimension, provides the doctrines and the practical means whereby these qualities can be made to blossom in the human individual. Therefore, there is an important conceptual relationship between scientific objectivity and religious consciousness. Objectivity in scholarship is not merely of scientific but also of religious significance in the sense that it presents itself to us as one of the many outward manifestations of man's unique position in relation to God, even if many people today have forgotten this truth.

Objectivity in modern scholarship is mainly confined to the empirical or experimental domain. Islamic intellectual tradition, however, speaks of objectivity on the higher planes of human consciousness as well. This position maintained by Islam is a logical outcome of its belief that there are many levels of objective truth. Physical, mathematical, and metaphysical truths are all objective in nature. Corresponding to each level of objective truth, there is a particular form of verification or proof involving the particular faculty of knowing through which that objective truth is cognized. Objectivity is also possible in the domain of non-empirical knowledge, such as in religious and spiritual

9. See al-Bīrūnī, *Alberuni's India*, trans., E. C. Sachau (London: Kegan Paul, Trench, Trubner & Co., Ltd., 1910).

knowledge or in philosophical and metaphysical knowledge, precisely because all men, in principle, possess the higher faculties of knowledge: Islam maintains that objectivity in its highest sense belongs to the intellectual order. This objectivity refers to the intellectual power of discernment which enables man to distinguish between the Absolute and the relative or between God and what is other than God.

Conclusion

In Islam, religious consciousness of *tawḥīd* is the source of the scientific spirit in all domains of knowledge. Consequently, Islamic intellectual tradition does not entertain the idea of the natural sciences alone as being scientific or as being more scientific than the other sciences. Similarly, the idea of objectivity which is so essential to the scientific enterprise is inseparable from religious consciousness and spirituality.

CHAPTER 2

The Question of Methodology in Islamic Science

In any attempt to revive the Islamic scientific tradition in the contemporary world, or to create a science of the natural world that is at once new and traditional[1], one of the central questions that call for our special attention and that need to be thoroughly treated and resolved is the question of *methodology*. Why is this question of central importance to us? It is because, in reality, there are fundamental differences between the conception of methodology of science in Islam, or for that matter in every other traditional civilization, such as the Chinese or Indian civilization, and the conception of methodology in modern science.

In our customary way of thinking, however, we have been entertaining ourselves to a very different idea altogether. For so long we have succumbed to the notion that modern science has been created by means of a single methodology only, the famous

1. Traditional science is that science which, while being organized and orderly knowledge of an objective order, is also of a religious character since it is based upon the application of the Divine Principle to the domain of study in question. On the meaning and significance of the traditional sciences in the contemporary world, see Nasr, "The Role of the Traditional Sciences in the Encounter of Religion and Science – An Oriental Perspective," *The Wiegand Lecture* delivered at the University of Toronto in October 1983, and published under the same title in *Religious Studies*, 20 (1984), 519-541.

so-called *Scientific Method*[2]. The idea of only one type of science of nature being possible, through the use of the *Scientific Method*, greatly influenced our whole way of looking at the pre-modern sciences, including Islamic science. The degree of application of the *Scientific Method* became the universal yardstick of the scholarly community in determining the degree of scientific creativity and 'purity' of pre-modern minds.

With very few exceptions[3], the usual Muslim response to the above modern assertion about scientific methodology has been to seek to demonstrate that Islamic civilization preceded the modern West in the application of the *Scientific Method*, and that it exerted a great influence upon the latter civilization in the domain of scientific thought. That the *Scientific Method* was widely practiced in Islamic science is now a well-established fact in the pages of the history of science, as we have already mentioned in the previous chapter. But we also know that this is by no means the only method employed by Muslim scientists even in their creation of that element of Islamic science, which best corresponds to the current meaning of the term 'science'.

One of the most important findings established by Professor Nasr's pioneering works on Islamic science, viewed as an independent scientific and intellectual tradition, is that there is no single method which is used in that science to the exclusion of other methods. On the contrary, Islamic science has always

2. A Nobel prize winner for Medicine writes, "Unfortunately, we in England have been brought up to believe that scientific discovery turns upon the use of a method analogous to and of the same logical stature as deduction, namely the method of *Induction* – a logically mechanised process of thought which, starting from simple declarations of fact arising out of the evidence of the senses, can lead us with certainty to the truth of general laws. This would be an intellectually disabling belief if anyone actually believed it . . .". See P. Medawar, *Pluto's Republic* (Oxford University Press, 1982), p. 33.
3. On this exceptional response, which seeks to present Islamic science as having a methodology of its own, see the various works of Professor Seyyed Hossein Nasr on Islamic science. In particular, see *Science and Civilization in Islam*; *An Introduction to Islamic Cosmological Doctrines* (Cambridge, MA: Harvard University Press, 1964) and (London: Thames & Hudson, 1978); *Islamic Science*, "Reflections on Methodology in the Islamic Sciences" in *Hamdard Islamicus*, 3:3 (1980), 3-13.

sought to apply different methods in accordance with the nature of the subject in question and modes of understanding that subject. Muslim scientists, in their cultivation and development of the various sciences, have relied upon every avenue of knowledge open to man, from ratiocination and interpretation of sacred Scriptures to observation and experimentation.

Even in modern science itself, the idea of a single methodology alone as being responsible for its creation has been demolished by numerous works on methodology of science, which have appeared over the last decade or so. Instead, the idea of a pluralistic methodology has now gained wide currency among contemporary historians and philosophers of science. Some of them have gone to the extent of even accepting sacred Scriptures as an integral component of this pluralistic methodology[4]. Similarly, a number of professional scientists, mostly physicists, from R. Oppenheimer and E. Schrödinger to Fritjof Capra, have turned to Oriental doctrines in the hope of finding solutions to certain dilemmas and problems encountered at the frontier of modern physics[5].

Viewed as a whole, it can be said that one of the most interesting and significant developments to have taken place in modern science is the realization that the creative process which has produced that science is far more complex than what has been popularized as the *Scientific Method*. But does this new awareness and acceptance of a pluralistic methodology in the creative process of modern science now mean that the fundamental differences between the Islamic conception of methodology of science and the modern one have disappeared? To this question, we say in the affirmative that fundamental differences remain.

Where do the differences lie? The methodology of science in Islam is based on an epistemology that is fundamentally different

4. See P. Feyerabend, *Against Method*, verso Edition (1982), p. 30.
5. See E. Schrödinger, *My View of the World* (Cambridge, 1964); Fritjof Capra, *The Tao of Physics* (Boulder: Shambhala, 1975) and *The Turning Point: Science, Society and the Rising Culture* (Bantam edition, 1983), Chap. 9.

from the dominant epistemology of modern science, which so far has remained largely unaffected by this new intellectual development, although an increasing number of scientists, historians and philosophers of science have spoken of the need for a new epistemological paradigm that can provide a coherent view of the world revealed by modern science[6]. It is true to say that, as an empirical way of knowing things, the *scientific method* of modern science is hardly distinguishable from the *scientific method* of Islamic science. Philosophically speaking, however, it is not looked at in the same way in the two sciences in relation to their respective epistemologies. Similarly, the problem of the creative process is viewed differently in the two sciences. It can be said that it is one thing to admit the reality of a pluralistic methodology and to entertain its desirability; it is another to possess a unified vision of that pluralistic methodology.

It is because of the lack of a unified vision in contemporary philosophy of science that all the positive intellectual gains that can possibly accrue from the new realization of what the creative process in modern science is, or is not, appear to have been lost in all sorts of philosophical interpretations. In one such interpretation, a pluralistic methodology is construed as a kind of theoretical anarchism which nevertheless possesses a value of its own within the epistemological scheme and in the advancement of scientific progress[7]. Others deny altogether the possibility of us

6. For example, see Morris Berman, *The Reenchantment of the World* (Cornell University Press, 1981); Kurt Hubner, *Critique of Scientific Reason* (The University of Chicago Press, 1983). For those works which argue strongly for an epistemological paradigm that is rooted in the traditional worldview, see Huston Smith, *Beyond the Post-Modern mind* (New York: Crossroad, 1982) and an updated and revised edn. (Wheaton, Ill.: The Theosophical Publishing House, 1989); also his *Forgotten Truth: The Primordial Tradition* (Harper & Row, 1976); F.F. Schumacher, *A Guide for The Perplexed* (Harper & Row, 1977); Nasr, *Man and Nature: The Spiritual Crisis of Modern Man* (Kuala Lumpur: Foundation for Traditional Studies, 1989).

7. P. Feyerabend, *op. cit.* The whole book, as it itself says, is an anarchistic theory of knowledge. Its introduction summarizes the book's contents as follows: "Science is an essentially anarchistic enterprise: theoretical anarchism is more humanitarian and more likely to encourage progress than its law-and-order alternatives".

ever knowing the true nature and reality of man's intellectual creativity while at the same time acknowledging its special position in scientific methodology[8].

Also, the pluralistic methodology currently accepted by certain segments of the scientific community does not encompass the totality of methodologies of Islamic science. Modern science cannot at one and the same time retain its present epistemological foundation, and adopt revealed sacred Scriptures and intellectual intuition, as this term is traditionally understood, as part and parcel of its methodology, without falling into philosophical contradictions. How can it do so when its very epistemology was itself the product of a conscious rebellion against, and rejection of the idea of revelation and all that it implies. In truth, the acceptance of one necessarily implies the rejection of the other.

If certain contemporary philosophers of science speak of incorporating sacred Scriptures into the modern methodology of science, they do not mean to accord them the same epistemological status as given by the traditional sciences. Were modern science to do just precisely that, it would cease to be modern science as it is presently understood and cultivated. It would imply a spiritual transformation or rebirth of modern man[9]. This only goes to show that, in the traditional view, the question of methodology is conceptually inseparable from the ultimate purpose of human cognition, which has to do with the question of the spiritual destiny of man.

In the case of epistemological paradigm of Islamic science, based as it is upon the idea of Unity *(Tawḥīd)*, it does possess a unified and coherent vision of what the multiplicity of methodologies means. These methodologies, in fact, issue forth ultimately from the Quranic view of Reality and of man's place in that Reality. More generally, Professor Nasr has clearly shown that an organic relation exists between Islam and the Islamic sciences.

8. For a discussion on this topic, see, for example, P. Medawar, *op. cit.*, Chap. entitled *Introduction and Intuition in Scientific Thought.*

9. For a profound treatment of this theme, see Nasr, *Man and Nature.*

Specifically, this organic relation can clearly be seen in that aspect of Islamic science, which pertains to its methodology.

It is the aim of this chapter to discuss the principles underlying this relationship. In the light of these principles, it then becomes transparent why in Islamic science all of these different methods are considered as valid ways and means of knowing Nature within their respective domains of applicability. These methods are not contradictory, but rather complementary means of realizing the final goal of the Islamic sciences, namely, the Unicity of Nature, which is itself derived from the twin source of *Revelation and Intellectual intuition*[10]. Consequently, the different sciences based on these different methods of knowing are also seen to be in complete harmony with each other, and not as conflicting disciplines with rival claims to truth. If this organic relation between Islam and the methodology of Islamic science is always born in mind, then we may assert that no science developed by present-day Muslims can claim itself as being totally Islamic in form and character so long as the methodology employed remains embedded in the epistemological paradigm of modern science, even though all the different methods and techniques of study and research that are associated with that methodology are also accepted as important elements of the methodology of Islamic science.

