Islam, Science, Muslims, and Technology: Seyyed Hossein Nasr in Conversation with Muzaffar Iqbal brings into sharp relief important dilemmas faced by the Muslim world today, especially in reference to modern science and technology. In four focused conversations Seyyed Hossein Nasr responds to Muzaffar Iqbal in exploring Islamic views on the origin of the cosmos and life, various dimensions of the relationship between Islam and science, Muslim attitudes toward modern science and technology, and the environmental crisis. At the heart of these wide-ranging conversations is what can perhaps be called the most pressing issue of our times: the future course of Islamic civilization.

Spanning the entire spectrum of Islamic thought, these conversations are supplemented by three related texts: "The Context" sketches, in bold strokes, the background to these conversations; "The Cosmos as a Subject of Scientific Study" explores various aspects of the relationship between God, the cosmos, and humanity; and "The Islamic Worldview and Modern Science" is the text of the keynote address delivered by Seyyed Hossein Nasr at the International Conference on Science in Islamic Polity in the Twentieth Century held in Islamabad, Pakistan in March 1995—an occasion which brought the two scholars together for the first time and initiated a lifelong spiritual, intellectual, and emotional association.

By situating Islamic responses to modern science and technology within the historic encounter of Islamic civilization with the post-Renaissance Western civilization, the book provides reflective insights into the challenges faced by Islamic civilization as it struggles to preserve its spiritual character and tradition.

Islam, Science, Muslims, and Technology is accessible to both the general reader and the specialist. It provides a theoretical framework for understanding the nature of the dilemmas faced by the Muslim world, while also suggesting practical solutions. The book opens numerous paths for readers to gain deeper insights into some of the most important issues of our times.

Also by Muzaffar Iqbal

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Seyyed Hossein Nasr

in Conversation with

Muzaffar Iqbal

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Verily, in the creation of the heavens and the earth, and in the succession of night and day, there are signs for those who are endowed with insight.

(*Āl-ʿImrān*: 190)

Contents

Transliteration Scheme

ء	ʾ	ز	z	ق	q
ب	b	س	s	ك	k
ت	t	ش	sh	ل	l
ث	th	ص	ṣ	م	m
ج	j	ض	ḍ	ن	n
ح	ḥ	ط	ṭ	و	w
خ	kh	ظ	ẓ	ي	y
د	d	ع	ʿ	ة	*-ah* or *-at*
ذ	dh	غ	gh	ال	article *al-*
ر	r	ف	f		

Short vowels	Long vowels	Diphthongs
ـَ a	ا ـَ ā	ـَو aw
ـُ u	و ـُ ū	ـَي aẏ
ـِ i	ي ـِ ī	

Preface

This book consists of three self-contained and interrelated sections exploring various dimensions of the relationship between Islam, science, Muslims, and technology. The first section, consisting of two chapters, sets the broad framework for the four conversations that follow.

In "The Context" Muzaffar Iqbal sketches, in bold strokes, the background to these conversations and situates them in the larger context of the Islam and science discourse. "The Cosmos as a Subject of Scientific Study" by Seyyed Hossein Nasr explores various aspects of the relationship between God, the cosmos, and humanity, and serves as a theoretical framework for the conversations which constitute the second section of the book.

The second section contains four interview-styled conversations between Seyyed Hossein Nasr and Muzaffar Iqbal originally published in the journal *Islam & Science*. Spanning the entire spectrum of Islamic thought, these conversations explore a variety of issues including the relationship between Islam and science, Muslim attitudes toward modern science and technology, differences between that science which existed in Islamic civilization prior to the modern era and modern science, Islamic perspectives on biological origins, and the impact of modern science and technology on Islamic thought and civilization.

The third section, "The Islamic Worldview and Modern Science", contains the text of the keynote address delivered by Seyyed Hossein Nasr at the International Conference on Science in Islamic Polity in the Twenty-First Century, held at Islamabad in March 1995—an occasion which brought the two scholars together for the first time and initiated a life-

long spiritual, intellectual, and emotional association.

A book of this nature cannot avoid a certain degree of repetitiveness while exploring its central themes. This repetition, however, serves to underscore different dimensions of the discourse and adds to the richness of the dialogue. The book is also stylistically heterogeneous due to the presence of research articles, conversations, and a keynote address in a single volume. This variety, however, makes the book accessible to a larger readership.

1

The Context

On a bright spring day, I stood inside the large arrival hall of the Islamabad International Airport waiting for Professor Nasr. It was that season when the jasmine and jacaranda trees don that wonderful attire of new colors which creates longing and thirst for the beatific vision in initiated hearts. Nasr was our keynote speaker for the International Conference on Science in Islamic Polity in the Twenty-First Century, which was to be held on March 26-30, 1995. The Conference had been organized by the OIC Standing Committee on Scientific and Technological Cooperation (COMSTECH), an inter-governmental body established by the Organization of Islamic Conference (OIC) in 1983 to improve the state of scientific research in the Muslim world and to enhance cooperation among member states in the twin fields of science and technology. COMSTECH worked under the direct supervision of the President of Pakistan, who was going to be the chief guest at the inaugural session of the Conference.

I had never met Professor Nasr before, but I recognized him immediately when he entered the hall along with the other passengers. He looked fresh despite the long journey. He walked to the immigration desk, completed the usual formalities and went to the conveyer belt where the flight's luggage had just started to arrive. I went to where he was standing and greeted him.

"*As-salāmu ʿalaykum*."

"You must be Dr. Iqbal," he said, embracing me.

This was our first encounter in person, though we had been corresponding for some time and I had known him through his writings for many years.

He asked questions about the Conference as we were driven toward the hotel. He was pleased to know that there were to be over seventy international participants. He recalled an earlier conference held in 1983 which had also drawn considerable interest among scholars interested in the relationship between Islam and science. I noted the similarities but commented that our vision for this conference was different: we were hoping to use the platform of the Conference to launch a major initiative for moving ahead in the discourse on Islam and science.

Once at the hotel, I left with him two draft proposals, one calling for the establishment of a Muslim Scientists and Scholars' Forum (MSSF), the other for an International Institute of Science Studies in Islamic Polity (ISSIP). These were the two dreams I had nurtured over the past years while working at COMSTECH, which I had joined in 1991 when I returned to my native Pakistan after a decade-long sojourn in the West. After spending many years in laboratories and studying the nature of the Western scientific enterprise in considerable detail, I had gained experiential proof of the veracity of Professor Nasr's position on Western science and technology and their impact on Islamic polity. I was convinced that what he had so eloquently expressed in his various writings over the past forty years needed to be put into practice for a better understanding of the nature of modern science by Muslims. This had led to the idea of gathering prominent Muslim thinkers in Islamabad for a conference that would generate enough momentum to create an institutional base for the purpose of furthering such an understanding of modern science and its impact on the Muslim world.

The Muslim Scientists and Scholars' Forum was to engage working Muslim scientists and scholars to generate a body of literature that critically examined the metaphysical

and philosophical foundations of modern science. It was to have six focal points, one each in Ankara, Cairo, Tehran, Kuala Lumpur, London, and Washington, and a headquarter in Islamabad. Each focal point was to establish a group of 20 to 25 scholars and scientists. The intent was to move from theoretical critique to practical steps in realizing the goals of an alternate science based on the vision of Islam.

The International Institute of Science Studies in Islamic Polity was to (i) carry out studies in the history and philosophy of science and technology; (ii) assess the present potential and capability of scientific research in the Muslim world; (iii) plan future science and technological research relevant to the Muslim *Ummah*; and (iv) engage Muslim scientists in studies on the history and philosophy of science. One of the goals of the Institute was to explore ways in which contemporary science could be integrated into the Islamic worldview.

Another goal of the Conference was to seek enhanced participation of certain historians of science and scholars interested in the relationship between Islam and science in COMSTECH's quarterly journal, *Islamic Thought and Scientific Creativity*.

We had spent more than six months in planning this Conference. In addition to the COMSTECH Secretariat, many agencies of the Government of Pakistan were involved. This included the Foreign Office, various security agencies, the Ministry of Science and Technology, and the President's office, mainly because the President of Pakistan was the Chairman of COMSTECH. The Jeddah-based Secretariat of the Organization of Islamic Conference had sent a delegation. Many senior Pakistani scientists were also actively participating in the Conference. All of this enthusiasm was, however, dampened by certain unexpected events on the day of the Conference.

That morning, Pakistan's largest English-language newspaper carried an article by an ardent critic of the Islamization of science project. Written in scathing language, "The Circus Comes to Town Again" brought into sharp relief certain misconceived efforts by some Muslims

to discover modern science in the Qurʾān. It quoted examples of "Islamization of science" from certain papers read at the 1983 Conference in which some Muslims had presented absurd ideas such as calculating the number of angels on a pinhead or the distance between heaven and earth by utilizing Qurʾānic verses and quantum mechanics. This, however, was just the beginning; that morning had more surprises in store.

When I arrived at the auditorium of the Pakistan National Library, the venue of the Conference, its auditorium was almost empty. It was nine o'clock; the inaugural session was to commence at ten. The staff of the President's Office had arrived and security checks were being performed. Though cars and coasters then started to bring the national and international participants to the auditorium, half an hour later the auditorium still had a very large number of empty seats. By then the Secretary to the President had arrived. He took me aside and said in a somber voice that it would look very bad if the President arrived to inaugurate the Conference and the auditorium was that empty. I explained to him that this was an academic gathering and, though we had sent out a thousand invitation cards, we did not expect a large crowd. This, however, was not convincing enough, as he insisted that we should have more people in the auditorium before the President arrived. Unable to get any further assistance from me for his cause, he directly approached the Coordinator-General of COMSTECH, who shared the same concern; both of them quickly joined hands to increase the session's audience.

During the next hour, as the foreign and national participants of the Conference waited for the inaugural session to commence, I was shocked to see the arrival of vehicles full of clerks, men who did errands for various government offices, and other miscellaneous staff of the nearby ministries. They had been instructed to put on their best clothes (God knows how they managed to find blazers and ties!) and fill the empty seats of the auditorium.

After an hour of hectic activity, the auditorium did give

the impression of being full, but most of the seats were occupied by people who had no understanding or interest in the subject of the Conference. This was, however, of no concern to the two men who had suddenly added a totally unexpected dimension to the Conference which, over the last few months, had become a focus of my hopes for future plans. Their deed done, the Secretary to the President and the Coordinator-General of COMSTECH exited the auditorium to receive the President as I exchanged greetings with Professor Nasr, who had just arrived.

The President entered the auditorium; Pakistan's national anthem was played; everyone rose to greet him as he took his seat on the stage along with the Coordinator-General. I then went to the microphone and invited Professor Nasr to the stage. The Conference began with the recitation of the verses from the Qur'ān. This was followed by the welcome address of the Coordinator-General. After this address, I invited Professor Nasr to deliver his keynote address, "The Islamic Worldview and Modern Science". After the greetings and introductory remarks, Professor Nasr read out his address.

This was the first time I heard him speak at a public event. The fluidity of his words, the images and ideas they carried, and the conviction in his voice combined to create a profound vision of Islamic thought and civilization. The audience was spellbound. Professor Nasr pinpointed various pitfalls in uncritically accepting modern science and technology. He called for the creation of an authentic Islamic science on the basis of traditional Islamic science. He said that while this new science could and might absorb those elements of modern science which did not go against the Islamic worldview, it would be a science from which the Hand of God had not been severed.

He concluded his address by stating that

> only a science that issues from the Source of all knowledge, from the Knower (*al-ʿĀlim*), and that is cultivated in an intellectual universe in which the spiritual and the ethical are not mere sub-

> jectivisms but are fundamental features of the cosmic, as well as of the Metacosmic Reality, can save humanity today from this mass suicide that parades as human progress. Let us hope that in these dark hours of human history, the Islamic world, as the bearer of the message of God's last revelation, can rise to the occasion to create a veritable Islamic science which would not only resuscitate this civilization, but also act as a major support for all those over the whole globe who seek a science of nature and a technology that could help men and women to live at peace with themselves, with the natural environment and above all, with that Divine Reality Who is the ontological Source of both man and the cosmos.[1]

Professor Nasr returned to his seat amidst applause that continued for several minutes.

When the President came to the podium to deliver his inaugural address, he surprised everyone by setting aside the text supplied to him by the host organization, as was customary in Pakistan. On this occasion, the President was so greatly influenced by what Professor Nasr had said that he began to speak extemporaneously. "You have spelled out a great vision," he said, looking at Professor Nasr, who was sitting on the stage,

> but I am afraid we need a different approach to modern science. We need to train a very large number of men and women in various branches of science. Our existence depends on this. Our students are being denied entrance to Western universities in key areas of science and technology, such as nuclear technology. We have already missed the Scientific and the Industrial Revolutions; if the Muslim world misses the current revolution of science, then we are doomed. We cannot afford that. We need to take bold and active steps to train our young scientists. We cannot afford to sit back and indulge in theoretical

1. See chapter seven for the full text of the keynote address.

discussions at this stage.

For the next forty-five minutes, the President expounded his views on the question of modern science. He used statistical data supplied to him by the Coordinator-General of COMSTECH to show his dismay at the lack of scientific research in the Muslim world. Muslim nations are endowed with vast resources, he said, but their combined scientific output is less than a single Western state. There has been not a single Muslim scientist who has won world acclaim in the last three hundred years, he lamented; the institutional structure for scientific research in the Muslim world is so undernourished that Muslims cannot hope to stand on their own, he lamented. He called for an unrestrained acquisition of modern science and technology and deemed it absolutely necessary for the survival of Muslim *Ummah*.

The next morning, almost all the newspapers ignored Professor Nasr's keynote address and the President's "call for science and technology" became the main headline. Apart from the news stories, two leading newspapers printed hostile columns criticizing views expressed by Professor Nasr. One of them labeled his position "looking backwards with longing". This was not unexpected, but what happened that evening was a surprise no one was expecting.

Peppering the already-circulated text of his public lecture, "Islamic Science: A Way Ahead", with extempore comments, Ziauddin Sardar delivered a scathing speech to a gathering that included Pakistan's scientific elite. Sardar punctuated his lecture with sarcastic remarks and open derision for the men in three-piece suits whom he compared to taxi drivers transporting passengers. This was unheard of in the class-conscious climate of Pakistan.

"There are no scientists in the Muslim world," he said,

> we only have technicians who are like taxi drivers, taking passengers from one place to another. These so-called scientists have all come back from the West with their technician's certification and are busy in carrying out second and third-rate research that has nothing to do with the

> needs of the Muslim world. None of them is actually pursuing science.[2]

Sardar's views were not unknown to certain participants, but the men who were heads of large and prestigious scientific organizations in Pakistan were not prepared for such a frontal attack. Sardar reduced their self-proclaimed lofty statures to naught:

> the idea of scientists as dedicated hermit-like lone researchers is now dangerously obsolete. Nowadays, science is an organized, institutionalized and industrialized venture. The days when individual scientists, working on their own, and often in their garden sheds, made original discoveries are really historic. Virtually all science today is big science requiring huge funding, large, sophisticated, and expensive equipment and hundreds of scientists working on minute problems. As such, science has become a unified system of research and application, with funding at one end of the spectrum and the end-product of science, often technology, at the other. In this system, it is not always possible for us to see where the so-called 'pure' science ends and technology begins.[3]

He argued that science can never be value free:

> Wherever we look in science, from its funding to its methodology, facts and laws to its control and management, we see values in action… By deliberately trying to hide its values under the carpet, by pretending to be neutral, by attempting to monopolize the notion of absolute truth, Western science has transformed itself into a dominant and dominating ideology. To believe,

2. Ziauddin Sardar, "Islamic Science: The Way Ahead", public lecture delivered at the International Conference on Science in Islamic Polity in the Twenty-First Century (March 26-30), 1995, 7. The original text of this lecture was published as a separate booklet by COMSTECH.