In this discussion of the principles of methodology in Islamic science, we have drawn much of the material from Professor Nasr's numerous published works on various facets of Islamic science, which we strongly believe could provide the necessary point of departure for all current attempts by Muslim scientists at creating once again that science in the contemporary world. Admittedly, on the question of methodology alone, for example, there is so much that remains to be studied of Islamic science.

10. The Unicity of Nature, which is the goal as well as the basis of the Islamic sciences, is derived from the application of the principle of *al-Tawḥīd* (Unity) contained in the first Shahadah, *Lā ilāha illa'Llāh*, to the domain of Nature. It is understood to mean the interrelatedness of all things that exist. See Nasr, *Islamic Cosmological Doctrines*, pp. 4-5.

Such a study would of course be of great help to today's scientists to understand better the dynamics of the creative process that has produced Islamic science in the past. Still, what has been written so far on the subject has more than just provided a preparatory ground work for further research. It has also enabled us to have the first clear glimpse of traditional Muslim scientific minds at work and of the inner reality underlying their intellectual creativity, which is so central to our understanding of the conception of methodology in Islamic science.

Principles of Methodology in Islamic Science

To speak of methodology is to speak of ways or methods by means of which man can gain knowledge of Reality, either in its partial or total aspects. Therefore to speak of methodology is first of all to speak of man who is the subjective pole of knowledge, that is to say, the subject that knows. This pole consists of all the faculties and powers of knowing within man, which are hierarchic in nature. In other words, man is capable of having multiple levels of consciousness. Next, to speak of methodology is to speak of the Universe, which is the objective pole of knowledge, that is to say, the object that is knowable, and which is also hierarchical. In other words, the Universe has multiple levels of being or existence. Islamic methodology of knowledge *(al-'ilm)* deals precisely with the essential relationship between this hierarchy of man's faculties of knowing and the hierarchy of the Universe, and with principles governing that relationship.

From Islamic intellectual history, we inherit a vast amount of literature dealing with the question of methodology of knowledge. All the different intellectual schools in Islam, such as those of *kalām*, the *mashshā'ī* (Peripatetic), the *ishrāqī* (Illuminationist) and the *al-ḥikmat al-muta'āliyah* (transcendent theosophy) schools of Islamic philosophy, as well as those of *ma'rifah* (gnosis), which are mainly identified with the Sufis, have touched upon the same subject matter, but from different perspectives, and with different points of emphasis and ends in view, as well as with varying

degrees of intellectual profundity, sophistication and rigor[11]. The terminologies employed and the detailed picture conceptualized of the dynamics of man's acts of knowing may vary from one school to the other, but all of them are categorical and united in their view in asserting the hierarchic nature of both man's faculties of knowledge and the Universe. In this chapter, we will make occasional references to the views of some of these intellectual schools on the specific points under discussion.

It is now the assertion of many present-day historians and philosophers of science that the set of phenomena chosen to be studied by a particular scientific collectivity is actually determined by a particular view of reality, which has been accepted *a priori* by that collectivity[12]. In the case of modern science, the reality with which it is solely concerned is the Cartesian reality that has become reduced to mind and matter, viewed as two totally distinct and separate substances[13], which for the mainstream of that science, and for modern western philosophy in general, became an accepted fact. In the case of Islamic science, the whole cosmos with which it is concerned displays a far great-

11. On these various intellectual schools, see Nasr, *Islamic Life and Thought* (Albany: SUNY Press, 1981); Majid Fakhry, *A History of Islamic Philosophy* (New York: Columbia University Press, 1983). As for the views of these schools on the question of the methodology of knowledge, see Nasr, "Intellect and Intuition: Their Relationship from the Islamic Perspective" in S. Azzam (ed.), *Islam and Contemporary Society* (Islamic Council of Europe, 1982), pp. 36-46.
12. See T. S. Kuhn, *The Structure of Scientific Revolutions* (University of Chicago Press, 1970); Michael Polanyi, "The Growth of Science in Society" in *Knowing and Being* (1969), pp. 73-86. K. Hubner writes in his *Critique of Scientific Reason*, "Factual assertions and fundamental principles are entirely to the contrary, merely parts of theories: they are given within the framework of a theory; they are chosen and valid within this framework; and subsequently they are dependent upon it. This holds for all empirical sciences – for the natural sciences as well as those pertaining to history", p. 106.
13. This Cartesian dualism is now being challenged by a number of physicists. See, for example, D. Bohm, *Wholeness and the Implicate Order* (Routledge & Kegan Paul, 1980), in which he develops a theory of quantum physics that treats the whole of existence, including matter and consciousness as an unbroken whole.

er qualitative richness of reality than the modern or
the latter's pride in claiming itself as being an infinite

The anatomy of this Islamic cosmos, in its multi
and states, is based on the data furnished by the Islan
tion itself. It is therefore the Islamic Revelation which c
whole domain of study to which the Islamic sciences
directed. The Muslim mind which accepts such a v
cosmos has, prior to that, already accepted Revelation as the highest source of knowledge. The Muslims' conception of Revelation has important consequences for the methodology of science in Islam, as we shall see later.

The traditional cosmos, that is to say, the whole of God's created order consists of three fundamental states: the *material or corporeal* state; the *psychic* or *animistic* state; and, the *spiritual* or *angelic* state. In Sufi terminology, these three states are respectively called *nāsūt*, *malakūt* and *jabarūt*[14]. The material world, also called the *gross* world, is immediately enclosed and dominated by the psychic domain, also referred to as the subtle world. These two worlds together form the domain of 'nature'. And it is the angelic world which governs all natural laws in both the subtle and gross domains (See Fig. 1).

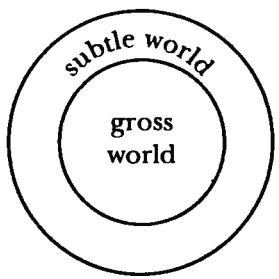


Fig. 1
The World of Nature

14. See F. Schuon, *Dimensions of Islam* (London: Allen & Unwin, 1970), p. 144.

The Sufis, basing their idea on the data provided by the Quran, formulated the doctrine of the "five Divine Presences" *(al-ḥaḍarāt al-ilāhiyyat al-khams)* to depict the hierarchy of the whole of Reality[15] (see Fig. 2). The above three states – the material, subtle and spiritual – in that order, are also the first three "Presences" in ascending order. The next higher level of reality or "Presence" in this hierarchy is the realm of the Divine Qualities *(asmā' ṣifātiyyah)*, that is to say, the Qualities of God, for example, those Qualities which refer to Him as Creator and Revealer. This fourth state, designated as *lāhūt*, is thus identifiable with the Creative Principle or Being. It is the ontological principle of the whole cosmos, and is therefore the Absolute with respect to the whole of creation. The next and the highest "Presence" is the Divine Essence *(al-dhāt)*. This "degree", termed *hāhūt*, is the infinite and Supreme Self, Beyond-Being which is the "non-qualified" and "non-determined" Principle, and is therefore the Pure Absolute[16].

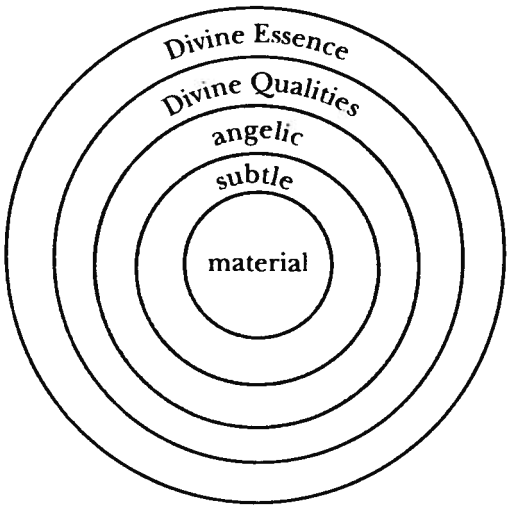


Fig. 2
Hierarchy of Reality

15. On the Quranic premises of the doctrine, see *ibid*, pp. 146-147.
16. *Hāhūt* is from *huwa* meaning He; thus, it may be translated as Quiddity or Ipseity. See *ibid*, p. 144.

The structure of Reality that is outlined above has been dealt with by Muslim philosophers, theologians and especially the Sufis. It is a generally accepted structure, although, in its detailed divisions and in the terminologies used, there are indeed differences not only between these distinct intellectual schools but even within the same school, as for instance among the Sufis. With these differences we are not concerned here. In the context of our present discussion the point which we wish to emphasize, however, is the fact that the above Islamic vision of Reality was very much present and operative in the minds of Muslim men of science, like Ibn Sīnā, al-Bīrūnī, Ikhwān al-Ṣafā', and so many others, in the course of their cultivating and developing the various sciences.

The cosmic reality thus envisaged, which represents the objective pole of Islamic epistemology, is always viewed in relation to its ontological principle, namely, the Divine Intellect or Pure Being. In fact, as asserted by Ibn Sīnā, *true science* is that science which seeks the knowledge of the essences of things in relation to their Divine Origin[17]. This is the knowledge of noumena, that which relates phenomena to their true Origin which is the source of all existence. Therefore it is only in the light of an awareness of such an hierarchy of Reality that true science is possible.

How is the essential relationship between the heirarchy of the subjective pole and that of the objective pole of knowledge envisaged? The relationship envisaged is one that involves the idea of a one-to-one correspondence between the two poles. Every level of cosmic existence has its corresponding existence in man. There is nothing in the macrocosm that does not derive from the metacosm, meaning the Divine Principle, and which is

17. Ibn Sīnā discusses true science or the real purpose of studying Nature in his *Ishārāt wa'l-tanbīhāt*. His conception of true science is aptly expressed by a contemporary author, F. Brunner, "La science véritable suspend la connaissance du monde a la connaissance de Dieu pour le monde dans son intégrale réalité et pour constituer l'expression légitime, au niveau du monde, de l'intellection transcendante qui est la fin de l'homme". See his *Science et réalité* (Paris, 1954), p. 13.

not to be found again in the microcosm[18]. Corresponding to the tripartite structure of the corporeal, the subtle, and the spiritual worlds of the traditional cosmos is the tripartite structure of body *(corpus)*, soul *(anima, psyche)*, and spirit *(spiritus)* of the traditional human microcosm (see Fig. 3). In Islamic terminology, these essential constituents of the microcosm are respectively called *jism*, *nafs* and *'aql*[19].

Viewed from the perspective of knowledge or consciousness *(shuhūd)*, *'aql* refers to the human intellect which is man's highest faculty of knowledge, and which may be identified with the eye of the heart *('ayn al-qalb)* for, in the language of the Holy Quran and prophetic ḥadīths, the heart means essentially the seat of knowledge, or the instrument for the attainment of knowledge. A knowledge of what the intellect is and does, that is to say, a knowledge of its nature, powers and functions, is the key to the understanding of the problem of the creative process, of the creation of ideas, concepts, and theories in man's scientific enterprise. Accordingly, we will deal with this important topic, albeit briefly.

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 macrocosmic Universe, and the source of the sacred Book, the Quran, which is the basis of religion[20]. As generally maintained by Muslims, the uncreated reality of the Holy Quran resides in the Divine Intellect. The fact that the individual human intellect, the macrocosmic Universe, and the Holy Quran all have the same metaphysical basis or source possesses an immediate significance for the methodology of

18. F. Schuon, *Esoterism as Principle and as Way* (Middlesex: Perennial Books, 1981), pp. 17-18.
19. Another possible set of Islamic terminology is *jism*, *khayal* and *rūḥ*.
20. According to many *ḥadīths*, God 'wrote' by the Pen *(qalam)* the inner reality of all things on the Guarded Tablet *(al-lawḥ al-mahfūz)* before the creation of the world. The Pen symbolizes the Universal Intellect, the Logos or the Word, "by which all things are made'. It is also by the Pen that God 'wrote' the eternal Quran upon the Tablet. Thus, metaphysically, the Quran contains the prototype of all creation.

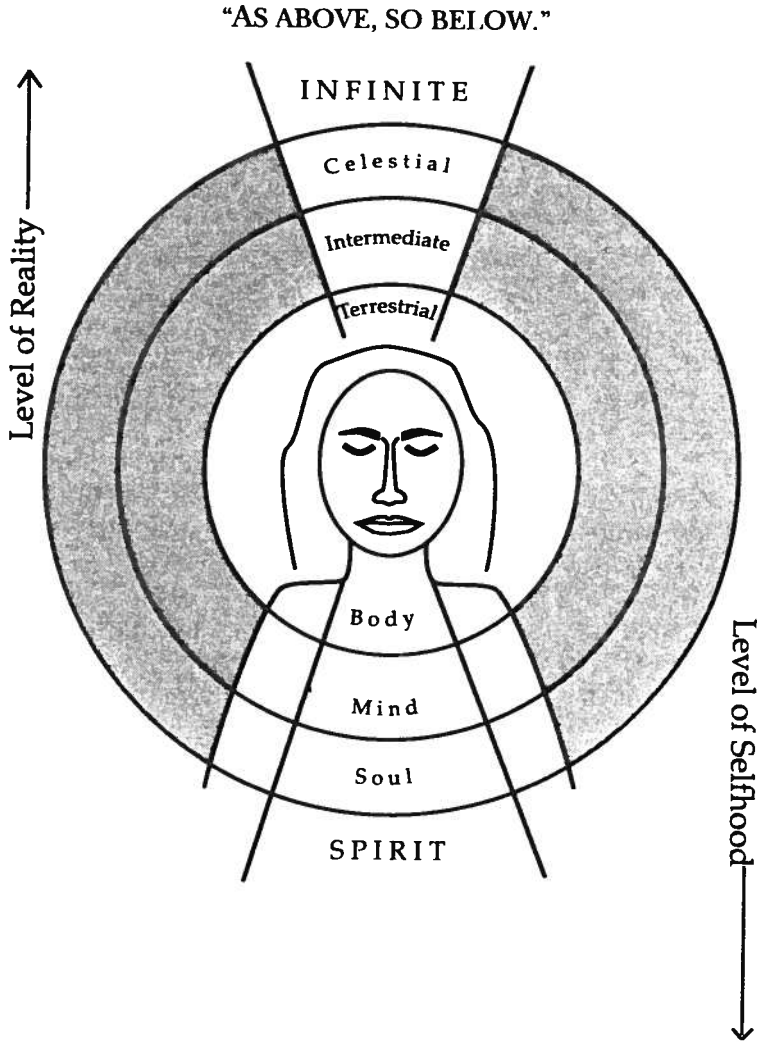


Fig. 3 Macrocosm and microcosm in one-to-one correspondence (this figure is reproduced from Huston Smith's *Forgotten Truth*).

science in Islam. In contrast to the motive that leads certain contemporary philosophers of science to consider sacred Scriptures as a possible source of scientific reference, there are profound metaphysical and intellectual reasons for the adoption of sacred Books by Muslim scientists and philosophers as an .egral part of their overall methodology. In the latter case, it is question of being in conformity with the nature of Reality as .ch.

The human intellect, the macrocosmic Universe, and the evealed Quran constitute three fundamental elements or as-ects in the comprehensive idea of revelation in Islam. They are ll integrally related to the central thesis in Islam, namely, that, by His nature, God creates and reveals[21]. According to one sacred ḥadīth *(ḥadīth qudsī)*, God desires to be known, so He creates the Universe. This implies that God's Creation is also His revelation, for otherwise it would not be possible for Him to be known through His Creation. The central being in this created Universe is man who, by virtue of the supernatural character of his intellect and its cognitive powers, and by virtue of being a universe in miniature[22], is in a position to know the Universe completely as well as to know its uncreated Principle. Thus the human intellect has often been referred to as the subjective, partial or particular revelation of God *(al-waḥy al-juz'ī)*.

By way of contrast, the Holy Quran, which is the basis of Islam, is referred to as God's objective and universal revelation *(al-waḥy al-kullī)*. Similarly, the created Universe is described as a cosmic revelation and a book of God, whose uncreated reality has been called *al-Qur'ān al-takwīnī* (meaning the Quran of creation). It is again the principle of *tawḥīd* which integrates these three forms

21. See Schuon, *Understanding Islam* (London: Allen & Unwin,1972), p. 13.
22. Man possesses within himself the complex faculties of the various souls: the mineral soul *(al-rūḥ al-'aqdiyyah)*, the vegetative soul *(al-nafs al-nabātiyyah)*, the animal soul *(al-nafs al-ḥayawāniyyah)*, and the rational soul *(al-nafs al-nāṭiqah)*. Through a complete knowledge, essentially speaking, of himself as the microcosm, he therefore knows the Universe the macrocosm. See Ibn Sīnā's treatment of this theme in Nasr, *Islamic Cosmological Doctrines*, Chap. 14.

of divine revelation into a total unity that is at once comprehensive and coherent.

How can the human intellect know completely the whole of the created order as well as know the uncreated Self? This knowledge is made possible through the actualization of all the possibilities latent within the intellect. But this actualization itself is possible only if the intellect, the subjective revelation in man, were to submit itself to the sacred Book, the objective revelation. Ibn Sīnā, for example, says that every human being possesses intelligence in a latent form, called material or potential intelligence *(bi'l-quwwah)*[23]. The process of actualizing all the possibilities of the intellect passes through several stages which represent different degrees of intellectual attainment.

The first stage is the attainment of habitual intelligence *(bi'l-malakah)*. A person acquires this intelligence when the first intelligible forms are present in his or her soul. The second stage is reached after full actualization of the intelligibles has taken place in the mind, and the corresponding intellect is called the actual intellect *(bi'l-fi'l)*. The third stage is the complete realization of this actual intellect, and this state of the intellect is called acquired intelligence *(mustafād)*. Then there is that supra-individual intellect which transcends this highest level of human intellect, and which renders this whole process of intellectual actualization possible. It is called by Ibn Sīnā the Active Intellect *(al-'aql al-fa"āl)*. The illumination, at various levels, of man's rational soul *(al-nafs al-nāṭiqah)* by the Active Intellect enables the various faculties and powers of knowing of the soul to be fully functional and receptive to "ideas" coming from the intelligible and spiritual worlds.

This doctrine concerning the intellect, expounded in detail by the school of philosopher-scientists in Islam, of which Ibn Sīnā is generally considered the greatest representative, but which we have presented here only in its main outlines, has important implications for all those who are genuinely concerned with the

23. See Nasr, "Intellect and Intuition," p. 39.

cultivation of the scientific mind, as this term is understood in its most universal sense. The problem of the creative process in scientific enterprise has been posed and debated rather extensively in contemporary philosophy of science. We have alluded earlier to this point at some stage of our discussion.

Questions have been asked whether creativity, that is to say, the question of the origin of ideas, concepts, and theories, is analyzable and reducible to any well-defined, step-by-step method, and whether creativity is something that is cultivable or not. Professor Nasr has posed the first question for Islamic science. He asks[24]: By what method did Muslim scientists arrive at their original ideas, concepts, and theories which were later tested against facts or the rigor of logical analysis? How did Ibn Sīnā arrive at his impetus theory, or Naṣīr al-Dīn al-Ṭūsī at his new model for planetary motion, or Ibn al-Haytham at the concept of momentum, one of the most fundamental concepts of modern physics, or Shihāb al-Dīn al-Suhrawardī at his theory of corporeal objects as being degrees of light? Professor Nasr affirms the view that such creativity, whether in the case of Muslim scientists or their modern counterparts, cannot be reduced to any well-defined, step-by-step method, but always involves an intuition, a jump of a creative nature.

Even though the above view is now widely shared by many modern scientists, the fact remains that the perspective in which the question of creativity or intuition is viewed in Islamic thought differs profoundly from that in which modern science seeks to understand the problem. The modern search for solutions to the problem of "origins", whether of ideas or otherwise, has remained a horizontal search bound to the terrestrial domain, for the perspective adopted is one that ignores or denies higher orders of reality beyond the world of matter and mind. The problem of the origin of ideas is sought to be resolved mostly at the level of the physics and chemistry of the human brain or consciousness. In such a perspective, the divine origin of man's creative ideas is denied, and in its place modern man invents

24. Nasr, "Reflections on Methodology . . .", p.8.

and popularizes the idea of human genius, a concept which is of minor importance to traditional civilizations.

Similarly, to the problem of how creativity or the intuitive dimension of man's thought processes may possibly be stimulated and enhanced, in true conformity to this secular and materialistic spirit of viewing the reality of human consciousness, the prescriptions sought are confined to those of the purely physical and psychological order. Sir Peter Medawar, British Nobel Prize winner for Medicine in 1960, provides a representative sample of this prevailing view of the problem when he says:

> That 'creativity' is beyond analysis is a romantic illusion we must now outgrow. It cannot be learned perhaps, but it can be encouraged and abetted. We can put ourselves in the way of having ideas, by reading and discussion and by acquiring the habit of reflection, guided by the familiar principle that we are not likely to find answers to questions not yet formulated in the mind. I am not offended by the idea that drugs may help us to formulate hypotheses, but I know of none which improves their quality ,and I should hesitate to use a drug which did not enhance the critical faculty in proportion to the rate of accession of ideas[25].

From the traditional point of view, the realm of creative or intuitive ideas to which modern scientific mind seeks to be receptive, as the above view so well illustrates, is not the same world of intellectual intuition as understood in Islamic science. The latter embraces a much wider realm, for it includes the world of the Spirit. That there are degrees of intuition has been amply demonstrated by Schuon, the greatest representative and exponent of the traditional perspective in the West today, in his numerous works[26]. The modern realm of intuitive ideas does

25. P. Medawar, *op. cit.*, pp. 109-110.

26. Examples of his works in which the question of intuition is dealt with in its various aspects are *Logic and Transcendence*, *Stations of Wisdom* (Middlesex: Perennial Books, 1980); *From the Divine to the Human* (Bloomington:World Wisdom Books, 1981).

known as the imaginal world, the Latin *mundus imaginalis* of the Islamic *'ālam al-khayāl*, an objective reality that stands between the physical and spiritual realms of existence[27]. We are not here denying the fact that creative and intuitive ideas that are the concern of modern mind have a practical import of their own in the scientific enterprise.