3. Ibid., 8.

> to pretend, to insist in the neutrality of science is to be a dupe and a victim of Western domination and control. To break free from the suffocating hold of Western scientific knowledge system, and to make science work for ourselves, we need to consciously strive towards shaping a science that is an embodiment of our norms and values. The function of the debate on a contemporary Islamic science is to explore how this can be done.[4]

He claimed that "the debate on meaning, nature, and characteristics of a contemporary Islamic science really started when [he] first published a cover story on science in the Muslim world in *Nature*,"[5] and then went on to describe the work of the host organization, COMSTECH, as being out of place in relation to ground realities. He alluded to an the 1983 Conference,[6] as well as the "Islamabad Declaration", adopted at the first meeting of COMSTECH,[7] and questioned the very idea of "Islamic polity":

> Within an Islamic polity—that is, an idealized 'Islamic state'—the principles and injunctions of Islam which are the basis of the state, it was argued, would automatically guide science in the direction of Islamic values…[but] we do not know really what constitutes a contemporary Islamic polity. The examples before us of states that claim to be 'Islamic' hardly provide us with confidence: Saudi Arabia, Iran, the Sudan and Pakistan. It seems that the label Islamic is being used here

4. Ibid., 30.
5. Ibid. For the cover story referred to in this claim, see Ziauddin Sardar, "A Revival for Islam, A Boost for Science?", *Nature* 282 (November 22, 1979), 354-357. Also see note 9 below.
6. "International Conference on Science in Islamic Polity" held in Islamabad on November 19-24, 1983.
7. This meeting was held in Islamabad in Rajab 27-30, 1403, corresponding to May 10-13, 1983. The "Islamabad Declaration" was appended to the brochure produced for the 1995 Conference.

> to justify authoritarianism, naked oppression, suppression of dissent and criticism and state violence against the people. How can science, any science, develop in such states? Moreover, apart from the fact that the emphasis on Islamic values in this perspective has remained largely at the level of rhetoric, science is still seen in similar terms to those of the Western paradigm as neutral and value free. Not surprisingly, much of the work done at the national and international level, within the framework of the Islamic Conference Standing Committee on Scientific and Technological Cooperation (COMSTECH), has been very conventional and concerned largely with nuclear physics, biotechnology and electronics. There is, for example, no real concern with building indigenous science, identifying areas of national concerns and needs, or changing the direction of science towards the principles of Islam or the societal needs of Muslims. Replacing 'nature' with Allah in science textbooks may provide psychological balm for our inferiority complex but it does not solve any real problems.[8]

The varying and conflicting ideas expressed by Seyyed Hossein Nasr, the President of Pakistan, and Ziauddin Sardar during the Islamabad Conference represent three distinct perspectives on the relationship between Islam, science, Muslims, and technology. At a deeper level, however, these views are indicative of three different visions of Islamic thought and civilization and their future.

II

The views expressed by Seyyed Hossein Nasr that March morning were the result of many years of reflection[9] on the

8. Sardar, "Islamic Science: The Way Ahead", 38.

9. "Since my early twenties, I have been concerned first of all with the question of modern science, its history and philosophy, secondly with the traditional sciences at the heart of which is to be found the sacred sciences, and finally with the differences and contrasts between the two types of sci-

nature of modern science and technology and their impact on Islamic polity. They stemmed from a religious view of the cosmos, a view which

> includes not only a metaphysics dealing with the nature of the Supreme Reality or Source, but also cosmological sciences which see all that exists in the cosmos as manifestations of that Source, the cosmological sciences themselves being applications of metaphysical principles to the cosmic domain. The religious view of the cosmos relates not only the beginning and end of things in the external sense to God, but also studies all phenomena as signs and symbols of higher levels of reality leading finally to the Supreme Reality and all causes as being related ultimately to the Supreme Cause.[10]

Seen from this perspective, the experimental sciences are considered a subset of those sciences which deal with the knowledge of this world. These sciences are arranged within a hierarchy—a hierarchy "that exists objectively and inde-

---

ence mentioned, namely the traditional and the modern. Questions dealing with these matters have occupied my attention ever since and a major part of my intellectual life, both in the form of teaching and writing, has been devoted to matters revolving around traditional and modern sciences as well as to the challenges which the modern sciences pose for the religious view of reality in general and the Islamic in particular." Lewis Edwin Hahn, Randall E. Auxier, and Lucian W. Stone, Jr. (eds.), *The Philosophy of Seyyed Hossein Nasr* (Chicago: Open Court, 2001), 463. Nasr's first articles on Islamic science were published in the late 1950s, and since then there has been a steady flow of articles and books on this subject. His *Introduction to Islamic Cosmological Doctrines* was published in 1964, *Science and Civilization in Islam* in 1968, and *Islamic Science—An Illustrated Study* in 1976; see bibliography in *The Philosophy of Seyyed Hossein Nasr* for other works.

10. Ibrahim Kalin, "The Sacred Versus the Secular: Nasr on Science" in *The Philosophy of Seyyed Hossein Nasr*, op. cit., 463-4.

pendently of the knowing subject", as Ibrahim Kalin has succinctly pointed out.[11] Moreover, it is only through placing experimental sciences within this hierarchy that one can avoid the reductionistic empiricism that is the most basic feature of modern science.

Nasr's position is further augmented by his assertion that the enterprise of science in Islamic civilization before the rise of modern science was, in fact, deeply rooted in the religious view of nature. The most important element of this religious view was *tawḥīd*, the principle of unity that stands functions as a vertical axis for all things Islamic. *Say, Allah is One*, the shortest *Sūrah* of the Qurʾān proclaims unambiguously.[12] This uniting principle runs through the entire fabric of Islamic civilization, as Nasr repeatedly states, and, as such, the study of nature as cultivated in Islamic civilization stemmed from the ontological and metaphysical principles of Islam. This integral and inalienable link between the philosophy of nature and the experimental sciences, on the one hand, and the cardinal principle of Islam, *al-Tawḥīd* (Unicity of God), on the other, forms the foundation of science in Islamic civilization. Modern science broke this link between the Creator and the created world, and, thus, one of the distinct elements of Nasr's writings on science has been a critique of modern science uncovering numerous levels of degradation caused by this foundational break with traditional science:

> Five main traits of modern science come to the fore in Nasr's critical analysis. The first is the secular view of the universe that sees no traces of the Divine in the natural order... The second feature is the mechanization of the world-picture upon the model of machines and clocks. Once couched in terms of mechanistic relations, nature becomes something absolutely determinable and predictable—a much needed safety zone for the rise of modern industrial society and capital-

11. Ibid., 450.
12. *al-Ikhlāṣ*: 1.

> ism. The third aspect of modern science is rationalism and empiricism… The fourth trait is the legacy of Cartesian dualism that presupposes a complete separation between *res cogitans* and *res extensa*, that is, between the knowing subject and the object to be known. With this cleavage, the epistemological alienation of man from nature comes to completion by leaving behind a torrent of pseudo-problems in modern philosophy, the notorious mind-body problem being a special case in point.
>
> The last important aspect of modern science is in a sense a culmination of the foregoing features, and it is the exploitation of nature as a source of power and domination—a fact not unknown to modern capitalist society.[13]

Over the course of last few decades, Nasr's position has attracted numerous scholars in various parts of the world. These scholars have explored many new facets of Islam and science discourse from the perspective originally outlined by Nasr.[14]

III

On that March morning the President of Pakistan had, in fact, re-articulated what has been the position of numerous Muslim reformers since the early nineteenth century. What these reformers saw in modern science was a magical segue to power and empowerment. These reformers viewed the disparity in economic, political, and military power of the Muslim and the Western worlds as a result of the latter's achievements in science and technology. When they first realized the enormous gap between the Muslim world and the West, the balance of power had already shifted in favor of the Western world, and their armies were knocking at the

13. Kalin, "The Sacred Versus the Secular: Nasr on Science", op. cit., 453.
14. See "Suggested Readings" for some of these works.

doorsteps of the three Muslim empires which governed the traditional lands of Islam at that time: the Ottomans, the Safavids, and the Mughals. These empires were all slow in realizing the nature and extent of the changes in economic, political, and military power which took place during the seventeenth and the eighteenth centuries. When they did realize this shift, they were already fighting a lost battle. Soon almost the entire Muslim world was either directly or indirectly colonized by the Western powers.

These reformers understood this transformation to have taken place due to the advantages gained by the Western world through its scientific and technological discoveries. They then sought to awaken the Muslim world to its predicament by passionately advocating the acquisition of modern science. They legitimized their call by equating modern science with knowledge (*al-ʿilm*) and then invoking the Qurʾānic and the Prophetic insistences on the acquisition of knowledge. Since acquisition of knowledge was a religious obligation (*farḍ*) for believers, they argued, Muslims must acquire science wherever they find it. They often used a weakly authenticated saying of the Prophet in which believers are advised to "acquire knowledge even if it be found in China", along with host of other sayings, to establish their case.

Over the course of two centuries, this reformers' discourse on Islam and modern science was refined and expanded by the addition of religious exhortations as well as statistical and historical data. The names of certain Muslim scientists were often invoked to exhort Muslims to follow their glorious tradition. In the past, men such as al-Bīrūnī and Ibn Sīnā were the greatest scientists in the world, it was argued; why can we no longer produce scientists of the same caliber? In more recent years, it had become fashionable to use the work of certain Western historians of science to reclaim the past glory and to substantiate the claim of greatness of Islamic scientific tradition on the authority of a George Sarton or an Edward Kennedy; this then led to rhetoric questions: Why not now? What has gone wrong?

Why can Muslims not produce science now? Such arguments often ended with apocalyptic warnings: unless we awaken to meet the challenges of the new century, we are doomed.

The reformers' discourse was successfully transferred to the rulers of some fifty-five Muslim nation-states which emerged in traditional Muslim lands in the wake of World War II, and it thus achieved a more or less official status. These nation-states, carved for the most part out of the former colonies of the West, enjoyed a limited independence, but in almost all cases this independence merely meant the replacement of the former rulers with natives who had been bred in the educational, cultural, and social milieu created by the colonizers. During the era of colonization, most of the traditional institutional structures of the Muslim world had been destroyed. Most of the endowed properties (*awqāf*), which were the lifeline of the traditional system of education and scientific research in the traditional Islamic lands, had been confiscated by the colonizers and the Islamic educational system—which once produced some of the greatest men and women of learning humanity has ever known—was replaced with a new system designed to produce low-ranking clerks for the new bureaucratic systems established in the colonies and also to some extent in Persia and the Ottoman empire, which were not directly colonized by the West. As a result, only a few islands of Islamic learning survived, notably those in Iran.

These new Muslim states emerged on the ruins of a tradition that had been subjected to massive destruction during the preceding two centuries. Created on the basis of national identities, some of which were forged for the first time in history by the colonizers, most of these states were ruled by autocratic rulers; their political, judicial, social, and educational institutions were built upon the models left behind by the colonizers, and almost all of them had an educated elite which was intellectually closer to the departing rulers rather than their own forefathers. It was this educated elite, bred in the institutions established by the colonizers or directly in the West, that led the so-called independence movements in

the Muslim world and then became its ruling class.

Most of these men and women often saw little worthy of appreciation in the Islamic tradition. Their education, upbringing, and professional training had severed or weakened their links to the Islamic spiritual and intellectual currents that had nurtured their forebearers. They did have a nostalgic longing for an imagined past glory, but no desire to recreate the spiritual, intellectual, and social milieu which had once produced scientists and scholars of the highest caliber. Instead of rediscovering and reestablishing links with their own spiritual and intellectual tradition, these men and women craved to enact the social, economic, and intellectual models they saw in the Western world. For them, Western science and technology were the crown of human learning. For them, the answer to all ills suffered by Muslims was science and more science.

In the post-independence era, this call for "more and more science" has been couched in religious, nationalistic, and moral terms. Some of these arguments were borrowed from reformers of the previous two centuries; others were new. Among the most frequently employed religious arguments was that which equated modern science with knowledge *par excellence* and made it a religious obligation, as explicated above.

Those who used nationalistic and moral justifications to urge Muslims to acquire modern science often did so by using necessity and practicality as their basic argument. The state cannot survive without modern science and technology, they argued. It needs to defend itself. It needs to produce enough food for its populace, and it needs a modern medical system. All of these require highly trained scientists. We must, therefore, acquire as much science as possible.

Perhaps one of the most representative example of this strand is Mustafa Kemal (1881-1938), the founder of modern Turkey, whose numerous speeches and statements on the subject spell out, in clear terms, what modern science means to the proponents of this view. His self-righteousness, his conviction in what he believed, and the savagery with

which he put into practice his lethal policies have seldom been matched elsewhere in the Muslim world, but his views have been knowing or unknowingly repeated by numerous political leaders of the Muslim world over the course of the twentieth century. The following, from among his most repeated statements, provides insight into his beliefs:

> We shall take science and knowledge from wherever they may be, and put them in the mind of every member of the nation. For science and for knowledge, there are no restrictions and no conditions. For a nation that insists on preserving a host of traditions and beliefs that rest on no logical proof, progress is difficult, perhaps even impossible.[15]

Religious, nationalistic, and moralistic exhortations were often combined to emphasize the importance and necessity of acquiring modern science. Since the Ottomans were the first among Muslim states of that time to directly encounter modern Western science and its products, their formulations became a model for many other nation-states. In general, all advocates of modern science premised their arguments on the basis of utility of science, and they all assumed that once enough science has been acquired, all problems of the Muslim countries would be solved and they would be at par with the Western world.

> At the level of practical needs, modern science was seen as the *sine qua non* of the advancement and defense of Muslim countries in the field of military technology. The Ottoman political body, which unlike the other parts of the Islamic world was in direct contact with European powers, was convinced that its political and military decline was due to the lack of proper defense mechanisms against the European armies. To fill this

15. Quoted by Ibrahim Kalin in "Three Views of Science in the Islamic World" in Ted Peters, Muzaffar Iqbal, and Syed Nomanul Haq (eds.), *God, Life, and the Cosmos: Christian and Islamic Perspectives* (Aldershot: Ashgate, 2002), 44.

> gap, a number of massive reforms were introduced by Maḥmūd II with the hope of stopping the rapid decline of the Empire, and a new class of military officers and bureaucrats, who became the first point of contact between the traditional world of Islam and the modern secular West, was created. A similar project, in fact a more successful one, was introduced in Egypt by Muhammad Ali whose aspirations were later given a new voice by Ṭāhā Ḥussain and his generation. The leitmotif of this period was that of extreme practicality: the Muslim world needed power, especially military power, to stand back on its feet and new technologies powered by modern science were the only way to have it.[16]

IV

The views expressed by Ziauddin Sardar first appeared in the discourse on Islam and modern science in the early 1980s. They were shared by a small group of loosely associated writers who called themselves "*Ijmālīs*". Over the course of the next two decades, Sardar and other members of this group produced a small body of work that viewed modern science as a problem-solving tool. Sardar was the most articulate in this group. He forcefully stated that all knowledge, including natural sciences, is socially constructed and is instrumental. In his major work on the subject, *Explorations in Islamic Science*, Sardar clearly stated his main assumptions:

> [The] 'purpose' of science is not to discover some great objective truth; indeed, reality, whatever it may be and however one perceives it, is too complex, too interwoven, too multidimensional to be discovered as a single truth. The purpose of science, apart from advancing knowledge within ethical bounds, is to solve problems and relieve misery and hardship and improve the physical, material, cultural and spiritual lot of mankind. The altruistic pursuit of pure knowledge for the

16. Ibid., 43.

> sake of 'truth' is a con-trick. An associated assumption is that modern science is distinctively Western. All over the globe all significant science is Western in style and method, whatever the pigmentation or language of the scientist.
>
> My second assumption follows from this: Western science is only a science of nature and not *the* science. It is a science making certain assumptions about reality, man, the man-nature relationship, the universe, time, space and so on. It is an embodiment of Western ethos and has its foundation in Western intellectual culture.[17]

By situating science within the social realm and by insisting on its utilitarian aspect, Sardar reduced all aspects of philosophy of science to sociology of science and produced a stringent critique of modern science. Since Sardar and others in the *Ijmālī* group construe science as a cultural enterprise, they argue that each civilization must produce its own specific kind of science, dealing with its own specific problems and within its own worldview. Their reductive sociological approach, however, excludes ontological and metaphysical considerations from the discourse. They build an epistemology of science without any philosophy and ontology.