But we are also fully aware that modern science is currently wrestling with many problems of such an order that it is only through being receptive to ideas of higher levels of reality that true solutions to these problems can be found. We have in mind such problems as the question of the origin of life in the biological sciences, the ultimate reality of matter in physics, or the question of the origin of the physical universe in modern cosmology. However, as rationally argued by Ibn Sīnā, reception of these "higher" ideas is possible only if the mind is illuminated by the Active Intellect, but to be so illuminated, the intellect must be already illuminated by the light of faith, and touched by the grace issuing from revelation, for "the Spirit bloweth where it listeth". Intellectual intuition, says Schuon, demands the submission of all the powers of the soul to the pure Spirit which is identified, ontologically, with the fundamental dogma of Revelation[28].

If, in modern science, the problem of creativity and intuition is reduced to that of the human genius and sought to be formulated in terms of biological categories alone, traditional science, on the contrary, seeks to formulate the problem in terms of divine origin and the actualization, through the aid of divine agencies, of all the potentialities of the human intellect as conceived in the Divine Plan. This does not mean that, in the traditional formulation of the problem, human factors, both natural (biological and psychological) and cultural, are denied of their legitimate roles and importance. On the contrary, in the

27. See H. Corbin, *Creative Imagination in the Sufism of Ibn 'Arabi* (Princeton,1969) and also his *Spiritual Body and Celestial Earth: from Mazdean Iran to Shi'ite Iran*, (Princeton, 1977).
28. Schuon, *Dimensions of Islam*, p. 76.

the creation of the kind of total environment – physical, social and cultural, intellectual and spiritual – which is most conducive to such an actualization. In the case of Islam, this total environment is defined by the whole of its religious and spiritual universe which flows directly from the Quran, that objective and universal revelation which is the indispensable link between man and the Universe.

Faith in the Quranic revelation unveils all the possibilities that lie before the human intellect. Submission to revelation at all levels enables the intellect to actualize these possibilities to the extent grace from revelation makes it possible. The cultivation of the Muslim intellect is based upon a complete awareness of this principle. Within this perspective, it is a meaningul thing for a scientist of the stature of Ibn Sīnā, certainly one of the best scientific minds in the whole history of mankind, to often resort to prayer to seek God's help in solving his philosophical and scientific problems[29]. And it is also perfectly understandable why the purification of the soul is considered an integral part of the methodology of knowledge.

We all know too well that the central concern of Islam is with the protection and correct functioning of the human intelligence. Islam's obsession with intellectual health has to do with the fact that it has made intelligence the point of departure for man's salvation[30]. Earlier, we made the remark that the Quran, as God's objective revelation, enables man to realize the full potentiality of his intellect. This remark needs further comments. The religious and spiritual universe created out of the Quran at once removes impediments to the proper and full growth of the intellect and sustains all the nourishments necessary for its wholesomeness and healthy *(salīm)* growth, and, thus, its correct functioning. This Quranic universe provides a constant reminder to man of the divine origin

29. Nasr, *Islamic Cosmological Doctrines*, p. 181.
30. On this theme, see Schuon, *Understanding Islam*; and Nasr, *Ideals and Realities of Islam* (London: Allen & Unwin, 1971).

ground for reflection, meditation and contemplation, therefore prepares the intellect to be very receptive to ideas from the world of the Spirit. Islamic science, in fact, with all its methodologies and technological applications, has been conceived within the womb of the Quranic universe, although its historical ingredients, especially during the initial phase of its growth and development, may have been supplied from diverse sources.

After Nature itself, which is already Islamic, the first level of the religious and spiritual universe of Islam is that of the *Sharī'ah* which, all jurists agree, has as one of its highest objectives the protection and the healthy growth of the intellect. Since the *Sharī'ah*, which pertains to both thought (*īmān*) and action (*'amal*), does not exhaust the total meanings of the Quran, there must be other levels of submission to this objective revelation. The *Sharī'ah* is extracted out of the Quranic reality by applying the method of *tafsīr*. However, the domain of *tafsīr* does not extend beyond the external (*ẓāhir*) meanings of the revealed Book. The aspect of the *'aql* that is operative in the method of *tafsīr* is the rational faculty (reason), which is its reflection or outward projection onto the mental plane. The power of the rational faculty is analysis or ratiocination, and its instrument is logic. However, the extensive use of the rational faculty in the *tafsīr* of the Holy Book by *fuqahā'* (jurists), *mutakallimūn* (theologians), and the *falāsifah* (philosophers) did not lead to the kind of rationalism rampant in the modern world.

Rationalism is false not because it seeks to express reality in rational mode, so far as this is possible, but because it seeks to embrace the whole of reality in the realm of reason, as if the latter coincides with the very principle of things[31]. In *tafsīr*, the rational faculty is placed at the disposal of faith or revelation in the sense that it is called upon to present and expound the contents of Revelation in a rational manner to the best degree possible, whereas in modern thought it has been used to rebel against truth claims which lie outside its cognitive competence.

31. Schoun, *Stations of Wisdom*, p. 36.

does not depend on the epistemic status or truth-value of its premises, the "prior knowledge" which this demonstration aims at communicating. Rather, it depends on the correctness of its syllogistic reasoning. A possible role for revelation in the method of *tafsīr* is in furnishing data which might serve as the premises of rational or logical arguments, or as the criteria to judge the truth-value of conclusions established in such kinds of arguments.

The method of *tafsīr* is equally applicable to Nature, the cosmic text. In an analogous way, sciences of nature developed exclusively through this method necessarily remain at the level of external and literal meanings of the cosmic text, and as such cannot exhaust the reality of the cosmos, let alone the whole of Reality. In general, modern science, ever since its birth, has always been such a kind of science. Islam too had developed a science of the natural world based on a methodology which may be collectively referred to as *tafsīr*. But it developed this science alongside other sciences, which are based on some other methodologies. Moreover, limitations inherent in the methodology of *tafsīr* are duly recognized. As for modern science, it claims itself to be *the* science of nature, its methodology *the* methodology of knowledge, and, further, it harbors the illusion that, sooner or latter, through its very method of inquiry, nature will reveal its ultimate secrets to man, perhaps in the form of some mathematical formulae.

The methodology of *tafsīr* of the Holy Book, as it has been developed traditionally, including the method of linguistic analysis, must constitute an integral component of the overall methodology of Islamic science, which is sought to be revived in the modern world. The integration of *tafsīr* methodology into Islamic science is justified on the ground that the Book of Nature is the macrocosmic counterpart of the Holy Quran. The 8th/

32. On this question, see *ibid*, Chap. 1.

15th century Sufi master, 'Azīz al-Nasafī , in his *Kashf al-ḥaqā'iq*, compares Nature to the Quran in such a way that each genus in Nature corresponds to a *sūrah*, each species to a verse, and each particular being to a letter[33]. A *tafsīr* of the Holy Book necessarily involves a *tafsīr* of the phenomena of Nature itself.

The Quran contains many verses which lie beyond the competence of the method of *tafsīr* to reveal their meanings. In the same way, Nature presents before man many phenomena which cannot simply be reduced to categories of formal logic with which rationalism has been identified. At the frontiers of modern science today, we encounter numerous examples of such phenomena. In modern physics, there is a breakdown of logic when it comes to the question of the nature of light. The nature of light as being both continuous and discontinuous, that is, existing as both waves and corpuscles, is indeed a paradox of modern physics. Then, we have the phenomena of nothingness in atomic physics, the birth and death of symmetrical particles from "nothing" and to "nothing"[34], and the behavior observed of the electron, which suggests that it possesses a kind of intelligence. These phenomena have led a number of physicists to turn to oriental mysticism to seek a meaningful explanation to the problem. In so doing, they get entangled in issues which can no longer be considered scientific as this term is currently understood, but rather in issues of a religious and philosophical nature. There is no doubt that modern physics has encountered a new level of reality, namely, natural phenomena of a supra-logical and supra-rational order, which call for the application of another kind of methodology.

As applied to the Holy Book itself, the method of *tafsīr* must at some point give way to the method of *ta'wīl*. *Ta'wīl* or hermeneutic interpretation refers to the knowledge of the inner meaning of a sacred text. It is therefore concerned with the esoteric dimension of the Quranic revelation. In Islamic spiritual

33. See F. Meier, "Nature in the Monism of Islam" in Joseph Campbell (ed.), *Spirit and Nature* (Princeton, 1982), pp. 202-203.
34. Nasr, *Knowledge and the Sacred* (New York: Crossroad, 1981), p. 115.

tradition, this dimension has generally been identified with *tasawwuf* (Sufism), which may be defined as submission to God's objective revelation at the level of *iḥsān*, with respect to both thought (*īmān*) and action (*'amal*)[35]. As regards thought, *ta'wīl* is concerned with the intellectual dimension of *tasawwuf*, namely, the science of Reality whose central doctrine is the same principle of *tawḥīd* that is dealt with by *tafsīr*, but which is now understood and formulated at a higher level of meaning.

As regards action, *ta'wīl* is concerned with the spiritual dimension of *tasawwuf*, that is, a science of the soul or spiritual realization in which the ritual acts are basically the same as those prescribed and performed at the level of the *Sharī'ah*, but are sought to be interiorized at the deepest level possible. This is the level of submission of all the powers of the soul to the Pure Spirit. Traditional cosmology and traditional psychology[36], which are intimately related to each other, and which admit of various conceptual schemes, are formulated on the basis of this inner dimension of the Quranic revelation through the application of the method of *ta'wīl*.

The method of *ta'wīl* is employed not only in *tasawwuf*, but also in *fiqh* (jurisprudence) and *kalām* (theology) although with somewhat different connotations. As far as discussion of methodology of science is concerned, it is the method of *ta'wīl* as understood and applied in Sufism which is of particular interest to us. As it is understood in Sufism, *ta'wīl* is not opposed to *tafsīr*, but rather is an intensive form of the latter[37]. If the operational component of the *'aql* in the method of *tafsīr* is the rational faculty which exercises an analytical function by means of logic, then its component which is operative in the method of *ta'wīl* is

35. On the Quranic roots of *tasawwuf*, see Nasr, *Ideal and Realities of Islam*.
36. Huston Smith prefers to use the term 'pneumatology' for the science of the soul since the word 'psychology' as currently used denotes at best half the ground covered by traditional psychology. See his *Forgotten Truth*, p. 60.
37. For a treatment of *ta'wīl*, see, for example, al-Attas, S.M.N., *The Concept of Education in Islam* (Kuala Lumpur: ABIM, 1980); and Nasr, *Ideals and Realities of Islam*, pp. 58-61.

the intuitive faculty whose function is synthesis and unification, and whose chief instrument is symbolism. In the Sufi science of *ta'wīl* a symbol is distinguished from an allegory. A symbol is the "reflection", in a lower order of existence, of a reality belonging to a higher ontological status, a "reflection" which in essence is unified to that which is symbolized, while allegory is a more or less "artificial figuration" by an individual, having no universal existence of its own[38].

The dual aspects of the intellect, one rational, the other intuitive, are said to have manifested themselves at the level of the structure of the physical brain as well. Modern brain research has revealed a distinct separation or lateralization of cortical functions giving rise to an area of scientific investigation popularly known as "right and left mindedness". Carl Sagan describes this distinct separation as follows:

> The left hemisphere processes information sequentially, the right hemisphere simultaneously, accessing several inputs at once. The left hemisphere works in series; the right is parallel. The left hemisphere is something like a digital computer; the right like an analog computer[39].

The localization of intuitive aspects of thought in the right hemisphere of the brain is itself of great symbolic significance. It symbolizes the primacy of intellectual intuition over ratiocination. The famous French Egyptologist, Schwaller de Lubics, contends that intuitive vision was a major aspect of ancient science. Just as logical training can sharpen the mind, so can the cultivation of symbolic attitude sharpen intuitive vision. In several of his works on ancient Egyptian science, Schwaller de

38. In the words of al-Ghazzālī, there is not a single thing in this world of sense that is not a symbol of something in the higher world. It is through the science and method of symbolism, says he, that we comprehend the inner nature of the correspondence between the symbol and the symbolized. See his *Mishkāt al-anwār*, Englis trans. by W.H.T. Gairdner (Lahore: Muhammad Ashraf), pp. 121-125.
39. Carl Sagan, *The Dragons of Eden*, New York, p. 169.

Lubics shows that the ancient Egyptians, through their symbolic attitude, were able to cultivate the intellect to the extent of perceiving all of the phenomena of nature as a symbolic writing, revealing the forces and laws governing the physical as well as the spiritual aspects of our universe[40]. Islam, however, true to its manifestation as a religion of the middle way, was able to create within its civilization sciences of nature which extensively employed both the rational and intuitive faculties in a balanced manner and within a unified worldview.

We may speak of *ta'wīl* as an esoteric methodology which is inseparable from the question of spiritual transformation of man. The *ta'wīl* of the Holy Book, and correspondingly the *ta'wīl* of the cosmic text, both are linked to the *ta'wīl* of the human soul. The soul cannot return either text to its true, inner meaning unless the soul too returns to its transcendent source *(ḥaqīqah)*. What is implied here is a spiritual travail, the return of the soul to its Divine Origin. This doctrine served as the basis of purification of the soul, which is an integral part of the methodology of knowledge in Islam. This particular methodology has often been described as a higher kind of empiricism[41].

At this higher level of "empirical experience" the objects of observation and "experimentation" are no longer the external things, but the soul of the experimenter itself. What is now sought to be dominated and conquered is the animal nature within him. The experimentation consists of cleansing the rational soul from the impurities of nature and bodily forms, through asceticism and piety, until it becomes a pure substance. The soul then becomes illuminated and its highest faculty, the intellect, becomes functional. The intellect is then set to experience what we call intellectual intuition through which it perceives truth directly in the same manner the physical eye per-

40. Schwaller de Lubics, *Symbol and the Symbolic: Ancient Egypt, Science and the Evolution of Consciousness* (New York: Inner Traditions Int.,1978).
41. See al-Attas, S.M.N., *The Positive Aspects of Tasawwuf: Preliminary Thoughts on An Islamic Philosophy of Science* (Kuala Lumpur: Islamic Academy of Science, 1981), p. 6.

ceives the sensible world. There is a whole set of terms used in Islamic epistemology to describe this direct perception of the inner reality of things: *dhawq, ishrāq, mukāshafah, baṣīrah, naẓar, badīhah, ḥads* and *firāsah*[42], terms which all imply the knower's direct experience of the things known.

The application of the methodology of *ta'wīl* to the understanding of the natural world may help to reveal its divine roots. In this knowledge of the "divine roots" of physical things, are to be found the real answers to questions posed by modern science concerning the origin of the world of multiplicity.

Our whole discussion in this chapter may appear to some as too philosophical and mystical. However, we strongly believe that all the points we have raised are very much relevant to Islamic methodology of science. This methodology has to be deeply rooted in the revealed Book of Islam and in the spiritual tradition which issues forth from that revelation. In fact, it had been formulated and applied in history with remarkable success. This legacy is inherited by us today, although many Muslims are ignorant of it. It is not a mere historical coincidence that so many Muslim scientists were either practicing Sufis or intellectually attached to the Sufi perspective, as Professor Nasr's works have clearly demonstrated.

There is indeed a profound conceptual relationship between the inner dimensions of Islam, the depth and breadth of Muslim scientific minds, and sciences of nature that were cultivated in Islamic civilization. To revive Islamic science in the modern world requires that we once again pay due heed to that intimate link.

42. Nasr, "Intellect and Intuition . . .," pp. 36-37.

CHAPTER 3

The Place of Doubt in Islamic Epistemology : Al-Ghazzālī's Philosophical Experience

Authentic works attributed to Abū Ḥāmid Muḥammad al-Ghazzālī (450/1058–505/1111) are numerous, and they deal with a vast range of subjects. But the specific work of his which has given rise to many commentaries by scholars upon the problem of doubt in his philosophical system is *al-Munqidh min al-ḍalāl*[1] (Deliverence from Error).

This autobiographical work, written about five years before al-Ghazzālī's death and most probably after his return to teaching at the Maimūnah Niẓāmiyyah College at Naishapur in Dhu'l-qa'dah 499/July 1106, following a long period of retirement to a life of self-discipline and ascetic practices, has

1. The title of the book occurs in two readings. One is *Al-Munqidh min al-ḍalāl wa'l-muṣṣih 'an al-aḥwāl* (What Saves from Error and Manifests the States of the Soul); the other is *Al-Munqidh min al-ḍalāl wa'l-Muwaṣṣil (or: al-Mūṣil) ilā dhi'l-'Izza wa'l-Jalāl* (What Saves from Error and Unites with the Possessor of Power and Glory).

For an annotated English translation of this work, based upon the earliest available manuscript, as well as translations of a number of al-Ghazzālī's other works that are specifically mentioned in the *Munqidh*, see R. Joseph McCarthy, *Freedom and Fulfillment: An Annotated Translation of al-Ghazzālī's al-Munqidh min al-ḍalāl and Other Relevant Works of al-Ghazzālī* (Boston, 1980). For references to translations of the *Munqidh* into various languages, see p. xxv.

been variously compared by some present-day scholars with the *Confessions of St. Augustine*, with Newman's *Grammar of Assent* in its intellectual subtlety and as an *apologia pro vita sua*, and also with Bunyan's *Grace Abounding* in its puritanical sense[2]. More important, from the point of view of our present discussion, is the fact that this work has often been cited to support the contention that the method of *doubt* is something central to al-Ghazzālī's epistemology and system of thought, and that, in this question, al-Ghazzālī therefore anticipated Descartes (1596-1650)[3]. In fact, a number of comparative studies have been made concerning the place and function of *doubt* in the philosophies of the two thinkers.

Our aim in this chapter is to discuss the meaning and significance of *doubt* in the life and thought of al-Ghazzālī, not as an anticipation of the method of doubt or the sceptical attitude of modern western philosophy, but as an integral element of the epistemology of Islamic intellectual tradition to which al-Ghazzālī properly belongs. We will seek to analyze the nature, function and spirit of the Ghazzalian doubt. In discussing the above question, we are mindful of two important factors. One is the specific intellectual , religious, and spiritual climate prevailing in the Islamic world during the time of al-Ghazzālī, which no doubt constitutes the main external contributory factor to the generation of doubt in the early phase of his intellectual life. The other concerns the whole set of opportunities which Islam ever places at the disposal of man in his quest for certainty, and what we know of al-Ghazzālī's life tells us that he was very much exposed to these opportunities. Further, the spirit of the Ghazzalian doubt can best be understood when viewed in the context of the true purpose for which *al-Munqidh* has been written, and also in the light of his later works.

2. See M. 'Umaruddin, *The Ethical Philosophy of al-Ghazzālī* (Lahore, 1977), p. 286, note 2 to chap. IV; also, Wensinck, *La Pensée de Ghazzali*, p. 111.
3. See M. Iqbal, *The Reconstruction of Religious Thought in Islam* (Lahore: Iqbal Academy Pakistan & Institute of Islamic Culture, 1989), p. 102; M. Saeed Sheikh, "Al-Ghazzali: Metaphysics" in M. M. Sharif, *A History of Muslim Philosophy* (Wiesbaden, 1963), vol. 1, pp. 587-588; Sami M. Najm, "The Place and Function of Doubt in the Philosophies of Descartes and al-Ghazzālī"; and also W. Montgomery Watt, *The Faith and Practice of al-Ghazālī* (Chicago 1982), p. 12.

In *al-Munqidh*, al-Ghazzālī informs us of how in the prime of his life he was inflicted with a mysterious malady of the soul, which lasted for nearly two months during which time he "was a sceptic in fact, but not in utterance and doctrine"[4]. He was a student in his early twenties at the Niẓāmiyyah College in Naishapur when he suffered from this disease of scepticism.

What is the nature of this Ghazzalian doubt? Al-Ghazzālī tells us that his doubt has been generated in the course of his quest for certainty, that is, for knowledge of the reality of things "as they really are" *(ḥaqā'iq al-umūr)*[5]. This knowledge of the reality of things "as they really are" is what al-Ghazzālī calls *al-'ilm al-yaqīn*, a sure and certain knowledge which he defines as "that in which the thing known is made so manifest that no doubt clings to it, nor is it accompanied by the possibility of error and deception, nor can the mind even suppose such a possibility"[6]. Something ought to be said here about this inner quest of al-Ghazzālī, because it is very much relevant to the theme of our present discussion. In fact, the meaning of this quest should never be lost sight of if we want to understand correctly the nature and significance of the Ghazzalian doubt.

In Islam, the quest for *ḥaqā'iq al-umūr* originated with the famous prayer of the Prophet, in which he asked God to show him "things as they really are". This prayer of the Prophet is essentially the prayer of the gnostic inasmuch as it refers to a supra-rational or inner reality of things. And for this reason, the Sufis have been the most faithful and consistent of the believers in echoing this prayer of the Prophet. The famous

4. McCarthy, *op.cit.*, p.66.
5. Al-Ghazzālī, *Munqidh min al-ḍalāl*, p. 11. The text cited here is the one published together with its French translation by Farid Jabre, *Erreur et Deliverance* (Beirut, 1969).
6. McCarthy, *op. cit.*, p. 63.

Sufi, Jāmī (d. 1492), had this prayer beautifully expanded, capturing in an eloquent manner the very spirit of the gnostic's inner quest:

> O God, deliver us from preoccupation with worldly vanities, and show us the nature of things "as they really are". Remove from our eyes the veil of ignorance, and show us things as they really are. Show us not non-existence as existent, nor cast the veil of non-existence over the beauty of existence. Make this phenomenal world the mirror to reflect the manifestation of Thy beauty, not a veil to separate and repel us from Thee. Cause these unreal phenomena of the Universe to be for us the sources of knowledge and insight, not the causes of ignorance and blindness. Our alienation and severance from Thy beauty all proceed from ourselves. Deliver us from ourselves, and accord to us intimate knowledge of Thee[7].