Sardar claimed that

> The Ijmali position is similar to that of al-Ghazzali. The propagandists for science, just like the propagandists for Greek philosophers, have attributed to science things which are beyond its abilities and scope. While we do not, indeed cannot, deny the solid achievements of modern science, we emphasize the "repulsive façade" of its

17. Ziauddin Sardar, *Explorations in Islamic Science* (London:Mansell Publishing Ltd., 1989), 6; also see his *Islamic Futures* (London: Mansell Publishing Ltd., 1985) and his (ed.), *The Touch of Midas: Science, Values and the Environment in Islam and the West* (Manchester: University of Manchester, 1984).

> metaphysical trappings, the arrogance and violence inherent in its methodology, and the ideology of domination and control which has become its hallmark.[18]

Sardar and his group have often been excessively harsh against Nasr and others who base their position on metaphysical considerations. They have also written against those who attempt to find modern science in the Qurʾān (often referring to it as "Bucaillism"). Sardar and others associated with the *Ijmālī* group emerged on the scene of Islam and science discourse like a western wind that blows hot and cold in successive waves and disappeared from the scene as quickly as it came, leaving behind a position in which "one can hardly fail to see the subtext…based on Kuhn, Feyerabend, and others…Sardar's definition of science shares much of the instrumentalist and anti-realist spirit of the Kuhnian definition of science".[19]

Sardar, however, rejects this criticism:

> it would be wrong to assume from this that the Ijmalis are simply Kuhnian; we neither sanction the extreme relativism of Kuhn, nor the anarchistic epistemology of Feyerabend; neither do we support the class-based science of radical Marxists, or a science based on "evolutionary epistemologies" of the new schools—we do, however, appreciate the positive contribution of each and learn from their expositions, just as we have learned from the positivist interpretation of science. But we do, even though we have only just begun, have a unique position of our own which is derived solely from the ethical, value and conceptual parameters of Islam. The essence of Ijmali thought is *reconstruction*, *complexity* and *interconnection*, or what Riaz Kirmani has called complementarity.[20]

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18. Sardar, *Explorations in Islamic Science*, 155.
19. Kalin, "Three Views of Science in the Islamic World", op. cit., 61.
20. Ibid. Emphasis is in the original text.

The *Ijmālī* position seemed quite important during the few years of its initial prominence, but it did not take roots in the discourse on Islam and science. Its proponents were freelance writers who did not have the interest or intellectual and spiritual resources to sustain their discourse; they soon moved on to other subjects or simply disappeared from the intellectual scene.[21]

V

Within one year of the International Conference on Science in Islamic Polity in the Twenty-First Century, everything disintegrated—the hopes and possibilities of a new and vigorous revival of the Islam and science discourse that I had envisioned as the outcome of the Conference proved to be futile. The Coordinator-General of COMSTECH was so shaken by the President's negative attitude toward the central focus of the Conference that he feared for his job. One of the goals of the Conference was to bring together scholars and scientists to establish cooperative groups in order to critically analyze the role of modern science and technology in the Muslim world. However, the negative press coverage of Professor Nasr's views, the reverberations resulting from the frontal attacks between the country's scientific elite and Ziauddin Sardar, and numerous other factors made it im-

21. For a representative sampling of the work of two other members of this group, Pervez S. Manzoor and Munawwar Anees, see M. A. Anees, "Islamic Science—an antidote to reductionism" in *Afkar/Inquiry*, 1 (1984) 2, 49; "Laying the foundations of Islamic science" in *Inquiry*, 2 (1985) 11, 36-43; "What Islamic science is not" in *J. Islamic Sc.* 2 (1986) 1, 9-20; and "Islamic Values and Western Science: a case study of reproductive biology" in Sardar, Ziauddin (ed., 1984), *Touch of Midas,* op. cit. Although the *Journal of Islamic Science*, which originally published many writings of this group, still makes an irregular appearance and the two organizations in India, the Muslim Association for the Advancement of Science and Centre for Studies on Science, are still somewhat active, their contribution to the discourse has been marginal.

possible to realize the goals of the Conference.

In July 1996, a new Coordinator-General was appointed by the President. One of the first things the new executive head of COMSTECH did was to close down the journal, *Islamic Thought and Scientific Creativity*, which had just started to attract serious scholars. He was a chemist who stated that all issues dealing with the relationship between Islam and science are *dīnyāt*.[22] Such an attitude was perhaps inevitable, given the deep-seated scientism that has spread throughout the Muslim world.

I resigned from COMSTECH in August 1996 and moved back to Canada in 1999. In 2000, a small-scale effort was made by a group of scholars to renew the discourse on Islam and science through the establishment of Center for Islam and Science (CIS). In 2003, CIS launched *Islam & Science*,[23] a semi-annual journal that explores, from Islamic perspectives, philosophical and religious implications of data that originates in the physical, biological, and social sciences. *Islam & Science* also publishes articles that enhance our understanding of the Islamic intellectual tradition with special emphasis on the Islamic scientific tradition. Thus the sudden death-knell served to the hopes and aspirations of further exploring the relationship between Islam, Muslims, science, and technology was thwarted. Professor Nasr was one of the first scholars to intellectually support the Center for Islam and Science as well as its Journal, and this continues to this day.

VI

Perceptive readers of this book will discover that the discourse on Islam, science, Muslims, and technology—which this book presents from various angles—is not merely *dīnyāt*,

22. An Urdu word used to denominate subjects related to religion (*Dīn*). What he actually meant by this categorization was that these issues are of no practical value, for practical value could only be attached to science that produces scientific papers or solves problems.

23. For more details, see *www.cis-ca.org/journal*.

if this word is to be used in the aforementioned sense; this discourse concerns the very existence of Islamic civilization as it has been known over the last fourteen hundred years. The sheer reach of modern science and technology, their essential role in structuring and dictating lifestyles, habits, and human relations, their insidious ways of affecting traditional cultures, their destructive impact on nature, and their ability to transform and reshape societies are rapidly destroying the fabric of traditional societies everywhere in the world. Muslims no longer live in a world protected from the ravages of modern technology; in fact, the Muslim world is at the forefront of accepting all forms of modern technology along with everything else that comes from the modern West, especially if it is presented in the name of a science. As a result, traditional methods of cultivation are being abandoned; genetically modified crops are replacing indigenous varieties; places which were considered immune to outside influences even a decade ago have been ushered into the modern era with a great deal of violence to traditional lifestyles.

Muslim attitudes toward modern technology have been reversed over the course of two centuries; the reformers' discourse on modern science and technology has apparently won over the hearts and minds of most Muslims. The initial resistance to modern technology has given way to such a large-scale and uncritical acceptance and use of modern technology that no area of public and private life has remained immune from a massive influx of technologies which have altered the very fabric of Muslim societies. The result of this change is obvious all over the Muslim world.

> The appearance of supersonic jets, cellular telephones, and a vast network of freeways within one generation has not only destroyed traditional patterns of life in these countries, it has also given birth to numerous cultural, social and environmental problems which are multiplying at a dangerous rate. Signs of collapse of traditional societies are apparent throughout the Muslim

> world, especially in countries where modern science and technology has made inroads.[24]

Of course, modern technologies do not come alone; they bring with them lifestyles, particular modes of relating to others as well as to the natural world. There is also the inevitable large-scale devastation of the natural environment. In short, the massive influx of modern technologies in Muslim societies have rapidly changed the way Muslims now live in most parts of the Muslim world. These new lifestyles are largely dependent on modern technologies which are often imported without any concern about their impact on the spiritual, cultural, and social life of the community.

In most of the Muslim world, political leadership has so aggressively imported modern technologies during the last twenty years that these societies have witnessed dramatic changes in their composition—from the way they produce food to transportation and modes of communication. This vast transformation is, however, merely an outward sign of an inner transformation that is directly linked to the role of technologies in the destruction of spiritual life, though this link is seldom recognized by most people using these technologies.

There are definite direct as well as indirect ways in which the Muslim encounter with modernity has been greatly affected by modern science and technologies. These range from the devastation caused by the loss of traditional ways of rural life to the emergence of large, overcrowded, polluted, and unmanageable cities. It shows itself in the incongruous buildup of modern weapons in countries where most of the population remains in a perpetual state of poverty because the small ruling elite, which does not tire of lecturing its populace on merits of acquisition of science and technology, plunders national resources in the name of buying security through the build-up of arms.

The invasion of modern technology in the Muslim world

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24. Muzaffar Iqbal, *Islam and Science* (Aldershot: Ashgate, 2002), 303.

has not only destroyed traditional lifestyles, it has also obliterated that enchanting "Islamic space" which once filled the ancient places of worship, homes, shrines, and *madāris*; this rude intrusion is nowhere so painful as in the Sacred Mosque, where many pilgrims now arrive with their cellular phones to relay a running commentary on their rounds around the Kaʿbah.

Other manifestations of the deep-seated inferiority complex in the Muslim mind toward modern science and technology are expressed in the incessant desire to prove the Divine origin of the Qurʾān through modern science, the shallow support certain Muslim writers find in the Qurʾān for Darwinism, the often hidden belief in progress and scientific materialism, the nostalgic and ineffective remembrance of the past glories of Muslim scientists and scholars.

Islam, Science, Muslims, and Technology is borne out of this context. The four conversations which appear in this book were published in *Islam & Science* between 2003 and 2007, but have been thoroughly revised for the book. The book deals with some of the theoretical issues at the heart of Islam and science discourse; its main concern, however, is with the transformation of Muslim societies through the impact of modern science and technology.

2

The Question of Cosmogenesis—the Cosmos as a Subject of Scientific Study

The study of the cosmos involves the question of its origin, and there is no school of the philosophy of science—whether ancient or modern, Eastern or Western—that has not dealt in one way or another, explicitly or implicitly, with this problem. Islam and the sciences cultivated in its bosom are no exception. In fact, the Noble Qur'ān insists over and over upon the ultimate significance of the question of the genesis of the cosmos for the religious life itself, and directs all veritable Islamic thought to concern itself, after the study of the Divine Principle, first of all with the question of the origin of the world and of man before turning to the possibility and manners of the study of cosmology and anthropology. Moreover, Islamic thought, basing itself on the Qur'ān, has always considered the question of cosmogenesis to be religious and metaphysical, the answer to which comes from the truth of revelation and not simply from an extension and extrapolation of the sciences of the natural and physical order. The Islamic attitude to this question stands therefore at the antipode of the modern Western scientific view, which considers cosmology and cosmogenesis simply as extensions of physics, astrophysics, and other branches of the natural sciences.

Islam insists that the cosmos, no matter how quantita-

tively vast, is but a speck of dust before the Divine Reality which alone is absolute and infinite. All that is *mā siwaʾLlāh* (that is, other than Allah) is as nothing before the Majesty of the Divine.

Moreover, within the created order itself, the archangelic and angelic worlds are of such immensity that the visible and physical world pales into insignificance before them. This is the implication of many *aḥādīth* concerning the angels, such as that concerning the Angel of Death whom God has veiled with a million veils and who is more immense than all the heavens and the two earths (that is, East and West).[1]

The physical part of the cosmos that is the subject of study of natural sciences has a beginning and an end. It is the lowest level of reality which is encompassed, metaphorically speaking, by worlds immensely greater than it. And all of these worlds are in turn but as a dust-mote before the Divine Throne.

The Qurʾān affirms over and again that the world was created and did not come into being by itself.[2] It insists on

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1. According to a *ḥadīth*, "When Allāh created the Angel of death, He veiled him before creatures with a million veils. His immensity is vaster than the two earths (East and West), and the eastern and western countries here below in the territorial world are between his hands like a dish on which all things have been set". Frithjof Schuon, *Dimensions of Islam*, trans. by P. Townsend (London: George Allen and Unwin, 1970), 116. Some *aḥādīth* refer to angels in general as light. The well-known *ḥadīth* upon which al-Ghazālī commented in his *Mishkāt al-anwār* and which contains a whole cosmology is as follows: "God has seventy veils of light and darkness; were He to lift them, the august glories of His face would burn up everyone whose eyesight perceived Him". See David Buckman, trans. and ed., Al-Ghazālī, *The Niche of Lights* (Provo: Brigham University Press, 1998), 1.
2. The various Divine Names referring to the creative power of God are sufficient to indicate the Qurʾānic insistence upon the created nature of the world.

the ontological dependence of the world upon God and the fact that all the coherence, regularity, and harmony of the natural order is a result of the nature of the Creator and His Wisdom, which is reflected in His creation. The Qurʾān repeats in many verses that God is the Creator (*al-Khāliq*) of the world. *Recite, in the Name of thy Lord who created*[3]; *Your Lord is Allah, who created the heavens and the earth in six days.*[4] He is also creator in the sense of *al-Fāṭir. Lo! I have turned my face toward Him who created the heavens and the earth*[5]; and *Your Lord is the Lord of the Heavens and the earth, Who created them*.[6]

Man in fact addresses God as *O Thou Creator* (*al-Fāṭir*) *of the heavens and the earth!*[7] Moreover, the Qurʾān emphasizes that God created not only the heavens and the earth but everything within them. *We created the heavens and the earth and what is between them*.[8] There is also an insistence that the duality of the masculine and feminine observed in all of creation in one form or another is the result of God's creation and not the consequence of some cosmic or biological process, for *We have created you male and female*.[9] There is also more general reference in the Qurʾān to God's creation of pairs.[10]

Not only is God the Creator, but He is the *only* Power who can create. He created the world through His Will: He said "Be" (*kun*), and there was.[11] The Divine Word is the origin of the entire created order. Moreover, within this order God creates what He Wills, as is repeated so often in the Qurʾān.[12] And it is He who bestows upon things their nature

3. *al-ʿAlaq*: 1.
4. *Yūnus*: 31.
5. *al-Anʿām*: 80.
6. *al-Anbiyāʾ*: 56.
7. *Yūsuf*: 101.
8. *Qāf*: 39.
9. *al-Ḥujurāt*: 13.
10. *al-Zukhruf*: 12.
11. *Yā Sīn*: 82.
12. See for example *al-Naḥl*: 20, 40, 48; *al-Anbiyāʾ*: 117. This

and the laws and order that govern them: *Our Lord is He who gave everything its nature, then guided it aright*.[13]

Being the origin of the world, God is also its end, and creation returns to Him. *God originates creation, then brings it back again*;[14] *The Day when We shall roll up the heavens, as a recorder rolleth up a written scroll—and We began the first creation. We shall bring it back again*.[15] He can also destroy the world and create a new one, for *hast thou not seen that Allah created the heavens and the earth with truth? If He Wills, He can remove you and bring (in) some new creation*.[16]

As the Creator, God established laws and order that man cannot alter, for *there is no altering the laws of God's creation*[17]; and although He has given man the possibility of knowing the cosmos, it is only God who knows all creation[18] and has knowledge of everything in the universe, from the movement of the stars to that of an ant within its hole. The Islamic cosmos comes from God, is governed by Him, and returns to Him. It is not an autonomous and independent reality with an unknown or simply material beginning and end. Nor are its laws developed by chance or by its own inner workings, nor are the changes and transformations taking place within it solely dependent upon its own forces and energies. Creative power always belongs to the Creator, not the created order, although that power has manifested itself in countless ways in the cosmos throughout its long history and God has acted through various agencies.