Al-Ghazzālī's quest for certainty, as he has defined it, is none other than this quest of the gnostic. Initially, however, it was a purely intellectual quest. There were both internal and external forces at work in fueling that quest to the point of generating a period of intense doubt in the youthful life of al-Ghazzālī. Internally, by his own admission, his natural intellectual disposition has always been to grasp the real meaning of things. As for external forces, we have already referred to the most important of these, namely, the various intellectual, religious and spiritual currents of al-Ghazzālī's times, all of which must have engaged his highly reflective and contemplative mind. It is quite clear from the *Munqidh* that these various currents were of great concern to him.

In fact, al-Ghazzālī traced the genesis of his famous doubt to these currents. He was struck by the diversity of religions and creeds, and by the fact that the followers of each religion

7. Jāmī, *Lawā'ih, A Treatise On Sufism*, trans. E.H. Whinfield and M.M. Kazvini, (London: Royal Asiatic Society, 1914), p.2.

cling stubbornly to their inherited beliefs. One consequence of his critical reflection upon this religious phenomenon was that he began to question uncritically inherited religious beliefs *(taqlīdāt)*. But living as he was in an age in which the idea of Transcendence was very much a living reality in the souls of men, the problem of diversity of religions did not lead al-Ghazzālī to the kind of relativism that is rampant in modern times as a response to the same problem[8]. On the contrary, it was to lead him to the search for the inner reality of human nature, that is, man's primordial nature *(fiṭrah)*, which on the earthly plane becomes the receptacle for the multiplicity of religious forms and expressions.

Contrary to the view held by some modern interpreters of his thought, al-Ghazzālī was not against *taqlīd* as such. He never advocated at any time for its total abandonment. In fact, he considered it necessary for the simple believers whose minds are free of the kind of intellectual curiousity one finds in philosophers and scientists, and who are therefore content to accept things based on the authority of the experts. Al-Ghazzālī's criticism of *taqlīd* must be seen in the context of his quest for the highest level of certainty, a quest which, in fact, though not in principle, is the concern, not of the majority, but of the few like him. From the point of view of this quest, *taqlīd* is certainly a great impediment to its realization. Consequently, al-Ghazzālī let himself loose from the bonds of *taqlīd (rābiṭat al-taqlīd)*.

Here, one needs to make a clear distinction between *taqlīd*, which is a particular manner of acquiring ideas, and *taqlīdāt*, which are the ideas themselves. This distinction is somehow seldom noted by many students of Ghazzalian thought. Al-Ghazzālī's rejection of *taqlīd* for himself stemmed from his methodological criticism of its inherent limitations, while in accepting it for the simple-minded he was simply affirming an

8. For a profound critique of the modern interpretation of the meaning of diversity of religions, see F. Schuon, *Gnosis: Divine Wisdom* (Middlesex: Perennial Book, 1978), chap. 1.

important aspect of the subjective reality of the human order, namely, that individual human beings differ from one another in intellectual capability. The unreliability of *taqlīd* stems from the fact that it is susceptible to lending itself to both true and false *taqlīdāt*. The solution to the problem of false *taqlīdāt*, however, is not sought through the complete eradication of *taqlīd*, which is practically impossible, but through addressing oneself to the question of the truth or falsity of the *taqlīdāt* themselves. Thus, in the *Munqidh*, al-Ghazzālī tells us how, after reflecting upon the problem of *taqlīd*, he sought to sift out these *taqlīdāt*, to discern those that are true from those that are false[9]. A lot of his intellectual efforts were indeed devoted to this task.

For al-Ghazzālī, the positive function of *taqlīd*, namely, the acceptance of truths based on authority, is to be protected by those who have been entrusted with true knowledge, who constitute the legitimate authority to interpret and clarify knowledge about religious and spiritual matters. As it pertains to knowledge, another aspect of the reality of the human order affirmed by al-Ghazzālī is that there are degrees or levels of knowledge and, consequently, of knowers. This view has its basis in the Quranic verse which al-Ghazzālī quoted: "God raises in degrees those of you who believe and those to whom knowledge is given"[10]. In Islamic theory of knowledge, there is a hierarchy of intellectual and spiritual authorities culminating in the Holy Prophet, and ultimately God Himself. Faith *(īmān)*, which is a level of knowledge, says al-Ghazzālī, is the favorable acceptance *(ḥusn al-ẓann)*[11] of knowledge based on hearsay and experience of others, of which the most reliable is that of the Prophet.

There has been objection from certain modernist circles that the idea of admissibility of *taqlīd* for one group of people and its prohibition for another is socially unacceptable and even dangerous, for it can lead to the crystallization of a caste

9. Al-Ghazzālī, *Munqidh* . . ., p. 11.
10. *The Quran*, Chapter LVIII (The Woman who Pleads), Verse 11. See McCarthy, *op. cit.*, p.96.
11. Al-Ghazzālī, *Munqidh*, p.40.

system, which is against the very spirit of Islam. What has been said above is actually already sufficient to render this objection invalid. Nevertheless, we like to quote here the rebuttal of a scholar who has bemoaned the banishment of the Islamic idea of hierarchy of knowledge and of authorities at the hands of the modernists:

> "In respect of the human order in society, we do not in the least mean by 'hierarchy' that semblance of it wherein oppression and exploitation and domination are legitimized as if they were an established principle ordained by God . . . The fact that hierarchical disorders have prevailed in human society does not mean that hierarchy in the human order is not valid, for there is, in point of fact, *legitimate* hierarchy in the order of creation, and this is the Divine Order pervading all Creation and manifesting the occurrence of justice"[12].

It is this idea of the hierarchy of knowledge and of being which is central to al-Ghazzālī's epistemology and system of thought, and he himself would be the last person to say that such an idea implies the legitimization of a social caste system in Islam.

To sum up our discussion of al-Ghazzālī's methodological criticism of *taqlīd*, we can say that he was dissatisfied with it because it could not quench his intense intellectual thirst. It was obvious to him at that young age that *taqlīd* is an avenue to both truth and error, but as to what is true and what is false there was an open sea of debate around him, which disturbed him profoundly. It led him to contemplate upon one of the most central questions in philosophy, namely, the question of what true knowledge is, and this marked the beginning of an intensification of his intellectual doubt.

Besides the problem of the diversity of religions and creeds, in which a major issue was *taqlīd*, there was another, and more

12. al-Attas, S.M.N., *Islam and Secularism* (Kuala Lumpur: ABIM, 1978), p.101.

important, religious and spiritual current which contributed to the genesis of his doubt and which deeply affected his mind. This he mentioned as the existence of numerous schools of thought *(madhāhib)* and groups *(firaq)* within the Community of Islam itself, each with its own methods of understanding and affirming the truth and each claiming that it alone is saved. Al-Ghazzālī comments in the *Munqidh* that in this state of affairs of the Community, which he likens to "a deep sea in which most men founder and from which few only are saved", one finds the fulfilment of the famous promise of the Prophet: "My Community will split into seventy-odd sects, of which one will be saved".

The above religious climate was not peculiar to the times of al-Ghazzālī alone. A few centuries earlier, al-Ḥarīth b. Asad al-Muḥāsibī (165/781-243-837)[13], another famous Sufi, whose writings exercised a great influence on al-Ghazzālī, lamented the similar pitiful state of affairs into which the Islamic community has fallen. In fact, the autobiographical character of the *Munqidh* may have been modeled on the introduction to al-Muḥāsibī's work, *Kitāb al-wasāyā (or al-nasā'ih)*, which is also autobiographical in character[14].

The following extract from this work reveals striking similarities to certain passages in the *Munqidh*, and gives some indication as to the kind of religious climate prevailing during the time of al-Muḥāsibī:

> It has come to pass in our days, that this community is divided into seventy and more sects: of these, one only is the way of salvation, and for the rest, God knows best concerning them. Now I have not ceased, not so much as one moment of my life, to consider well the differences into which the community has fallen, and

13. On the life and teaching of this early Sufi figure, see Margaret Smith, *An Early Mystic of Baghdad: A Study of the Life and Teaching of Ḥārith ibn Asad al-Muḥāsibī* (London, 1935).
14. See A.J. Arberry, *Sufism: An Account of the Mystics of Islam* (London: Unwin Paperback, 1979), p.47.

> to search after the clear way and the true path, whereunto I have searched both theory and practice, and looked, for guidance on the road to the world to come, to the directing of the theologians. Moreover, I have studied much of the doctrine of Almighty God, with the interpretation of the lawyers, and reflected upon the various conditions of the community, and considered its diverse doctrines and sayings. Of all this I understood as much as was appointed for me to understand: *and I saw that their divergence was as it were a deep sea, wherein many had been drowned, and but a small band escaped therefrom; and I saw every party of them asserting that salvation was to be found in following them, and that he would perish who opposed them . . .*[15]

It is interesting to note that, although al-Ghazzālī's autobiographical work is more dramatic and eloquent than that of al-Muḥāsibī, both men were led into an almost similar kind of intellectual crisis through similar external circumstances. Both sought the light of certainty and that knowledge which guarantees salvation, and they found that light in Sufism. In the process, they accomplished a philosophical as well as a sociological analysis of knowledge, the details of which remain to be studied. But having said this much, we may add that al-Ghazzālī's philosophical discussion of *doubt (shakk)* and certainty *(yaqīn)* can still claim originality in more ways than one.

Having discussed the main factors which contributed to the generation of the Ghazzalian doubt, and to his formulation of the fundamental idea of "true knowledge" we now proceed to investigate into the philosophical meaning and significance of this doubt. We have seen earlier how al-Ghazzālī defined the kind of certain and infallible knowledge *(al-'ilm al-yaqīn)* which he was seeking. It is that knowledge which is completely

15. *Ibid*, pp.47-48, italics mine. Compare the italics portion with McCarthy, *op. cit.*, pp. 62-63.

free from any error or doubt, and with which the heart finds complete satisfaction. Is such a kind of certainty or certitude possible? It is significant that al-Ghazzālī never explicitly posed that question. But, armed with the above criteria of certainty, he proceeded immediately to scrutinize the whole state of his knowledge. He found himself "devoid of any knowledge answering the previous description except in the case of sense-data *(ḥissiyyāt)* and the self-evident truths *(ḍarūriyyāt)*[16]." He then set out to induce doubt *(tashkīk)* against his sense-data to determine whether they could withstand his test of infallibility and indubitability. The outcome of this effort, in which reason *('aql)* appeared as judge over the claims of the senses to certitude, was that his reliance on sense-data proved no longer tenable. The charge of falsity leveled by reason against sense-perceptions could not be rebutted by the senses.

With his reliance on sense-data shattered, al-Ghazzālī sought refuge in the certainty of rational data which "belong to the category of primary truths, such as our asserting that 'Ten is more than three', and 'One and the same thing cannot be simultaneously affirmed and denied', and 'One and the same thing cannot be incipient and eternal, existent and non-existent, necessary and impossible'"[17]. However, this refuge in the rational data *('aqliyyāt)* too was not safe from elements of doubt. This time, doubt crept in through an objection, made on behalf of sense-data, against the claims of reason to certitude.