Different schools of Islamic thought, basing themselves on the terminology of the Qurʾān and *Ḥadīth,* have devel-

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doctrine is of the utmost importance for understanding of the Islamic conception of nature and its relation to its Creator.

13. *Ṭā Hā*: 50.
14. *Yūnus*: 35.
15. *al-Ḥajj*: 104. See also *Āl-ʿImrān*: 47; *al-Nūr*: 45; *al-Shuʿarāʾ*: 49, 68; and *al-Rūm*: 54.
16. *Ibrāhīm*: 19 and *al-Fāṭir*: 16.
17. *al-Rūm*: 30.
18. *Yā Sīn*: 79.

oped a rich technical vocabulary concerning creation in order to bring out different meanings of this term. Later Qurʾānic commentators and Muslim thinkers have distinguished between *khalq, fiṭr, ṣunᶜ, ibdāᶜ,* and *ḥudūth*, each of which possesses an exact meaning in various schools of commentary (*tafsīr*), theology, Sufism, and philosophy. The Qurʾān itself refers to these terms in one form or another as well as to the creative function of God as the producer (*al-Bārīʾ*) and as the Form-giver (*al-Muṣawwir*), as in the verse, *He is God, the Creator* (*al-Khāliq*), *the Producer* (*al-Bārīʾ*), *and the Form-giver* (*al-Muṣawwir*).[19] The diversified terminology of the Qurʾān has caused numerous debates over the centuries concerning the meaning of creation. The main issue emphasized by Islamic thinkers, which is also of importance to the present discussion, concerns creation from nothing (*ex nihilo, min al-ᶜadam*) on the one hand, and from a previously unformed matter on the other—as well as the *meaning* of this "nothing".

These questions, that have been discussed and ana-

19. *al-Ḥashr*: 24. See also *al-Rūm*: 11 and 27. There is in fact a hierarchy in such Divine Names as *al-Khāliq*, *al-Bārīʾ*, and *al-Muṣawwir*, as seen in the order in which they are mentioned in the Qurʾānic verse *al-Ḥashr*: 24. *Khāliq* refers to God's Power to conceive the realities of creation in the Divine Intellect. As *al-Bārīʾ*, He gives these realities existence and produces them. Then, as *al-Muṣawwir,* He gives them form. See Titus Burckhardt, *An Introduction to Sufi Doctrine*, trans. by D. M. Matheson, (Wellingborough: Thorsons, 1976), 58-59. See also S. H. Nasr, *An Introduction to Islamic Cosmological Doctrines* (Albany: State University of New York Press, 1993), 212-213; also Thomas J. O'Shaughnessy, *Creation and the Teachings of the Qur'ān* (Rome: Biblical Institute Press, 1985); David Burrell, *Freedom and Creation in Three Traditions* (Notre Dame: Notre Dame University Press, 1993); and David Burrell and Bernard McGinn (eds.), *God and Creation: An Ecumenical Symposium* (Notre Dame: Notre Dame University Press, 1990). These works contain various in depth studies on the idea of creation in Islamic thought.

lyzed since the first Islamic century, are, properly speaking, the concern of theology and metaphysics but they are also important for the philosophy of science. The importance of the subject and the very extensive debates carried out about it in various schools of Islamic thought must therefore be mentioned, if only briefly. On the one hand, the Qurʾān asserts that God said 'Be', and there was—the famous *kun fayakūn*.[20] This has usually been interpreted as meaning creation from nothing, although creation itself implies God's knowledge of His creation and hence the "presence" of the world in Divine Knowledge before its external creation. On the other hand, there are *aḥādīth* and sayings of some Companions such as ʿAlī ibn Abī Ṭālib referring to the creation of the world from "dust" or "clouds" (*al-habāʾ*), a Qurʾānic term that must be understood symbolically.[21]

Let us turn to the question of God's Name as the Creator (*al-Khāliq*). If the world were created at a particular moment before which it did not exist, then either God was not *al-Khāliq* before that moment, which would imply a change in Divine Nature, a thesis that Islam could not accept, or one would have to accept that since God is *al-Khāliq*, He must have always created and therefore there must have always been a creation, *a* world if not *this* world. Furthermore, time is itself a feature of the created order. Therefore, there could not be a time before creation and creation could not have a beginning in time. This is the essential argument of Islamic philosophers against the theologians (*mutakallimūn*) concerning the creation of the world.

Muslims seeking to avoid all danger of attributing any

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20. *Yā Sīn*: 82.

21. Many later thinkers identified the Qurʾānic term *habāʾ* with the *hayūlā* (*hylé*) of the philosophers, while certain Sufis identified it with the pre-existence of things in Divine Knowledge before their creation. See William Chittick, *The Sufi Path of Knowledge* (Albany: State University of New York Press, 1989), 38. See also his *The Self-Disclosure of God* (Albany: State University of New York Press, 1998), xxix.

Divine Qualities (such as eternity) to the world sought to answer these questions in such a way as to preserve the status of the Creator as the source of all reality and creative power. Following the clear message of the Qurʾān, they identified the power of creation with the Divinity and therefore insisted that since only God possesses Divinity in the ultimate sense, only He can be the creator, most of all in the sense of bestowing existence. All creative power must belong to Him and originate from Him, as emphasized by the whole tradition of Qurʾānic commentators from al-Ṭabarī to Fakhr al-Dīn al-Rāzī, from al-Ṭabarsī to Ibn al-Jawzī. The greatest Muslim thinkers such as al-Fārābī, al-Ashʿarī, Ibn Sīnā, al-Ghazālī, Fakhr al-Dīn Rāzī, Ibn Rushd, Ibn ʿArabī, and in more recent centuries Ṣadr al-Dīn Shīrāzī and Shāh Walī Allāh Dihlawī devoted much of their writings to this problem, which came to be known classically as *al-ḥudūth waʾl-qidam*.[22]

The debates between various schools of Islamic thought cannot be repeated or summarized here. But what is significant for the Islamic philosophy of science is that all schools of Islamic thought, basing themselves upon the Qurʾān and *Ḥadīth*, agree that only God creates and that creative power belongs, ultimately, to God alone. They also agree that God has knowledge of all things and that nothing occurs in the world without His Knowledge. Even those who accept that the world is *qadīm*, that is, having no origin in time, do not consider the eternal "world" to mean the whole created order as such, for the created order comes into being and passes away all the time according to God's Knowledge and Will; but they mean matter (*al-māddah* or *hayūlā*) which is the same as the Scholastic *materia prima* in the sense of that which has no origin in time but is also pure receptivity, not

22. Much of the famous attack of al-Ghazālī against the philosophers in his *Tahāfut al-falāsifah* and Ibn Rushd's rebuttal in his *Tahāfut al-tahāfut* deal with this issue. See Averroes, *Tahāfut al-tahāfut (Incoherence of the Incoherence)*, trans. with notes by Simon van den Bergh (London: Luzac & Co., 1954).

actuality, and therefore not to be confused with matter in the modern scientific sense of the term. Like other Muslim thinkers, such thinkers consider what we call the world to be ontologically dependent upon God, without Whom it would have no existence whatsoever.

There are no traditional Islamic schools of thought which would consider the world to be an order of reality independent of God. The Islamic philosophy of science is totally opposed not only to the atheistic view, which denies God and considers the universe as the only reality, but also to the deistic position, according to which God is only the originator of the universe in the sense of a mason who builds a house and has no relation with it afterwards—so that his death or passing would not at all affect the existence of the house. In the Islamic perspective, the whole universe is ontologically dependent upon God at all moments, not only at the beginning. Without God's Word *kun* being operative here and now, the whole universe would collapse and be literally nothing. It would cease to exist. There is a teaching developed by a number of Sufis according to which the universe is annihilated and recreated at every moment, so that its ontological dependence upon God holds for every moment of its existence.[23]

God has not only created the world but sustains and in reality re-creates it at every instant, not only through His Knowledge but also through His Will, which is associated with the command form of the verb "to be" (*kun*). As already mentioned, God said "Be", and there was. The whole universe, this world and the next, were brought into being by these two letters, *k* and *n*. As the Persian Sufi poet Maḥmūd Shabistarī says in praising God, "From *k* and *n* He brought forth the two worlds of being (*kawnayn*)".[24]

The Word by which all things were made is known in

23. See William Chittick, *The Self-Disclosure of God*, 57ff.; also Toshiko Izutsu, *Creation and the Timeless Order of Things* (Ashland: White Cloud Press, 1994).

24. *Zikāfu nūn padīd āward kawnayn*.

Islamic sources as *al-Kalimah*, which is also a name of the Qurʾān that in a sense is the complement and in another the prototype of creation itself.[25] Certain *aḥādīth* refer to the *Kalimah* as the first being created by God (*awwalu mā khalaqaʾLlāh*), while others refer to the Pen (*al-Qalam*), Light (*al-Nūr*), Intellect (*al-ʿAql*), or Spirit (*al-Rūḥ*) as the first creation of God through which everything else was made. These *aḥādīth* all refer to the same reality which is at once Word, Pen, Light, Intellect, and Spirit, each of these terms alluding symbolically to an aspect of that reality that was and is God's first creation and also first instrument of creation.

Furthermore, God did not create only the physical cosmos. Between the *Kalimah* and the spatio-temporal world that is the subject of the sciences of nature stand the archangelic and angelic worlds (*al-jabarūt* and *al-malakūt*) and the world of psychic beings, or, the imaginal world, to which the jinn referred to so often in the Qurʾān belong.[26] The angelic world itself, moreover, is composed of vast hierarchies ranging from the supreme *Rūḥ* that stands above creation to the archangels to the host of angels who govern the affairs of the world. Traditional Islamic literature is replete with references to them and no amount of modern rationalism and skepticism can gloss over their importance for the authentic Islamic worldview. For example, Imām ʿAlī has said:

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25. That is why both are replete with signs and symbols of God, that is, *āyāt*. The Qurʾān clearly establishes a direct rapport between the soul of person who recites the Qurʾān and also observes the phenomena of nature by using the term *āyāt* for phenomena appearing within the souls of men as well as in the cosmos, while the verses of the Qurʾān are themselves called *āyāt,* in one of which God states *We shall show them Our āyāt upon the horizons and within themselves…* (*Fuṣṣilat*: 53).
26. In his *al-Futūḥāt al-makkiyyah* Ibn ʿArabī deals with the meaning of these terms at their deepest level. See the two already mentioned works of Chittick in which passages from the *Futūḥāt* pertaining to these terms are translated and explained.

> Then He created the openings between high skies and filled them with all classes of His angels. Some of them are in prostration and do not [rise to] kneel. Others remain kneeling and do not stand. Some of them are in array and do not leave their position. Others are extolling Allah and do not tire. The sleep of the eyes and the slip of wit, languor of the body and the effect of forgetfulness, does not affect them.
>
> Among them are those who work as trusted because of His message, those who serve as speaking tongues for His prophets and those who carry to and fro His orders and injunctions. Among them are the protectors of His creatures and guards of the doors of the gardens of Paradise. Among them are also those whose steps are fixed on earth with their necks protruding into the skies, their limbs extending on all sides, their shoulders in accord with the columns of the Divine Throne, their eyes downcast before it: they have spread down their wings beneath it and they have rendered between themselves and all else curtains of honour and screens of power. They do not think of their Creator through images, do not impute to Him attributes of the created, do not confine Him within abodes, and do not point at Him through illustrations.[27]

Creation in the Islamic context means more than the creation of the physical world, which is itself a "condensation" and "crystallization" of realities belonging to higher levels of existence, levels all of which are also created by God. In all realms of the cosmos, moreover ranging from the archangelic to the material, there are laws established by the Creator which all beings obey; but these laws are not simply laws based on empirical observation of the physical world and/or their rationalistic extrapolations. This is made

27. See Imām ʿAlī bin Abī Ṭālib, *Nahjuʾl-Balāghah*, translated by Syed Ali Reza as *Peak of Eloquence* (New York: Tahrike Tarsile Qurʾān, 1984), 92-93.

clear by the Qurʾān itself in the case of the days of creation.

In several places the Qurʾān asserts that the world was created in six days,[28] while the earth was created in two days.[29] But the Qurʾān insists that time itself is not the quantitative linear time associated with the empirical observation of the physical world. Rather it is qualitative and cannot be simply measured as if it were a homogenous quantitative entity. Thus *The Night of Power is better than a thousand months*[30]; *A day with the Lord is as a thousand years*[31]; or *A day whereof the span is fifty thousand years.*[32] The genesis and history of the cosmos is based on a qualitative conception of time totally different from the quantitative time of modern geology, astronomy, and astrophysics, where one speaks of four billion years as if each year were a unit identical with the year before it, like so many identical blocks of stone set next to each other. The Islamic philosophy of science cannot but remain aware of the qualitative nature of time to which allusion is made in the Qurʾān in many verses, including the story of the *Aṣḥāb al-Kahf* (the Seven Sleepers of the Cave).[33] This philosophy cannot but remain completely skeptical about all hypotheses that interpolate the results of physical or astronomical observation in a very limited segment of time across vast periods of the past and future.

It is obvious from what has been said that in the Islamic perspective not only cosmogenesis but also the end of the cosmos are related to God. Not only are all things created by Him, but all beings within creation—and creation as a whole—return to Him. God is both the Alpha and Omega of creation and Islamic cosmology is therefore concerned with both cosmogony and eschatology. *He is the First and the Last, the Outward and the Inward*.[34]

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28. *al-Tawbah*: 7-25, 59, and *al-Ḥadīd*: 4.
29. *Fuṣṣilat*: 9.
30. *al-Qadr*: 3.
31. *al-Ḥajj*: 47.
32. *al-Maʿārij*: 4.
33. *al-Kahf*: 10-27.
34. *al-Ḥadīd*: 3.

Islamic Philosophical Cosmology

Of all the different cosmologies developed in Islamic civilization, including Ismāʿīlī, *mashshāʾī*, *ishrāqī*, Ibn Arabian Sufism, and so forth,[35] none has been as important for the development of the Islamic sciences as the philosophical cosmology which originated with al-Fārābī and Ibn Sīnā, was criticized not only by the Ashʿarites but to some extent also by Ibn Rushd, and revived by Naṣīr al-Dīn Ṭūsī. This cosmological scheme began with the First Intellect, included nine other Intellects, each of which generated a particular heavenly sphere that possessed its own soul, and ended with the Tenth Intellect which governed the sublunar region. The states and levels of being and also intellects that are metaphysical and independent of astronomy were then correlated with the Ptolemaic scheme as modified by Islamic astronomers. Since each Intellect was generated by the Intellect above, the Divine Reality reached all levels of existence and in fact generated those levels. Moreover, for Ibn Sīnā, the hierarchy of Intellects and Souls of the spheres were identified with realities that in the language of religion were called angels. Ibn Rushd perserved the Intellects of the spheres while rejecting their Souls, while Ṭūsī re-established the full Avicennan scheme.

This cosmology is much more profound than its critics have thought. In the West, however, once the Ptolemaic world was destroyed by Copernicus and Galileo, the hierarchy of being also came to be doubted in mainstream Western thought; Leibniz was the last major Western philosopher to take angels seriously. In the Islamic world Ṣadr al-Dīn Shīrāzī consciously separated the hierarchy of being from the Ptolemaic scheme through the formulation of an-

35. See our *Introduction to Islamic Cosmological Doctrines,* and our "Cosmology" in *The Different Aspects of Islamic Culture*, Volume Four, Science and Technology in Islam, A. Y. al-Hassan et al (eds.) (Paris: UNESCO Publishing 2001), 361-404, where different types of Islamic cosmology are discussed. See also William Chittick, *The Self-Disclosure of God,* op. cit.

other type of cosmology in the seventeenth century. This is one reason, among others—of which the presence of a living metaphysical tradition is the most important—why, once Muslims learned about modern astronomy, they were not as deeply affected by it religiously as were Western thinkers. The weakening of the hold of traditional cosmological schemes in the Islamic world, also based on principles mentioned above, occurred later and for reasons other than what one finds in the West.