As explained in the *Munqidh*, these claims of reason are not refuted in the same way reason itself has earlier refuted the claims of the senses. They are merely subjected to doubt by means of analogical argumentations. Still, it is a doubt which reason proves unable to dispel in an incontrovertible manner. Reason is reminded of the possibility of another judge superior to itself, which if it were to reveal itself would "give the lie to

16. McCarthy, *op. cit.*, p. 64.
17. *Ibid*, p.65.

the judgments of reason, just as the reason-judge revealed itself and gave the lie to the judgments of sense"[18]. The mere fact of the non- appearance of this other judge does not prove the impossibility of its existence.

This inner debate within the soul of al-Ghazzālī turned for the worse when its suggestion of the possibility of another kind of perception beyond reason was reinforced by various kinds of evidences and argumentations. First of all, an appeal was made to reason to exercise the principle of analogy to the phenomena of dreaming. Through this principle, reason would have realized that the relation of this suggested supra-rational state to our waking state, when the senses and reason are fully functional, is like the relation of the latter to our dreaming state. If our waking state judges our imaginings and beliefs in the dreaming state to be groundless, the supra-rational state likewise judges our rational beliefs.

This argumentation appears as if al-Ghazzālī, himself one of the most respected jurists, was addressing the jurists and other proponents of reason, who were well-versed with the principle of analogy. We are not suggesting here that these targeted groups were in al-Ghazzālī's mind at the time he was experiencing this inner debate. His indirect reference to them could well have surfaced at the time of his writing the *Munqidh* inasmuch as this work was written with a view of impressing upon the rationalists that Islamic epistemology affirms supra-rational perceptions as the real key to knowledge. Thus, al-Ghazzālī reproaches the rationalists in the *Munqidh*: "Therefore, whoever thinks that the unveiling of truth depends on precisely formulated proofs has indeed straitened the broad mercy of God"[19].

Next to confront reason in support of the possibility of a supra-rational state was the presence of a group of people called the Sufis, who claimed that they had actually experienced that state. They alleged that during their experience of these supra-

18. *Ibid.*
19. *Ibid*, p.66.

rational states, they saw phenomena which are not in accord with the normal data of reason. Finally, the last piece of evidence brought to the attention of reason is the prophetic saying, "Men are asleep: then after they die they awake", and the Quranic verse "Thou was heedless of this; now have We removed thy veil, and sharp is thy sight this day"[20]. Both the ḥadīth and the Quranic verse quoted refer to man's state after death, and reason is told that, may be, this is the state in question.

All these objections to the claim of reason to have the final say to truth could not be refuted satisfactorily by reason. The mysterious malady of al-Ghazzālī's soul, which lasted for nearly two months, is none other than this inner tussle or tension between its rational faculty and another faculty which mounts an appeal to the former, through the senses, to accept its existence and the possibility of those experiences that have been associated with its various powers, such as those claimed by the Sufis. This other faculty, which is supra-rational and supra-logical, is the intuitive faculty which, at this particular stage of al-Ghazzālī's intellectual life, had not yet developed beyond the mere ability to theorize and acknowledge the possibility of supra-rational experiences. Later, during a period of intense spiritual life, he claimed to have been invested with higher powers of the faculty, which disclosed to him innumerable mysteries of the spiritual world[21]. These powers al-Ghazzālī termed *kashf* (direct vision) and *dhawq* (translated as *fruitional experience* by McCarthy, and *immediate experience* by Watt)[22].

The gradational movement from sense-data to rational data presented no serious difficulty, but the first direct encounter between his rational and intuitive experiences proved to be a painful one for al-Ghazzālī. His two-month period of being

20. *The Quran*, Chapter L (*Qaf*), Verse 22.
21. McCarthy, *op. cit.*, p.94.
22. *Ibid*, p.95; Watt, *op. cit.*, p.62. On the various terms used in Islamic thought for intuition, and on the question of the relationship between intellect and intuition in the Islamic perspective, see Nasr, "Intellect and Intuition. . ."

"sceptic in fact, but not in utterance and doctrine" was the period of having to endure intense doubts about the reliability of his rational faculty in the face of certain assertive manifestations of the intuitive faculty. His problem was one of finding the rightful place for each of the human faculties of knowing within the total scheme of knowledge, and, in particular, of establishing the right relationship between reason and intuition, as this latter term is traditionally understood.

Thus, when he was cured of this sickness, not through rational arguments or logical proofs but through the effect of a light *(nūr)* which God cast into his breast, his intellectual equilibrium was restored, and he once again accepted the reliability of rational data of the category of *ḍarūriyyāt*. However, in this newfound intellectual equilibrium, reason no longer occupied the dominant position it used to have. In al-Ghazzālī's own words, that light which God cast into his breast is the key to most knowledge[23].

We do not agree with the view of certain scholars that the method of doubt is something central to al-Ghazzālī's epistemology and system of thought. The *Munqidh* does not support the view that al-Ghazzālī was advocating systematic doubt as an instrument in the investigation of truth[24]. And there is nothing to be found in it, which is comparable to Descartes' assertion that "it is necessary once in one's life to doubt of all things, so far as this is possible"[25]. This brings us to the question of the true nature of al-Ghazzālī's first personal crisis.

McCarthy describes al-Ghazzālī's crisis of scepticism as an epistemological crisis, which is of the intellect alone, in contrast to his second personal crisis which is a crisis of conscience, and of the spirit[26]. Father Poggi, whose *Un Classico della Spiritualita Musulmana* is considered by McCarthy to be one of the finest studies on al-Ghazzālī and the *Munqidh*, does not

23. Al-Ghazzālī, *Munqidh*. . ., p. 13.
24. This view is discussed in Sami M. Najm, *op. cit.*
25. Descartes, *Principles*, pt. 1, 1 in *The Philosophical Works of Descartes*, trans. E.S. Haldane and G.R.T. Ross, (New York, 1955).
26. McCarthy, *op. cit*, p.xxix.

consider the youthful scepticism of al-Ghazzālī as real but purely a *methodical* one[27]. Another celebrated Italian Orientalist, Guiseppe Furlani, also agrees that the doubt of al-Ghazzālī is not that of a sceptic, but rather of a critic of knowledge[28].

We agree with the common view of these scholars that, at the time of his crisis, al-Ghazzālī was neither a philosophical nor a religious sceptic, and that the crisis was an epistemological or methodical one. The *Munqidh* provides ample evidence to support this view. Al-Ghazzālī was not a philosophical sceptic because he never contested the value of metaphysical certitude. He was always certain of the *de jure* certitude of truth. Thus, as we have earlier mentioned, he never questioned the possibility of knowledge of *ḥaqā'iq al-umūr*. His natural, intellectual disposition toward seeking that knowledge was, in a way, an affirmation of his personal conviction in the *de jure* certitude of truth.

According to Schuon, it is the agnostics and other relativists who sought to demonstrate the illusory character of the *de jure* certitude of truth by opposing to it the *de facto* certitude of error, as if the psychological phenomenon of false certitudes could prevent true certitudes from being what they are and from having all their effectiveness and as if the very existence of false certitudes did not prove in its own way the existence of true ones[29]. As for al-Ghazzālī, he never fell into the above philosophical temptation of the agnostics and relativists. His doubt was not of truth itself, but of modes of knowing and modes of accepting truth. But, since by truth, he meant here the inner reality of things, his quest for that reality also implied a quest for its corresponding mode of knowledge.

27. Vincenzo M. Poggi, *Un classico della Spiritualita Musulmana* (Rome: Libreria dell' Universita Gregoriana, 1967), p. 171.
28. Giuseppe Furlani, "Dr. J. Obermann, Der philos. und regligiose Subjektivismus Ghazalis," (Recensione) in *Revista trimestrale di studi filosoficie religiose*, vol.III, no.2, pp. 340-53. (Perugia, 1922). McCarthy in his above cited work provides an English translation of some excerpts from Furlani's above review, see pp. 388-390.
29. F. Schuon, *Logic and Transcendence*, p.44.

His criticism of all modes of knowing that were then within his practical reach was motivated by a real theoretical awareness of the possibility of another mode of knowing, which the Sufis claim as theirs. In the case of al-Ghazzālī, this possibility must have agitated his mind right from the time it was first impressed upon him through his direct personal encounter with the way of the Sufis. We may recall here the early educational background of al-Ghazzālī. It was an education which was permeated by a strong influence of Sufism. His father, says al-Subkī, was a pious dervish who spent as much time as he could in the company of the Sufis[30].

The first teacher to whom his early education was entrusted was a pious Sufi friend of his. Studying together with him then was his younger brother, Aḥmad al-Ghazzālī (d. 1126) who, though less famous, later made his mark as a great Sufi whose disciples include 'Abd al-Qāhir Abū Najīb al-Suhrawardī (d. 1168), the founder of the Suhrawardiyyah Order, and most probably, as believed by a number of scholars, al-Ghazzālī himself. As a student at Naishapur, one of the subjects he studied was Sufism. He also became a disciple to the Sufi, Abū 'Alī al-Faḍl ibn Muḥammad ibn 'Alī al-Fārmadhī al-Ṭūsī, who was a pupil of al-Qushairī (d. 465/1074). Al-Ghazzālī learnt from al-Fārmadhī (d. 477/1084) the theory and practice of Sufism and, under the latter's guidance, even indulged in certain ascetic and spiritual practices.

He was increasingly attracted to the idea of a direct personal experience of God emphasized by the Sufis. However, he felt a bit disheartened when, in these early attempts at following the Sufi path, he failed to attain that stage where the mystics begin to receive pure inspiration from "high above"[31]. In the light of this background, there is a strong reason to believe that Sufism plays a central role in leading al-Ghazzālī to his

30. Al-Subkī, *Ṭabaqāt al-shāfi'iyyah al-kubrā* (Cairo, 1324/1906), vol. IV, p. 102, quoted in M. Saeed Sheikh, *op. cit.*, pp. 582-283.
31. Ibn Khallikān, *Wafayāt al-a'yān*, English translation by de Slane, (Paris, 1842-1871), vol. II, p. 122.

epistemological crisis. Al-Ghazzālī's doubt of the trustworthiness of reason was not generated from "below" or by the reflection of reason upon its own self, but was suggested from "above" as a result of his acquaintance with the Sufi's mode of knowledge, which claims to be supra-rational and which "offers its own critique of reason". Likewise, the doubt was removed not through the power of reason, but from "above" as a result of the light of divine grace, which restores to each faculty of knowledge its rightful position and its validity and trustworthiness at its own level.