Contrast between the Islamic and Modern Views of the Cosmos

From what has been outlined briefly, it is clear how different the Islamic view of the origin, governance, and end of the cosmos is from what has developed in the West in the domain of what has been called cosmology since the Scientific Revolution. In the Islamic perspective, God is the absolute and sole Creator, the sole giver of existence to the cosmos.[36] The universe or the created order or nature does not possess the power of creating in the sense of bestowing existence or even form, in the traditional meaning of the term. God alone is giver of existence and of forms. In contrast, modern cosmologies remain of necessity uncertain as to the origin and end of the cosmos and shift the power of God to nature, which is considered as independent of Him.

Many scientists now speak of the Big Bang theory, while yesterday they spoke of something else, and tomorrow they will point to other theories. In fact, the Big Bang theory is already being challenged by some modern cosmologists. It is interesting to note, however, that during the past few

36. Some Qur'ānic commentators in fact consider the verb "create" (*khalaqa*) to mean none other than *ījād,* or bestowing existence to forms contained in Divine Knowledge. Sufis and Islamic philosophers have spoken of the two stages of creation, namely, of the creation of the archetypes of all things in the Divine Intellect or in His Knowledge and their subsequent existentiation (the first known as *al-fayḍ al-aqdas,* the most sacred effusion, and the second as *al-fayḍ al-muqaddas,* sacred effusion).

decades modern cosmologists have spoken so often about the Big Bang and have pointed to an "origin" for the universe of some 16 billion years, at the beginning of which at very high energy levels the four forces now observable in nature (namely, the gravitational, the weak, the strong, and the electromagnetic) were one. Some even claim to know exactly what happened 10 to 49 seconds after the event of the Big Bang, after which moment everything contained in the universe with all the laws that can now be observed and studied were present.

Despite the fact that many Western theologians and philosophers have jumped at this opportunity to claim scientific support for the religious doctrine of creation on the basis of these theories, it is important for Muslims to preserve a critical perspective on this matter by basing themselves on the Islamic point of view. It must be remembered that only a generation ago, cosmologies spoke of expanding and contracting phases of the universe which some compared to the day and night of the life of Brahman in Hindu cosmology. A generation from now some other interpretation may be placed upon this most conjectural type of so-called scientific activity called modern cosmology. Furthermore, if man's consciousness can now know what went on at the beginning of the creation of the world, how could consciousness have been absent at that moment of creation?

Finally, the Big Bang theory, even if interpreted in the religious sense of the creation of the world, reduces the relationship of God to the world to the purely material level. Today, one theory after another is posited to explain the origin of the cosmos without reference to God and to the higher levels of being, cutting the "Hands" of God off from His creation. Even this relationship, moreover, is cloaked in ambiguity and based on incredible conjectures. The Divine Origin envisaged by Islam for the cosmos is in contrast not clouded by any doubts or ambiguity. Nor is the relation of this origin to the world seen as being only material. Since God has knowledge of the cosmos, the reality of everything was inscribed upon "the Guarded Tablet" (*al-lawḥ al-maḥfūẓ*)

even before material creation took place. And God bestowed existence upon the archetypes, the existence of the physical mode being the lowest and far from the only mode.

Modern cosmologists have also speculated about the end of the universe, which many see to be a final death, like that of individual stars. For Islam, however, the end of the cosmos, or its omega point, is also God, for all things return to Him. This re-absorption into higher states of being and finally the Principial Order is simply beyond the confines of modern science. Islamic thought once again harbours no doubt as to this reality so forcefully described in Islamic eschatological teachings. As this world became manifested suddenly through the *kun,* or Divine Command, so too will it one day come to an end through the Will of God, through a sudden process beyond the observable laws of nature, by becoming integrated into the higher states of being and not simply dying out slowly on the basis of a process we can only extrapolate into vast spans of time in the future from the behavior of present-day astronomical phenomena.

As for the laws now governing the cosmos, Islam sees the power of God manifested throughout the universe. It is God's agents, known as angels in religious language, who govern the events of this world according to His Will but also according to laws determined by God and reflecting His Wisdom. If most of modern science and its philosophy see the order and regularity of the phenomena of nature as proof that the cosmos does not need God to function, Islam sees this very regularity as the sign of His Wisdom and Will ruling over the universe and as proof of His existence. For a modern skeptic, proof of God's existence would come in the sun not rising tomorrow or in some other miraculous event taking place in the natural order. For the Muslim, the greatest proof of the presence of God is that the sun *does* rise every morning. For the mainstream of modern science, there are laws of nature to be studied independently of whether or not God exists. For Islam, there are no laws of nature outside God's Will and Wisdom manifested in His creation, of which He is the Sustainer, the Origin, and the End, for *God*

originates creation, then brings it back again.[37] He is, moreover, the Origin of all forms, including living forms, while the prevalent schools of the philosophy of modern science consider nature itself to be the progenitor of both forms and of life, independent of God, and not as an agent of God (as held by certain classical Muslim thinkers).

In the question of cosmogenesis as well as the history, destiny, and end of the cosmos, the Islamic perspective possesses its own definite teaching based upon the Qurʾān and *Ḥadīth*. These teachings are nearly completely at variance with the seventeenth-century European philosophical background from which modern science arose and which still dominates modern science, despite certain recent developments in the frontiers of contemporary physics which point to the possibility of a paradigm shift in modern science.[38] These recent developments must not, however, be confused with the still dominant and prevalent philosophy of modern science to which the Islamic philosophy of science stands in

37. *Yūnus*: 35.

38. We do not at all mean that Muslim thinkers should not be aware of recent developments in physics and cosmology and that they should not ponder their theological significance. What we oppose is the scientism that lurks behind so much present-day thinking in the Islamic world when the question of religion and science is discussed. As mentioned elsewhere in this book, a number of contemporary Jewish and Christian thinkers have turned their attention to recent developments in scientific cosmology and physics and tried to see in the Big Bang theory a confirmation of the Biblical theory of creation. Although this type of attempt is fraught with danger because of the ever-changing views of modern cosmologists, the studies made by such Jewish and Christian theologians should be investigated carefully by Muslims. See David Novak and Norbert Samuelson (eds.), *Creation and the End of Days* (Lanham: University Press of America, 1986); Wolfgang Youngrau and Allen D. Beck (eds.), *Cosmology, History and Theology* (New York: Plenum Press, 1977); and Robert Jastrow, *God and the Astronomers* (New York: Warner Books, 1980).

stark opposition in the basic questions of the origin and end of the cosmos, the nature and origin of the laws observable in it, and the ultimate forces and agents that govern it.[39]

The Cosmos as Subject of Study

The Qurʾān emphasizes in numerous places that the cosmos can be and in fact should be the subject of study, for the cosmos was created in truth: *He hath created the heavens and the earth with truth* (*biʾl-ḥaqq*).[40] Also, *We created not the heavens and the earth and all that is between them save with truth*.[41] Consequently the cosmos is intelligible and not incoherent, and God has given man the intelligence to know the truth at all levels of reality. The very term for "world" in Arabic, namely *al-ʿālam*, is related to the word for "knowledge" (*al-ʿilm*). The world is that which can be known because God created it with truth (*biʾl-ḥaqq*) and gave us the intelligence to know that truth. Consequently, to study the world is to discover something of that truth by which it was made and which belongs ultimately to God. Theoretically it would be possible to think that the world could have been created by God but not be a subject worthy of study from a religious and also the Islamic scientific point of view, or that it would not even be possible to study it and know it. But the Qurʾān insists not only that the world can be studied and known, but that it is worthy of study from the Islamic point of view, and that it is even incumbent upon man to do so without, however, neglecting its relation to God.

In numerous verses in the Qurʾān man is directed to

39. For the interpretation of modern physics, especially quantum mechanics, on the basis of a fundamental paradigm shift which is of the utmost significance for the Islamic view of cosmology and science, see Wolfgang Smith, *The Quantum Enigma* (Hillsdale: Sophia Perennis, 2005); and his *The Wisdom of Ancient Cosmology* (Oakton: Foundation for Traditional Studies, 2003).

40. *al-Naḥl*: 3.

41. *al-Ḥijr*: 85. This theme is so important that it is repeated in several other verses in the Qurʾān such as *al-Fāṭir*: 5; *al-Jāthiyah*: 22; and *al-Taghābun*: 3.

the phenomena of nature and asked and even ordered to study them. There is in fact a very rich Qurʾānic vocabulary relating to the study of the phenomena of nature. Such verbs as *yarā*, *yafqahūn*, *yatadhakkarūn*, *yaʿqilūn,* and *yaʿlamūn* are used in different verses with different meanings, alluding to the level and depth of understanding the phenomena of nature.[42] There is implicit in the Qurʾān a hierarchy in studying and understanding nature. There is not just one level of knowing or one science of nature but many, ranging from simple observation related to seeing (*ruʾyāʾ*) to intellection (*taʿaqqul*) and in-depth knowledge of the essences of things (*ʿilm*), which must not under any condition be confused with simple ratiocination any more than one can simply identify Qurʾānic *ʿilm* with modern science, a sin of which many modern Muslims thinkers are guilty.

The Qurʾān asserts that God taught Adam the "names" of all things, as in the verse *And He taught Adam the names, all of them*.[43] By names (*asmāʾ*) is not of course meant names in the ordinary sense of the word but essential reality or nature. Man's intellect has been created by God in such a way that he is able to know the essential reality of all things and the power of his knowledge in contrast to even that of the angels has no limit, because it can range from knowledge of the most outward aspect of the reality of an object to its most exalted or inward aspect as it resides in God's knowledge, as well as, of course, knowledge of God Himself. Human knowledge cannot of course encompass all things; that capacity belonging to God alone.

According to the principle of adequation, the faculties of the knower must be adequate to the object to be known. Man as seen by Islam has been created in such a manner that there exists within him a hierarchy of faculties ranging from the outward senses to the highest level of the intellect,

42. This fact has been mentioned by Maurice Bucaille in several of his writings, but he interprets this in a scientistic manner which differs from the views of traditional Islamic thinkers.

43. *al-Baqarah*: 31.

through which he is able to know all levels of reality from the lowly sand pebble to the One, the Absolute, to Whom reference is made in *lā ilāha illa'Llāh*. Man is also able to know the created order not only on the level of physical reality but also symbolically on all levels of existence reaching ultimately to the Divine, whose knowledge of all things is the root of their reality.

The phenomena of nature can be and are a worthy object of study, provided they are seen not as facts divorced from higher orders of reality but also as symbols. Their order, harmony, and laws reveal the Omniscience and Omnipotence of God, as well as His Oneness and Wisdom. These phenomena are signs or portents (*āyāt*) of God, with a message that man is able to read if he accepts and understands the message and meaning of those other *āyāt* contained in the revealed Book. That is why the cosmos itself has been called the "macrocosmic Qur'ān" or the "Qur'ān of the Created Order" (*al-Qur'ān al-takwīnī*). By virtue of the Qur'ānic revelation, man is given the possibility of reading the cosmic text and deciphering its "words" and "letters".

A sign (*āyah*), however, is always a sign of something other than itself. It is incoherent and inconsequential if considered only by itself and as a completely independent order of reality. That is why, while the Qur'ān encourages the study of nature, and the remarkable development of the natural and mathematical sciences in Islamic civilization is a direct consequence of the teachings of the Qur'ān and *Ḥadīth*, the sciences of nature envisaged by Islam are not the same as those of modern science.

Since the seventeenth century's Scientific Revolution, modern science has studied the physical aspect of nature as an independent and autonomous domain of reality with fixed laws of its own. The Creator has been cut off from His creation, even in the case of those Western schools of philosophy of science which still accept the reality of God. The Will of God is no longer seen as being operative in His Creation, nor are the higher levels of reality, such as the angelic realm, considered of any consequence in the opera-

tion of the natural world. Moreover, the knowledge of the natural world has become limited to the empirical to the extent that, despite the fact that some of the greatest scientific discoveries (such as the laws of planetary motion formulated by Kepler or the theory of special relativity of Einstein) were not at all based on induction and empiricism, there is constant talk about the scientific method based solely on observation and ratiocination. In the prevailing philosophies dominant in the West, in whose matrix modern science has for the most part grown during the past four centuries, nature is the subject of study—but merely as an autonomous reality of a purely physical and quantitative order having no relation to higher levels of being, nor to God, except to some extent in certain philosophical schools which at least accept God as the Original Cause at the beginning of creation. The knowledge of nature has also been reduced to only one kind of knowledge that soon came to be known as science. This science studies the phenomena of nature but only as facts, not as *āyāt* of God.[44]

In contrast to this limited view of what constitutes science, Islam has also ordered man to study natural phenomena, but not only as facts. It has not limited nature to only its physical aspects nor the means of knowing nature to only the empirical. Islam has always encouraged the study of nature, which would include a science of nature similar on a certain level to modern science but not limited in the same manner. Islam has envisaged the possibility of many sciences of nature and has refused to accept a particular science of nature as *the* science. Moreover, Islam refuses to accept the legitimacy of any science that would study the cosmos in forgetfulness of God. The Qur'ān insists that the world of creation is worthy of study, but it is worthy because at all levels of its activities and processes and in its very existence

44. See our *Man and Nature* (Chicago: ABC International, 1997). We have dealt more extensively with the question of the contrast between religious and scientific studies of nature in our *Religion and the Order of Nature* (New York: Oxford University Press, 1996).

nature reveals the Wisdom of God and brings about in man that sense of wonder and awe that contribute to his spiritual perfection. All sciences of nature are legitimate and in fact encouraged, provided they reflect something of that truth (*ḥaqq*) with which the world was created, and that they enable man to contemplate in the created order the Wisdom of God and to use the science gained thereby in His service. No science can be acceptable to Islam that does not in some way remind man of the Wisdom of the One from whom everything issues and to whom everything returns.

Four Conversations

3

Islam, Science, and Muslims

[This conversation took place over two sessions in February and March 2003. It deals with a wide range of issues centred around the general theme of Islam, science, and Muslim attitudes toward modern science. Other issues discussed in this conversation include various aspects of challenges posed to Islamic polity by a global era driven by science and technology; revival of the Islamic tradition of learning; the role of Muslims living in the West in the revival of the Islamic tradition; and ways and means to preserve various aspects of Islamic civilization.]

Iqbal: For almost two centuries now, Muslims have faced a dilemma which seems to be insurmountable: they can neither avoid living in a world driven by modern science and technology produced by the West, nor can they live in such a world without destroying the Islamic characteristics of their civilization. The answer suggested by certain nineteenth century reformers was to import Western science and technology but not the value-system and the worldview that characterizes the modern West. Their premise was based on the notion that science and technology are value-free. This is a false notion, as we now know without any doubt through the work of numerous philosophers and writers, both Muslim and non-Muslim. You have yourself emphasized the need to

ensure the preservation of the "Islamic space"—that unique aspect of Islamic civilization that is reflected in its relationship with the Transcendent. You have also produced some of the most insightful critical studies of modern science. Your outlook on modernity in general, and modern science and technology in particular is, however, severely criticized by some writers for lacking practicality. What is your response to this criticism?

Nasr: In the Name of Allah, the Infinitely Good, the All-Merciful. This is a vast question that has many dimensions. There is a practical aspect and a theoretical aspect. As far as the practical is concerned, I accept that if, let us say, someone in Bangladesh has malaria, we should try to find the best vaccine against malaria to cure this person. As for the various forms of Western science—whether it is in the form of medicine or electronics or other things that are mostly technology rather than science but nevertheless applied science—that are coming to the Muslim world, they are, on a certain level, impossible for governments to avoid. No government can say it will not have telephone system in its country or something like that—there is no doubt about that.

However, there is a much more profound issue that is involved. Most of the political centers of power only concentrate on the external aspects of this question, with the idea that more science means more power and hence the Muslim world should try to follow as much as possible the developments of technology and match Western technology and science and even outdo the West—like the Japanese, who make better cars than those made in Detroit. This mentality, which is very prevalent in the Muslim world, is extremely dangerous, especially now that a part of the

human family—that is, the West, which has already developed a technology on the basis of modern science—is already facing insurmountable difficulties and problems such as the questions pertaining to the destruction of the environment, global warming, those related to defining the human person and ethics, and a thousand other questions. If the Muslim world indiscriminately also tries to join the camp of confusion and the process of the destruction of the environment in the name of being in the twenty-first century, I believe such a step will be suicidal.

So, on the practical level, while the Muslim world opens up to the application of modern science and acquires pure science itself, it has to learn this science and its applications with a critical eye, a certain amount of constraint and restraint in their application, in the sense that it should not necessarily jump into every development and emulate everything that is going on in the West. As far as the theoretical aspect is concerned, Muslims must try to master the Western sciences; there is no doubt about that, but this mastery must be combined with a critical perspective based on the Islamic intellectual tradition.

Having said that, I now come to the second point, which I have been emphasizing for so many decades. Islamic civilization cannot simply emulate Western science and technology without destroying itself. Anyone who says anything else does not really understand the philosophical foundations of modern science or the impact of the applications of this science upon the world. If Islamic civilization wants to continue to be a living civilization, it is imperative for its representatives to examine the foundations of modern science at the theoretical level. They must initiate a process that will reinterpret, reintegrate,

and accept or reject various aspects of modern science in light of Islam's own worldview and metaphysical vision of the nature of Reality. And on the practical level, it must try to evolve independent criteria of what to accept and what not to accept.

So there are two different dimensions of what to do with modern science. One is on a practical level: Should we have airplanes or not? On that level there are certain decisions that cannot be avoided in the fields of medicine, communications, and so on and so forth. But while doing that, the Muslim world cannot go, as the Americans call it, "gung ho", that is, going headlong down a blind alley, trying to simply emulate whatever the West is doing. First of all, even if we do that we will still be always behind the West; and, secondly, if we copy the errors of modern technology, which is wedded to greed to a large extent, and which is not independent at all of the failings of the human being, we will simply follow these errors, making the situation much worse for the Muslim world. Emulation has to be done with a fair amount of restraint, giving the Muslim world time to develop alternatives wherever possible.

On the theoretical level, there is a much more daunting task: to first of all try to understand Western science in depth; secondly, having understood it in its own terms, then try to understand it in light of the Islamic worldview, and not to try to cover over the very major differences that exist between the philosophy of modern science as it developed in the seventeenth century in the West and Islamic philosophy and Islamic thought which, in fact, gave rise to Islamic science.

Iqbal: At the practical level, the solution you have just outlined seems similar to that which has been with us

for almost three hundred years. It was first formulated by the reformers of the eighteenth century and by Muslim thinkers in the Ottoman Empire as well as by people such as Muhammad Ali Pasha who saw Western armies at their doorsteps. They understood that they needed modern technology in order to cope with this military threat. They formulated the solution in terms of acquiring just enough modern science and technology to cope with the changed situation. But is it really possible to have some type of restraint in this process? For instance, when we import modern communication tools, such as cell phones, they inevitably destroy the pre-existing modes of communication and interaction—they come as a complete package; one cannot really pick and choose components of that package, and if the entire package is imported, it invariably brings numerous aspects of Western culture, which undermine the Islamic space.

Nasr: You are right. I am the last person to think that modern technology is neutral or benign. Taken as a whole, although it offers some obvious benefits, it has a demonic aspect to it which destroys much of the spiritual ambience, both inward and outward, of the human being. There is no doubt about this matter. I want this to be very clear in our discussion. In fact, when I talked about restraint, I meant that the Muslim world must not ape modern technology blindly but be able to develop its own critique of modern technology, as was done in the nineteenth century in England by William Morris and John Ruskin and later in the twentieth century by many Western writers. We have had very little of that kind of critical perspective in the Muslim world. We must be fully aware of all the dangers. You mentioned the cell phone, which is a very good example. The cell

phone has really changed the space in which many human beings live. It destroys that inner quiet space where we are alone with God. This little tool makes it inevitable for its users to nearly always be connected to the turmoil of the external world. This is not something accidental. It is something very profound as far as its effect upon the human soul is concerned.

Having said that, let us focus on certain other dimensions. For instance, let us consider a fire station or a government agency that needs to have immediate contact with its personnel and so forth. Such agencies are not going to accept that they should not adopt use of the cell phone because of its spiritual shortcomings. Where there are major issues which new technologies seem to solve despite their negative consequences, obviously on a practical level no Muslim government is going to accept not making use of the technologies.

This is also the case of most ordinary people, among whom these phones are now so common. What we as thinkers have to do, however, is to provide a critique to try to show why and where restraint is needed and demonstrate how, in deeper ways, the whole ethos of modern science and technology—this whole enterprise—is integrally linked to its various parts, so that one cannot uncritically accept one part of modern technology and say uncritically that it is wonderful, leaving aside other aspects—especially if one has already accepted the technological worldview, according to which every problem has a technological solution. I do not believe that is the case. Modern technology also brings with it a certain "value system", a certain manner of being, a certain way of acting, a certain conception of time. Paradoxically, all

time saving devices of modern technology destroy time. The email curtails the time in which you have to answer; it puts pressure upon you to answer immediately.

I am the last person in the world to think that Islamic civilization can choose a part of Western technology which is considered good, claim it is completely harmless, and then reject another part. Whatever form of modern technology is adopted, even if positive on a certain level, will bring with itself its negative effects, though one can nevertheless be judicious to mitigate these effects. However, at the practical level, I cannot see how many forms of technology can be avoided at the present moment of history. Matters may change if we preserve a guarded and critical attitude.

There are certain aspects of Western technology that are going to be adopted by Muslim governments no matter what you and I say. I wish this were not the case, but it cannot be avoided. Hence, one should at least try to provide a critique of modern technology and attempt to curtail its negative influence as much as possible. I wish we could put it all aside and develop our own Islamic technology as was done by Muslims during the Middle Ages, but, since this is not possible at the present moment of history, what we need to do is to change the mindset of Muslims and make them aware of the negative consequences of being governed by machines. Most Muslims educated in modern institutions, especially in the subcontinent of India, carry with them a very deep scientism which is held almost religiously, you might say. And it is very difficult to overcome that attitude.

On the intellectual level, what we need to do is to be

brave enough to show the shortcomings of modern science and try to provide another intellectual and spiritual framework for understanding that science. And then we must take the next step of developing an Islamic science on the basis of our own scientific tradition—something about which I have now spoken for four decades. Thus, what is needed is to first master the modern sciences—while remaining deeply rooted in the Islamic intellectual tradition—and then take the next step within the Islamic framework, and not in the framework of modern science. No Muslim physicist will say he does not care about what quantum mechanics has discovered, that it is irrelevant. What is needed is to understand quantum mechanics and then reinterpret it completely differently from the way in which the Copenhagen School has interpreted it on the basis of the bifurcation, the dualism of Cartesian philosophy, which underlies the whole of the modern scientific enterprise.

If we can do that on the intellectual level and create an authentic Islamic philosophy of nature, or metaphysics of nature; and, secondly, an Islamic science of nature on the basis of both our own scientific tradition and what the Western world has discovered; and, finally, integrate the latter into our own tradition, then it would be possible to create our own technologies on the basis of that science. Today, however, the economic, military, and political forces of the modern world are so strong that if you just say 'let us simply reject modern science and technology'—no one is going to listen. That is the whole problem.

If you look at the present Muslim world, whether the governments are pro-Western or anti-Western, monarchies or republics, whether they are the product of Islamic revolutions or are secular, they are all unified

in their glorious hymning of the praises of modern science and technology. It is that attitude which has to change. And I think that, thank God, during the last thirty years there has been at least some change in this direction, in developing a more critical attitude toward scientism, due partly to my own humble efforts; in this domain things are better now than they were thirty, forty years ago. Now at least there are *some* Muslim voices which understand that this is not the way to go, that the Islamic intellectual tradition has to be able to provide a critique of modern science and of modern technology. And if we have no choice in building an ugly bridge over this river, we should at least not say 'Oh, how wonderful this technology or science is'; we have to change our attitude. If we have no choice but modern medicine, we have to at least realize its shortcomings, all the while attempting to redevelop our own traditional holistic Islamic medicine, which has been left on the back burner, you might say. Now that you have acupuncture coming to the West, certain people are talking about reviving our own tradition of medicine.

I disagree completely with Muhammad Ali Pasha and others who said 'just go to Europe and learn how to make guns and return and we shall have a better army and forget everything else'. We cannot do that; everything goes together—from the making of guns to computers and cell phones, to the making of steel, to the making of airplanes. Modern technology itself imposes upon man a type of worldview. It changes man into a machine in many ways. And Islamic civilization must try in every way possible not to have that happen to it. When I say that governments now have no choice, on certain levels, I do not mean that we will never have a choice. But at

the present moment, we have to employ a delaying tactic. That is, rather than jumping headlong into emulating Western science and technology in every field, we must do so where it is absolutely essential, where there is no other choice—meanwhile buying for ourselves time to create our own science and, *inshāʾaʾLlāh*, one day our own technology.

Iqbal: At one level, this whole question of the revival of Islamic scientific tradition, I feel, is intimately connected to the revival of Islamic tradition of learning itself.

Nasr: That is right.

Iqbal: You were fortunate to have had the opportunity to grow up in an ambience permeated by the presence of masters of traditional philosophy and Sufism, something you have eloquently described in your intellectual autobiography,[1] but what opportunities are now left for Muslims to grow up in such a rich intellectual and spiritual atmosphere? I am also thinking about Muslims living in the West: how do we provide that ambience to our young men and women in the West? We have not been able to create any institutions in the West where our young generation can have a chance to imbibe the tradition.

Nasr: Let me first turn to the Muslim world. What we need to do, rather than imitate Western educational institutions—which we have been doing for the past two hundred years, since the time of Syed Ahmed Khan and others—we need to strengthen our own traditional Islamic educational institutions. Many of these institutions (*madāris*) have unfortunately become more and more narrow in their vision in many

1. Lewis Edwin Hahn, Randall E. Auxier, and Lucian W. Stone, Jr. (eds.), *The Philosophy of Seyyed Hossein Nasr*, op. cit., 3-85.

Muslim countries during the last few centuries; for example, the exclusion of the teaching of philosophy and logic, not to talk about mathematics and astronomy, from their *curricula*.

By saying that we need to reestablish and re-strengthen the *madāris*, I do not mean to say that it should be done through violent exclusiveness, political or otherwise. I mean the revival of the real and the authentic *madrasah* system, from within. Furthermore, we need to strengthen, within the Muslim world, the traditional method of transmission of knowledge and the combining of knowledge with ethics and spiritual qualities and virtues, which must be transmitted along with knowledge. And this is something that has to be done throughout the Muslim world—from the *madāris* of Malaysia to those of Morocco. In certain areas, for example, like Iran, there are some hopeful signs: many new *madāris* with a more extensive curriculum have been established recently, for instance those in Qom. Of course the quality is not very high in many cases because of the very large number of students, but there also exceptional cases. Moreover, there is a large number of very fine young scholars who also have experienced the transmission of the intellectual and spiritual aspects of Islam and not only the legal training. We need to strengthen that total traditional educational experience within the Muslim world. It has not died, by any means, but we just need to strengthen it.

Islamic civilization did not succeed in transferring the positive qualities of this *madrasah* system to the new universities that have been established in *Dār al-Islām* since the nineteenth century—whether it be the University of the Punjab, or Calcutta, or Allahabad, or Istanbul, or Tehran, or Cairo. Those

institutions have simply tried to emulate the Western university system. Consequently much of the quality of the relationship between master and disciple and the spiritual ambience has been left out, not to speak of the content of the courses that have been taught. No Muslim country has fully succeeded in integrating its traditional and modern educational institutions which Muslims founded in their own countries in order to teach things like modern engineering, mathematics, physics or medicine, et cetera. This is a major task that the Muslim world itself has to carry out so that this dichotomy between the two types of educational systems can be gradually overcome.

The World Muslim Educational Congress, organized by the late Syed Ali Ashraf, Dr. Zubair, Abdullah Naseef, and myself among others, held in 1977, led to the foundation of several Islamic universities, attempted to carry out this task but, unfortunately, this enterprise did not succeed completely because of certain denominational and theological perspectives which did not allow this movement to take full advantage of the Islamic intellectual tradition. For example, Islamic philosophy was not taken seriously in these Islamic universities, and when Islamic philosophy is not taken seriously the other Islamic intellectual disciplines such as the Islamic sciences will not be taken seriously.

You may teach the *Sharīʿah* on one side, and modern science, modern sociology, and modern economics on the other side, and then call this an Islamic university, but in reality this does not constitute an Islamic university. An Islamic university is a university in which all subjects are viewed in the perspective of Islam and in which spiritual and ethical training accompanies academic and intellectual training.

The best example of such an integrated transmission is what was done in the West in the Middle Ages. The Western universities were created on the basis of the *madrasah* system, but they were Christian. So they took the Islamic curriculum and many educational practices as well as subjects and they Christianized them. They integrated them into their own theological and philosophical perspectives, and they created the medieval universities which were totally Western, which were totally Christian, and very different from the Islamic models from which they had learned so much. Unfortunately, we have not been able to do the reverse. The current situation in the Muslim world itself is far from being ideal.

When we come to the situation of Muslims in the West, what we need to do is to transfer the Western intellectual methodologies and manners of research to our institutions in the West through the use of our own intellectual tradition and sources, ideas, as well as human contact. As far as books are concerned, I think this has already been accomplished to some extent during the last forty years; that is, we have translated a considerable number of books from the Islamic intellectual tradition into contemporary languages and interpreted Western thought from the Islamic point of view; I myself have contributed humbly in this effort to the best of my abilities and others have done the same.

We now have many books on Islamic philosophy and sciences, theology and Sufism, and so on and so forth, translated or written from the Islamic point of view in a contemporary language comprehensible in a Western ambience. And such texts are not as rare as they were forty years ago. But what we do not have is a center, a place of high quality, where students

could be trained in an Islamic way. We now have several Islamic colleges in the United States but these have not been very successful so far.

Now there is talk of an Islamic university being established on a large scale in New York State, which would be the first major Islamic university in America. And they think of making it like Georgetown which is a Catholic University, or like the Yeshivas, which are Jewish institutions of higher learning, or like the Albert Einstein University, or something like that. Whether they will succeed or not, only God knows; in any case I am trying to help them along. But before we get to establishing big universities, I would like to see a smaller place, where twenty to thirty students could be trained under a few teachers who carry an intimate knowledge of the tradition within themselves. I am approaching the end of my career, and perhaps the end of my life—only God knows—but I have trained several generations of students and a dozen or fifteen very good young scholars over the last few years, who are now first-rate younger scholars. I hope to God that I have been able to transfer something of the tradition to these young people.

What we need is a smaller place where these people and those like them get together, and every year train a number of Muslim scholars. It is as if you were to have a handful of wheat. If you bake with it, you will get a loaf or two of bread and the wheat would be finished. But if you plant it, then next spring, you get a whole field of wheat and you would be able to feed a large number of people.