Al-Ghazzālī was also never at any time a religious sceptic. He tells us in the *Munqidh* that, throughout his quest for certainty, he always had an unshakable belief in the three fundamentals of the Islamic faith:

> "From the sciences which I had practiced and the methods which I had followed in my inquiry into the two kinds of knowledge, revealed and rational, I had already acquired a sure and certain faith in God Most High, in the prophetic mediation of revelation, and in the Last Day. These three fundamentals of our Faith had become deeply rooted in my soul, not because of any specific, precisely formulated proofs, but because of reasons and circumstances and experiences too many to list in detail."[32]

The above quotation is yet another evidence provided by the *Munqidh* that al-Ghazzālī's so called scepticism is not to be equated with the scepticism encountered in modern western philosophy. The doubting mind of al-Ghazzālī was never cut off from revelation and faith. On the contrary, it was based upon a "sure and certain" faith in the fundamentals of religion. As for the doubting mind of the modern sceptic, it is cut off from both the intellect and revelation and, in the pursuit of its directionless activity, it has turned against faith itself. Now,

32. McCarthy, *Munqidh* . . ., pp. 90-91.

what is the distinction between the "sure and certain" faith which al-Ghazzālī always had and that certainty which he was ever eager to seek? We will deal briefly with this question because in its very answer lies the significance of the Ghazzalian doubt and also because charges have been leveled against al-Ghazzālī by scholars like J. Obermann[33] that his haunting doubts of objective reality led him to find sanctuary in religious subjectivism.

The answer to the above question is to be found in the idea of certainty *(yaqīn)* in Islamic gnosis. There are degrees of certainty: in the terminology of the Quran, these are *'ilm al-yaqīn* (science of certainty), *'ayn al-yaqīn* (vision of certainty) and *ḥaqq al-yaqīn* (truth of certainty). These have been respectively compared to hearing about the description of fire, seeing fire and being consumed by fire[34]. As applied to al-Ghazzālī's quest for certainty, the "sure and certain" faith, which he claimed he had acquired from his inquiry into the various sciences, referred to *'ilm al-yaqīn*, since his acceptance of the truths concerned was inferential in nature, based as it was upon data furnished by revelation and the authority of the Prophet. In other words, at the level of faith, the particular truth which is the object of the faith is not known directly or with immediacy. Nevertheless, to the extent that in one's act of faith one participates in the truth through both reason and heart, faith already implies a particular level of knowledge and of certainty. Thus, from the beginning of al-Ghazzālī's quest for the true knowledge of the Real, a certain element of certitude was always present.

In the *Kitāb al-'ilm* (Book of Knowledge) of his *magnum opus, Iḥyā' 'ulūm al-dīn* (The Revivification of the Religious Sciences), al-Ghazzālī discussed the usage of the term *yaqīn* by the major intellectual schools of Islam up to his time. He

33. J. Obermann, *Der philosophische und religiose Subjektivismus Ghazzalis' Ein Beitrag zum Problem der Religions* (Wien und Leipzig, 1921), p. 20.

34. See Nasr, *Knowledge and the Sacred* (New York: Crossroad, 1981), p.325; also Abu Bakr Siraj al-Din, *The Book of Certainty* (New York, 1974).

identified two distinct meanings to which the term was being applied. In one group were the philosophers *(nuẓẓir)* and the theologians *(mutakallimūn)*, who employed the term to signify lack or negation of doubt, in the sense that the knowledge or the truth in question is established from evidence which leaves no place for any possibility of doubt[35]. The second meaning of the term *yaqīn* was the one adopted by the jurists and the Sufis as well as most of the learned men. *Yaqīn*, in this case, refers to the intensity of religious faith or fervor which involves both the acceptance, by the soul, of that which "prevails over the heart and takes hold of it" and the submission of the soul to that thing in question.

For al-Ghazzālī, both kinds of *yaqīn* need to be strengthened, but it is the second kind of *yaqīn* which is the nobler of the two, since without it serving as an epistemological basis for the first kind of *yaqīn*, the latter would definitely lack epistemic substance and value. Moreover, it fosters religious and spiritual obedience, and praiseworthy habits. In other words, philosophical certainty is of no value if it is not accompanied by submission to the truth and by the transformation of one's being in conformity with that truth. Although the jurists and the Sufis both have been identified with the second kind of *yaqīn*, they are generally concerned with different levels of *yaqīn*. The Sufis are basically concerned with a direct or immediate experience of the Truth, and with submission to the Pure Spirit not merely at the level of external meanings of the *Sharī'ah* (Divine Law) but at all levels of the selfhood. For this reason, the degrees of certainty earlier mentioned properly belong to *ma'rifah* (Islamic gnosis) rather than to *fiqh* (jurisprudence). In al-Ghazzālī's popular terminology in the *Iḥyā'*, these belong to *'ilm al-mukāshafah* (science of revelation) and not to *'ilm al-mu'āmalah* (science of practical religion).

35. Al-Ghazzālī, *Kitāb al-'ilm*, English trans. by Nabih Amin Faris, (Lahore, 1974), pp. 193-194.

Reverting back to al-Ghazzālī's "sure and certain faith", there are, with respect to his ultimate goal, deficiencies both in his modes of knowing and in the submission of his whole being. Deficiency in the former was a root cause of his first personal crisis which, as we have seen, was epistemological in nature. Deficiency in the latter had a lot to do with his second personal crisis which was spiritual, although the two crisis are not unrelated. We have identified al-Ghazzālī's "sure and certain faith" with certainty at the level of *'ilm al-yaqīn* which refers to a particular manner of participation in the Truth. Objectively, if doubts could be generated about the trustworthiness of *'ilm al-yaqīn* as being the highest level of certainty, it is because a higher level of certitude is possible, for as Schuon profoundly says, if man is able to doubt, this is because certitude exists[36].

Al-Ghazzālī's acquaintance with the methodology of the Sufis made hime aware of the *de jure* certitude of truth of a higher level. At the time of his epistemological crisis, he was only certain of this certitude in the sense of *'ilm al-yaqīn*. After the crisis, as a result of the light of intellectual intuition which he received from Heaven, that certainty was elevated to the level of *'ayn al-yaqīn*. This newfound certainty was not the end of al-Ghazzālī's intellectual and spiritual quest. He had a longing for the mystical experience of the Sufis. He had indulged in some of their spiritual practices but without success in terms of fruitional experience. This must have been a lingering source of inner discontent in him. He was to realize later his major fault: he was too engrossed in worldly desires and ambitions such as fame and fortune[37], while the efficacy of spiritual practices presupposes a certain frame of mind and a certain level of spiritual virtues like the sincerity of one's intention.

Al-Ghazzālī mentions in the *Munqidh* that immediately after his first crisis was over, he proceeded to study with greater

36. Schuon, *op. cit.*, p.13.
37. McCarthy, *op. cit.*, p.91.

thoroughness the views and methods of the various seekers of the Truth. He divided the seekers into four groups. These were "the *mutakallimūn* (theologians) who allege that they are men of independent judgment and reasoning; the *bāṭinites* who claim to be the unique possessors of *al-ta'līm* (authoritative instruction) and the privileged recipients of knowledge acquired from the Infallible *Imām*; the philosophers who maintain that they are the men of logic and apodeictic demonstration; and finally the Sufis who claim to be the familiars of the Divine Presence and the men of mystic vision and illumination"[38]. There is no doubt that al-Ghazzālī had undertaken this comparative study of all the classes of seekers of the Truth with the view of exhausting all the possibilities and opportunities that were open to him in the pursuit of the highest level of certainty, although by then one could already detect in him a special inclination and sympathy toward Sufism.

At the end of this thorough study, he came to the conclusion that "the Sufis were masters of states *(arbāb al-aḥwāl)* and not purveyors of words *(aṣḥāb al-aqwāl)*"[39]. He also came to realize that there was a great difference between theoretical knowledge and realized knowledge. To illustrate the difference he gave the following example. There is a great difference between our *knowing* the definitions, causes, and conditions of health and satiety and our *being* healthy and sated, between our *knowing* the definition of drunkenness and our *being* drunk, and between our *knowing* the true nature and conditions of asceticism and our actually *practicing* asceticism. Certitude derived from realized knowledge is what *ḥaqq al-yaqīn* is. This knowledge is free from error and doubt because it is not based on conjecture or mental concepts, but it resides in the heart and thus involves the whole of man's being[40].

Realized knowledge, however, demands the transformation of the knower's being. The distinctive characteristic of the Sufi

38. *Ibid*, p. 67.
39. Al-Ghazzālī, *Munqidh* . . . p.35.
40. Nasr, *op. cit.*, p.325.

mode of knowledge, says al-Ghazzālī, is that it seeks the removal of deformations of the soul such as pride, passional attachment to the world and a host of other reprehensible habits and vicious qualities, all of which stand as obstacles to the realization of that knowledge, in order to attain a heart empty of all save God and adorned with the constant remembrance of God[41]. This led al-Ghazzālī to reflect upon his own state of being. He realized the pitiful state of his soul and became certain that he was "on the brink of a crumbling bank and already on the verge of falling into the Fire"[42] unless he set about mending his ways. Before him now lies the most important decision he has to make in his life. For about six months he incessantly vacillated between the contending pull of worldly desires and the appeals of the afterlife. This is al-Ghazzālī's second personal crisis which is spiritual and far more serious than the first, because it involves a decision of having to abandon one kind of life for another which is essentially opposed to the former. He tells us how, at last, when he has completely lost his capacity to make a choice, God delivers him from the crisis by making it easy for his heart to turn away from the attractions of the world. In the spiritual path of the Sufis, al-Ghazzālī found the light of certainty that he has tirelessly sought from the beginning of his intellectual awareness of what that certainty is.

It is therefore in the light of Islamic epistemology and, especially in the light of the idea of degrees of certainty *(yaqīn)* in Islamic gnosis that the famous Ghazzalian doubt should be studied and understood. When al-Ghazzālī turned to his own inner being to find the light of certainty, it was not an exercise in religious subjectivism or an act of disillusionment with objective reality, as maintained by scholars like Obermann and Furlani. On the contrary, al-Ghazzālī was drawn to the highest objective reality that is. The Ultimate Truth underlying objective

41. McCarthy, *op. cit.*, p.90.
42. *Ibid*, p.91.

reality is identical to the Supreme Self underlying human selfhood or man's subjective consciousness. The intellectual and spiritual tradition in which al-Ghazzālī lived and thought made him fully aware of the fact that what veils man from this highest reality is the darkness of his own soul. Therefore in turning to his own inner being, al-Ghazzālī was merely following that traditional path which alone could guarantee, by divine grace, the removal of that veil. This is the universal path of all the real seekers of the Truth, of which al-Ghazzālī was an outstanding example.

CHAPTER 4

The Unity of Science and Spiritual Knowledge: The Islamic Experience

Science, understood in the restricted sense of an organized, orderly and objective knowledge of the natural order, is not the product of the modern mind alone. Such forms of knowledge had also been extensively cultivated in pre-modern civilizations such as in the Chinese, Indian, and Islamic civilizations. These pre-modern sciences, however, differ from modern science with respect to goals, methodology, sources of inspiration, and their philosophical assumptions concerning man, knowledge, and the reality of the natural world.

Another major difference between pre-modern and modern sciences pertains to the place of science in relation to other kinds of knowledge. In pre-modern civilizations, science was never divorced from spiritual knowledge. On the contrary, one finds an organic unity of science and spiritual knowledge. The main aim of this chapter is to explain how this unity was achieved in pre-modern times. My specific reference is to the Islamic scientific tradition. However, many of the features of Islamic science mentioned here equally apply to the other pre-modern sciences.