Islamic education here in the West should move from a smaller unit to a bigger one. If you establish a small unit of very high quality, with twenty to thirty people

at most, all gifted Muslim students, and transmit to them the real heritage of Islamic intellectual life, including the sciences and all that goes with them: philosophy, logic, mathematics, spiritual questions, all of these, then those people, in turn, could train others and, in this way, after about twenty years, you would have several hundred people. Then they could become the faculty of a major university. I would go step by step like that.

I often suggest to my friends that we should try to put our efforts together and create one single center devoted to, let us say, "Islamic Intellectual Sciences", or whatever you want to call it. It would have to include philosophy, logic, and some theology, and related subjects. One would not even have to give degrees. It could be a post-doctoral institution, like the Center for Advanced Studies at Princeton. It could be a place where devout Muslims who have Masters or Ph.Ds and who are interested in these matters could come and receive this transmission. As for those who could serve as the transmitters of the tradition, there should be no problem in getting at least a few such people. There is a small number of very gifted young Iranian philosophers and thinkers who have come to America recently, whose English is as yet not that strong but who have the knowledge, who have spent fifteen to twenty years studying the traditional sciences with traditional teachers. They can be employed in such an institution and there are many others who would join and, gradually, the goal could be accomplished.

Iqbal: Can we further explore the practical aspects of this process? I recall that at one time you were involved in an effort to set up such a center at Karachi with the late Hakim Muhammad Said but the effort did

not succeed. The governments in the Muslim world, as you said, are not interested in this venture; they perhaps do not even understand the need for such a revival.

Nasr: That is right…

Iqbal: That is why I wanted to start with the West—it is paradoxical—but I feel that here we have a greater chance of success.

Nasr: I agree with you to a large extent, but there are some exceptions in the Muslim world.

Iqbal: So, considering the sizeable presence of private businesses in the Muslim world, it should be theoretically possible for people who have the money and the resources to establish such institutions, but they seem uninterested. The national resources are in the control of the governments, who are not interested. How can the process of revival be initiated in such circumstances?

Nasr: I think there are some efforts already being made in this respect; there are at least a few good candidates for success in Iran, Malaysia, Muslim India, Pakistan and Turkey. In Iran especially, there are a number of universities that are being run by the '*ulamā*' and not by the government—these are truly *madāris* which are also introducing foreign languages, modern sciences and other subjects taught in modern Western institutions but in the matrix of Islamic thought. And I hope that a lot of good things will come out of those programs. But it is true in general that the governments of the Muslim world are not interested in the revival of the Islamic tradition of learning. If there are small units of Islamic learning formed here and there even in the Muslim world, the larger public and governments will sooner or later have to show a greater interest because of the quality of peo-

ple being trained in these institutions.

I established the Iranian Academy of Philosophy, or the Imperial Academy, as it used to be called, with a very good budget which I was able to get directly from the Queen without going through governmental red tape. And within a few years, the Iranian Academy showed remarkable accomplishments. In fact, the world came to know about it. Many people in Iran, even in the government, who had been skeptical about it were very surprised, and soon very supportive. The reason was that the Academy published first-rate articles in its own journal, *Sophia Perennis* (*Jāwīdān khirad*), as well as in international journals, and leading philosophers wanted to come to Iran to see what was going on. It also trained a number of Muslim students rooted in our own intellectual tradition but also fully conversant in Western thought

So, though you cannot change the mind of Muslim governments immediately, you can succeed by showing results. Of course, universities are being run by the governments, but what you and I are talking about is not going to occur at a macro level, like in a university of sixty thousand students. It will only occur if you have a small number of people. I think we should go—at the present moment in Islamic history—not for large quantitative projects in the field under discussion here but for small qualitative pilot projects, which, once successful, will attract others precisely because of their achievements.

Iqbal: The process of revival simultaneously requires an understanding of the process that led to the decline of the Islamic intellectual tradition. There are many studies on this process of decline written mostly by the Western scholars, but they are generally based on false premises and provide false answers, like the

Goldziher thesis positing "foreign sciences" against "Islamic Othodoxy", or like the simplistic answer that al-Ghazālī killed science in the Muslim world. But there are no real answers; at least I do not know of any. This is also an area in which you have not written much. There are several aspects of this question, including the question of dating. What are your views on this: when and why did the Islamic intellectual tradition wither?

Nasr: First of all, I do not believe that the whole of Islamic tradition declined in every aspect centuries ago. This is not true. For example, we can talk about art, which is a very important aspect of Islamic civilization. The art of weaving, for instance, did not decay until very recently. Some of the most beautiful Persian carpets were woven in the nineteenth century. These are masterpieces. Likewise in architecture—beautiful buildings continued to be built right into the twentieth century. So, you have to ask what fields you are dealing with. Intellectually, for example, Islamic philosophy, which is the heart of the Islamic intellectual tradition, had a major revival in Persia in the nineteenth century and also produced very important figures in India, for example, the scholars of Farangi Mahal, in Lucknow, the Khayrabadī school, and others.

One cannot, then, speak of a general decline. There is no doubt that all civilizations have decayed in a certain manner. If you take, as a norm, a spiritually vibrant organization which we call civilization, all non-Western civilizations have decayed passively whereas Western civilization has decayed actively. That is the way it was until quite recently. Since the last century, non-Western civilizations are becoming more dynamic, but that does not mean they are not

decaying, because dynamism is oftentimes not according to their own spiritual norms. For the most part they are now also decaying actively. This is a very complicated issue, which I have addressed in several of my essays during the past few decades.

But let us turn more specifically to the question of the sciences and philosophy, because they go together—the intellectual tradition of Islam does not separate the philosophical and the scientific. The Muslim world suffers from the fact that much of its understanding of its own intellectual tradition is dependent upon Western studies of Islamic philosophy and the sciences.

The Western studies, which go back a long time but in the modern sense began in the nineteenth century, have looked at the Islamic intellectual tradition from the point of view of the West. And that is quite logical. For them, all of these schools of Islamic sciences and philosophy came to an end in the thirteenth century, when the intellectual contact between the Islamic World and the West broke. It has taken a long time, several decades, for people like Henry Corbin, Toshihiko Izutsu, myself, and many others to try to reassert the truth of the idea that Islamic philosophy did not end with Ibn Rushd. And during the last few decades, scholarly works have been carried out in the field of the physical sciences, much of it by Western scholars, works that have gradually changed the earlier idea that Islamic science began to decay and even disappear with the fall of Baghdad in 1258, or something like that.

A few decades ago there came the discovery of the Marāghah School. We owe much of that discovery to E. S. Kennedy and several other Western schol-

ars, as well as to a few Arab scholars such as George Saliba and Roshdi Rashed. Then we have the discovery of Mamlūk astronomy and astronomy in the Yemen. David King did a lot of work in this field and revealed a whole new chapter in the history of Islamic astronomy. In the last few years, in Istanbul and other places in Turkey, many studies have been carried out on the sciences in the Ottoman period, and a new chapter is being added there to the history of Islamic science.

My own view is that if we study all of these later works seriously, even from the point of view of Western science—and we are now unconsciously appraising from the Western point of view, mostly because Western science is considered to be so important that we consider it the barometer of Islamic civilization, as a kind of Western standard that we have adopted, which I do not accept—though I think the Muslim intelligentsia accepts it in general, even if we accept that, this date for the so-called decline of Islamic thought, especially in the natural sciences, must be pushed forward, that is, the period of decay would not be in the thirteenth century but much later. For example, just in the last two or three years, people have discovered, and again this goes back to Professor Saliba of Columbia University, that Shams al-Dīn Khafrī, who was always considered in Persia to be a major theologian or philosopher, living from the fifteenth century to the sixteenth century, was also a major astronomer. He was one of the most important of the later astronomers.

I believe that if we investigate the whole of the Muslim world, especially in later centuries Muslim India, Persia, and the Ottoman world and not only the Arab part of Islamic civilization, we will discover

that very notable scientific activity continued to take place up to the eighteenth century, in some fields perhaps even later into the nineteenth century, until gradually Western science began to come into the Muslim world and it, then, slowly replaced the earlier Islamic medical and scientific tradition. In the field of philosophy, however, the Islamic philosophical tradition has never died. It has had some of its greatest representatives in the twentieth century in Iran, people such as ʿAllāmah Ṭabāṭabāʾī and Sayyid Muḥammad ʿAṣṣār, with whom I myself studied.

We have to write a definitive and complete history of Islamic science, especially for the later centuries, which we do not have at the present moment. In this field Muslim scholars have been for the most part without much initiative, emulating what Western scholars have said, and Western scholars until recently have concentrated on the earlier period of the history of Islamic science about which we now have a great deal of knowledge. So a complete history of Islamic science from our own point of view is the first thing that has to be done before we can judge about the when and the how of the decline of Islamic science.

If we do this, I believe, we shall find that the Islamic scientific tradition was at the peak of the history of science—if we were to envisage it in the manner of George Sarton—from, let us say, the eighth to the fifteenth centuries. After that it was no longer at the peak of global scientific activity and the Western scientific tradition became more active. Nevertheless, the Islamic scientific tradition continued in a creative manner into the twelfth to thirteenth Islamic centuries, that is, the eighteenth to nineteenth centuries of the Christian Era. And Islamic philosophy

continues to our own day.

Now one might ask the question, why did—I would not call it decline—but the decrease of activity take place in the Muslim world? I think that this question itself is badly posed because it is based on the presumption that the normal activity of every civilization is to be continuously active in the sciences of nature and mathematics. This is not true. We know that this is not true when we study the history of science, for instance during the very long period of Babylonian civilization in Iraq, thousands of years of Egyptian civilization, or Roman, Chinese and Indian civilizations—civilizations with a very long history. In many cases, the great scientific activity in fact came when these civilizations were dying. That is what George Sarton used to say. For example, in the case of the Babylonian civilization, which is known for its great scientific works, science came at the time of the death of that civilization. The same is true for Egyptian civilization in some scientific fields. Certainly the same is the case of Greek civilization, that is, the great works of Greek science—of Ptolemy and Euclid and people like them—came after the Greek world had fallen apart, its religion was dying, the culture was weakening, and its political life was being dominated by the Romans. There is no doubt about these facts.

In other civilizations, such as the Indian and the Chinese, that have had a very long history and are still alive, we see periods of intense interest in what is called the sciences today, let us say the mathematical, physical, astronomical, chemical or alchemical sciences, and periods in which there was not such great interest in these disciplines. And during the period when there was not such great interest, oftentimes

these civilizations produced great art, architecture, statecraft, literature, and many other things.

Science in Islamic civilization, in contrast to the Babylonian, began very early; that is, it began with its peak of scientific activity early in its history. Jābir ibn al-Ḥayyān, for instance, lived in the second Islamic century. The field of alchemy has never surpassed Jābir. In the ninth century you already had very great astronomers and mathematicians. By the tenth century you had people such as al-Bīrūnī and Ibn Sīnā. It continued on a high plateau with certain ups and downs for a long time, for many centuries, and then gradually the energies of the civilization turned elsewhere.

Even at the dawn of the sixteenth century, when the West had just begun to gain power and the Age of Exploration had commenced, the Europeans had discovered the Americas and reached Asia through the Indian Ocean by navigating around Africa, but they had not yet penetrated the lands of *Dār al-Islām*. At that time, the Muslim world was still very powerful politically. Probably the most powerful empires in the world at that time were the Ottoman and the Ṣafavid, and the richest empire perhaps was that of the Moghuls of India. Economically, as well as politically and militarily, they were still vibrant and forceful. Artistically, some of the greatest works of art in the history of mankind were created during this period. The Taj Mahal, that wonderful Mosque in Iṣfahān which is really a work of art as much as it is of architecture, the Sultan Ahmad Mosque in Istanbul—incredible works of architecture, of calligraphy, of literature, of many other things were produced at this time.

So to judge a civilization by its interest in science and then ask, "why did science decay in it?" and then equate that decay with the decay of that civilization itself is false, because the life of a normal civilization—of any civilization that we know through history—has not been known to have been simply synonymous with the life of the sciences of nature or of mathematics in that civilization, so as to put all of its creative energies into those domains. There comes a moment when a civilization is satisfied with its cosmological worldview, its view of the cosmological sciences, and you might say the thrust of creative activity then turns to the domains of philosophy, mysticism, art, literature, law, and many other fields.

I think we should not even ask the question in this way. Islamic civilization had a longer period of intense interest in the sciences than any other civilization we know, including the Western, because it is now only about four centuries since the time of Galileo that the West has shown intense interest in the sciences and made science its central intellectual concern. We do not know what is going to happen three hundred years down the road. We should not extrapolate; we simply do not know. I think that to have a deeper view of this matter, one should try to understand the dynamics of the creation and propagation of science within Islamic civilization in terms of Islamic civilization itself.

The question of revival of which you spoke so well and so truly must be answered in light of our own Islamic scientific tradition, which is something about which I have been writing for more than forty years. It should not be posed in this false fashion in which it is being discussed today, that is, to say that Islamic science died seven hundred years ago and now we

are trying after so many centuries to revive it. We will never be able to revive it authentically if that is our view.

Modern science should have been grafted upon the body of the existing Islamic scientific tradition in the nineteenth and early twentieth centuries, when these traditional Islamic sciences were still alive to some extent, certainly more alive than they are in most Muslim lands today. Something of that nature was done in the field of medicine during the twentieth century by the Hamdard Institute after the partition of India, and by Hakim Mohammad Syed and Hakim Abdul Hamid, God bless their souls, who died just recently—one of them murdered in Karachi, as you know. The work they did grafted, in a sense, some of the techniques of Western medicine onto the existing medical tradition of the Muslim world. It is too bad that such work did not take place more generally in other fields.

A project that has been a kind of ambition and a desire of mine all my life is precisely this: to be able to write a complete history of Islamic science from the point of view of Islamic civilization. It is a work that I began in the form of *The Annotated Bibliography of Islamic Science* in the 1970s. Seven volumes were completed before the Iranian Revolution. Three came out under my own direction, and the other four are finally coming out after all these years.

This project of assembling a complete bibliography of Islamic science in all languages was conceived as a major step toward a true appraisal of Islamic science, complementing my *Science and Civlization in Islam*, based on the study of the history of Islamic sciences from the Islamic point of view. I think that the ques-

tion of the revival of Islamic science, as you say, is totally and completely related to our understanding of the decay, or death, or whatever else you may want to call it, of Islamic science before modern times as well as to its earlier history written not on the basis of only partial knowledge but in the examination of all the sciences and from the perspective of our own intellectual tradition.

Iqbal: I think this question looms large because the West was able to turn its scientific discoveries into aggressive technologies and then use those technologies to conquer the Muslim world and destroy its institutions. Therefore most Muslim reformers, of whom we talked earlier, thought that it was only Western science that conquered them and their solution was to prescribe acquisition of this science. But can you suggest any remedy to the present situation? You gave the example of medicine, but many other disciplines, such as chemistry and physics, are used in the development of an enormous number of technologies which then boost the economy, material wealth, weapons, and means of controlling the rest of the world. These technologies are, I think, essential for the Muslim world. How do we come to terms with this?

Nasr: This is a very profound question. I shall try to answer from a religious and philosophical point of view. Modern science is what I call a Faustian science in the sense of Goethe, that is, the result of bartering your soul to the Devil to obtain knowledge of the world and power over it. And that is why this science has run havoc upon the Christian view of the universe. Although it appears to be neutral, it is not really so because people interpret it as a kind of philosophy in itself. Hence the scientism which has dominated

the Western worldview. Moreover, its application in the form of technology, despite its partial successes, is destroying the fabric of the whole world, the environment, and everything else.

For the Muslim world to think that it can gain that power without making that barter with the Devil, you might say, is daydreaming. I do not believe that that will happen. To gain tremendous power with nuclear bombs, for instance, to respond to the bombs of the West, or with laser-guided missiles to answer the laser-guided missiles of the West, may be politically expedient but to say at the same time that it is an Islamic laser-guided missile is a fallacious assumption and it is against the truth of Islam to make such a claim. The reason is that this whole enterprise of modern science is based on the forgetting of the spiritual dimension present in nature, that is, cutting off the Hands of God from His creation.

Even if an individual scientist may be pious, philosophically speaking, the spiritual dimension does not come into any of his physical observation or calculations and is irrelevant as to how that scientist looks at the world of nature as a scientist. Thus, in modern science, the world of nature is studied in abstraction from the Reality of God. Even if there are certain Western scientists who still believe in God, that fact is irrelevant to our present argument. That is why you can have a physicist who is an atheist, and you can have a physicist who is a Catholic, and both can share the Nobel Prize in physics; whether they believe or do not believe is irrelevant to the science that they are pursuing, according to the modern understanding of science.

What the Muslim world can do is related to the ques-

tion that you are posing. I do not believe that by trying to master all the means of power—technology, you might say—you would be able to remain both Islamic and completely independent as a power. We cannot become independent that way. Japan lost the Second World War, and had they not fought the war they would have remained one of the world's major military powers. But at what expense, at what cost? We see now in Japan, fifty years later, what has happened to Buddhism, what has happened to religious traditions in Japan despite the survival of certain aspects of Japanese culture. How atheism and agnosticism have spread there in the recent past is there for everyone to see. Or take China, which can soon become a world power. But is it going to be a Confucian China that will become a world power or some other China—that is really the crux of the matter.

It is of course very difficult to tell Muslim governments, "do not have these weapons", because they want to be strong and defend themselves; a good government wants to defend its people. And yet, if we, who are thinkers, try to daydream, which most Muslim reformers have been doing for the last hundred years or longer than that, if we think that we can master military and other forms of technology of the West without the negative elements of technology and without the materialistic worldview that comes with it, I think that we are betraying our vocation and our responsibility to the community.

We must, first of all, speak out on this matter, even if what we have to say is unpopular. Those who believe in the dreams of all of these reformers, going back to Muhammad Ali Pasha, Jamāl al-Dīn Afghānī, and Muhammad ʿAbduh, and even including Badīʿ al-Zamān Saʿīd al-Nūrsī of Turkey and Muhammad

Iqbal, believing that we can gain that technological power and at the same time remain authentically within the Islamic worldview, are themselves dreaming the impossible. I think what we have to do as Islamic thinkers and scholars is to say that we must preserve the Islamic worldview as far as science and nature are concerned, no matter what the worldly consequences.

Secondly, in the same way that some people in the West are obligated to defend the environment against what modern technology is doing to it, I feel we need to protect our religious as well as natural environment.

Thirdly, we should try to understand the Western sciences and integrate them into an Islamic perspective. And that has to be done at the forefront, at the very frontiers of the sciences, especially physics and within it quantum mechanics, where we can reinterpret quantum mechanics in a metaphysical way. It is the Cartesian bifurcation which underlies the whole understanding of modern quantum mechanics. That makes it so difficult to understand the philosophical implications of quantum mechanics and so difficult to correlate them with Islamic natural philosophy. The same could be said of other fields.

Fourthly, we must try to create islands, as much as possible, within the Muslim world, for the continuation and practice of alternative technologies based on the Islamic view of nature and of science, including the fields of medicine, of pharmacology, of agriculture, and other fields in which it can be done. Let us hope that this madness toward the creation of ever more deadly armaments and all that is going on in this domain in the world, the weapons and so

forth, will gradually die down and somehow humanity can be allowed to plant the seed of a sacred and spiritually authentic science and nurture our true relationship with nature for the future.

Iqbal: I have a short question in relation to some criticism, especially by David King, of your work, and then I want to finish with the question of origins, specifically of cosmological origins.

David King and some other historians have said that you "idealize" Islamic science without defining what you mean by Islamic science. I know you have defined it so many times in great detail, but in this particular review that I have in mind, King gives very specific examples pertaining to your understanding of the history of mathematics. I believe he was refering to your book published during the Festival of the World of Islam.[2]

2. David King wrote a very critical review on Nasr's book in *Journal for the History of Astronomy* 9, Cambridge 1979, reprinted in David A. King, *Islamic Mathematical Astronomy* (Aldershot: Variorum Reprints, 1986), 212-9, in which he states: "[Nasr's] philosophy, coupled with his disdain for Western science and civilization in general, which are in evidence in every chapter, make the work very much a personal interpretation rather than a historical survey... A curious omission from Nasr's chapters on mathematics and astronomy is any serious discussion of the peculiarly Islamic aspect of Islamic mathematics and astronomy.... The three Islamic aspects of Islamic astronomy are, firstly, the determination of the visibility of the lunar crescent at the beginning of each Muslim month, secondly, the determination of the astronomically-defined times of Muslim prayer, and thirdly, the determination of the *qibla* or direction of Mecca. Nasr ignores the first of these aspects completely, and devoted three or four noncommittal sentences of his own to the second and third, which he calls the 'cosmic dimension of the Islamic rites'. Muslim astronomers concerned themselves with the determina-

Nasr: That's right. *Islamic Science: An Illustrated Study*.[3]

Iqbal: I do not know if you have ever responded to this kind of criticism.

Nasr: No, I have not been in the habit of responding to criticism of my books, but let me make two points in relation to the criticism of David King and people like him against my work on Islamic science. David King made a few corrections, especially the misreading of the description of an instrument, in which he was right and for which I am grateful. We were doing this book quickly, for the 1976 Festival of the World of Islam, and those and some other errors which should have been checked crept in. I am grateful to him for pointing out some of these. The more important issue, however, is the whole perspective in which I have studied the history of Islamic science, one which is rejected by him and many other Western historians of science, many of whom are really positivists.

They look at the history of science from the point of view of the foundation of the discipline by Mach and Sarton and people like them, who at the very beginning of the establishment of this discipline, rejected the views that Pierre Duhem had of a non-positivistic understanding of the history of science. As the history of science developed, it became based on the positivistic view of science—it is that which I rejected at the very beginning of my scholarly life—

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tion of crescent visibility and of the prayer-times and *qibla* for over a millennium. This activity and the vast corpus of Islamic literature dealing with it are worth more than a few sentences in a book bearing the title, *Islamic Science*" (212-3).

3. Seyyed Hossein Nasr, *Islamic Science: An Illustrated Study* (London: World of Islam Festival Publishing Co. Ltd., 1976).

and what I had tried to do was to understand what science means within the context of the Islamic intellectual worldview.

As for what I mean by Islamic science, I have made that very clear, even if it is not easy to define in general what science is. If you ask a Westerner what science is, that is a difficult question for him to answer. The best answer was given by a great historian of science: science is what scientists do.

Iqbal: Right.

Nasr: You are a scientist yourself. That is probably the best answer you can give, because if you say, "science is based on this or that particular scientific method…" it does not work for a Kepler or an Einstein; if you say anything else, again there are exceptions. Science is what scientists do. And you might say that Islamic science is what Islamic scientists have done. But more than that, I have tried to situate that science within the total context of the Islamic intellectual universe and relate it to Islamic principles. I think that I have made that clear in my study of the history of Islamic science. But that was not, of course, accepted by Western historians of science for a long time; however, now there are some who accept my view and try to understand the history of science of each civilization from its own point of view.

My criticism of Joseph Needham was based on this same issue. He had a whole team at work at Cambridge University for his monumental work, *Science and Civilization in China*. I was all alone as a young man, but I wrote *Science and Civilization in Islam* as a response to his interpretation of Oriental science. At that time he had just begun to write his monumental *Science and Civilization in China*. He was writing

from the point of a crypto-Marxist Western scientist, which is very different from writing from within the point of view of Confucianism and Taoism. The case of Islamic science is the same, and that is why I tried to respond to Needham and to avoid what I consider to be a mistake, despite the remarkable documentation of Needham's work.

During the 1960s and 70s, I laid out what I think the methodology should be, from the Islamic point of view, for the study of the history of Islamic science in books which I wrote at that time. And now we have a whole generation of younger Muslim scholars, and even Western scholars, in the history of science who are not opposed but in fact are very much in favor of my approach to the subject. There are, of course, still many opponents. I have always respected good scholars in the field such as David King, even though they have not had the spiritual perspective which Muslim scientists themselves had. And that is the whole problem.

When Naṣīr al-Dīn Ṭūsī or Ibn Sīnā wrote about science, they had a particular view of the universe which modern historians of science do not share. Regardless, I always have had respect for objective Western historians of science when it came to the discovery of historical facts and theories. They have rendered a great service by discovering manuscripts and instruments and by presenting this data to the world. What Muslim historians of science have to do now is to develop their own understanding of history of science. Instead of merely repeating what Sarton—who was a great scholar and my own teacher at Harvard—and others have said, they must develop the field of history of science from an Islamic perspective. That is precisely one of the things that I

have intended to do throughout my life.

Iqbal: My last question is regarding the issue of origins. It has two aspects: one is the question of cosmological origins, and the other is the question of the origin of life. This is a great topic in the field of science and religion, and in your book *Islamic Cosmological Doctrines* you have explored three particular dimensions of this question, but modern cosmology does not share that kind of worldview; it is an altogether physical cosmology. So, how do we understand the views of, say, Ibn Sīnā and al-Bīrūnī, in view of the modern discoveries which have provided a large amount of data with the help of modern scientific instruments? In short, what would be an Islamic view of the origins of the cosmos, considering the data that we now have, and how would you compare this view to that of Ibn Sīnā and al-Bīrūnī?

Nasr: I believe that what Islam, or for that matter Hinduism or Christianity or any other religion, teaches about the origin of the cosmos is not at all invalidated by whatever discovery is made in modern cosmology. Modern cosmology is an extrapolation of terrestrial physics, based on the thesis that all the laws of physics that we have studied on the earth apply to the whole cosmos. Beside the fact that this is an extrapolation and we do not really know, for this way of looking at the cosmos excludes any factor which cannot be measured by an instrument and it is, therefore, bound within the measurable world of classical physics, as well as of modern physics and quantum mechanics. The cosmological doctrines of Islam, or any other traditional religion, on the other hand, are based on a total vision of reality, not only of God but also of what we call the angelic or nonmaterial levels of reality which are not at all, in any way, af-

fected by whatever we may discover about physical aspects of the cosmos.

I am very skeptical about taking all these modern cosmological theories that seriously; they change every few years. There is so much extrapolation, there is so much unknown, and what is presented to be the latest remarkable cosmological theory becomes obsolete so quickly because somebody comes up with another little beep in the heavens or something like that, or they redo a certain measurement or calculation and a new theory comes up. Multiple universes, string theory, Big Bang theory, and so on. Since I was a student at MIT, there have been five or six major cosmological theories expounded.

In fact, I do not think that those who theorize about the cosmos on the basis of modern physics and chemistry should use the term cosmology. These are not cosmologies in the real sense. Cosmology means the science of the cosmos and the cosmos is not limited to its material or measurable or visible aspects. Those are parts of the cosmos, but not the whole of the cosmos. I do not take a purely physical cosmology that claims to be a complete cosmology seriously.

What we have to do is to reformulate, in contemporary language, Islamic cosmology that was created on the basis of the teachings of Islam, and then see what modern cosmologists say from its point of view. Furthermore, it is not a question of making facile correlations such as insisting the Big Bang corresponds to *kun fayakūn* or the *fiat lux*, as some Christian theologians say, for soon comes along somebody who says that there is no Big Bang and the whole thing crumbles. Ten or fifteen years ago there was a conference held in Philadelphia between Jewish theologians and

cosmologists concerning the Big Bang. These days, however, there are many cosmologists who do not believe in the Big Bang any more.

I think that the two types of cosmologies—that is, religious cosmology based on a metaphysical vision or view of the universe beginning with the Divine Creative Act, and modern cosmology—should not be confused. They are two very different forms of knowledge and they talk about very different realities, you might say.

Modern cosmology is based on the thesis that any observable phenomenon of physics on the earth which is measurable applies to the whole of the universe; that is, the stuff from which stars are made is the same as the stuff from which you and I, who walk in the streets, are made. That is a very big presumption that cannot be proved scientifically, but it is part of the assumption of modern reductionism and of modern scientism.

I think that what we have to do is to show that the validity of Islamic cosmology has nothing to do with current cosmological speculations. Islamic cosmology is simply another science, another way of looking at things. It is unfortunate that the same word is used for two very different disciplines, very different intellectual engagements. The traditional cosmologies and modern cosmologies which have been proposed since the last century and which are an extrapolation of terrestrial physics deal with very different realities through different methods.

As for the question of the origin of life, I believe—and this is not just what I believe but it is the view of the Islamic intellectual tradition, and is confirmed by the perennial philosophy—all origins have to do

with Being, because everything that exists comes from the Act of Being, Pure Being, if we speak in the language of traditional Islamic as well as Western philosophy, or, more religiously speaking, with what we call the Hand of God as the Author of creation: whatever is created has ultimately the same Author. Now, life is a very different kind of phenomenon on the surface of the earth from the inanimate world, and the idea that the relation between the Author of creation and His creation is only at the point of the origins and that there is no other relation afterward is itself quite a presumption which, of course, Islam does not accept.

The Islamic belief system tells us that the Will of God works through His creation at all times, even in your life and my life, and therefore the origin of life becomes very easy to grasp. It is another creative *fiat*, another descent from the Divine Realm, the introduction into the material world and into the spatial temporal matrix of another form of reality. Therefore, although we try very hard to create continuities between the chemical and the biological, there is not in fact a complete continuity; there is a jump, a quantum jump, you might say. In modern science, where the Hand of God has been cut off from the world, the power of creativity is seen as being within the "material" universe as a kind of immanence, a kind of pantheism, although scientists of course do not use such terms. That is, the power of creativity is taken from God and given to nature itself.

Suddenly we observe a jump from chemicals to a live creature, a jump which scientists seek to display through reductionism as a form of continuity with such sentences as "life is nothing but...", the "but"

usually being followed by the name of chemical and physical agents. When scientists do concede that there is a jump, that jump is taken to result from forces within the world of nature itself. These days people feel comfortable with that kind of explanation. But if you say that there is a transcendent Cause involved in that process, they feel very uncomfortable with that assertion. This is due to the philosophy that is today dominating over the modern world, although there is no logic whatsoever to that way of conceiving things. If you talk about a jump caused by factors from within, rather than from without, this is just as startling and just as remarkable. The same holds true for the jump from life to consciousness, and this is an even greater jump.

Let us now turn to life forms. When you see a bird flying, there is no logic whatsoever to assume that the wing gradually grew out from an organ irrelevant to flight or to assume that the eye gradually developed and suddenly began to see. There is really nothing more absurd in the world, when you think about it. But we want to accept this evolutionary development as certainty and as real science because we do not want to accept the levels of reality that are beyond our world and are also manifested within our world.

There are different realities, different forms, different species, different forms of life, different capabilities, based on the sacred origins of life forms. I, for one, believe that the teachings of Islam, as developed by the three cosmologists about whom I spoke in my book on cosmology—and there are other forms of Islamic cosmology developed by other cosmologists, but these three are the most important though by no means representing all forms of Islamic cosmol-

> ogy—remain as valid today as they ever were.[4] They are very relevant to our understanding of the cosmos and of life.
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> If we were to have really gifted Islamic philosophers and scientists today who are deeply rooted in their tradition, they would be able to integrate facts which modern science has discovered about life into the Islamic perspective, without sacrificing anything theological or neglecting the discoveries of science, for there is nothing that science has discovered qua fact and not merely interpretation and conjecture based on ideological assumptions, that cannot be fitted into the Islamic cosmological teachings about hierarchy of being and of God's Power manifested throughout all the levels of reality down to the physical world.[5]

Iqbal: Thank you very much.

Nasr: *Jazākumu'Llāh Khayran*.

4. Seyyed Hossein Nasr, *An Introduction to Islamic Cosmological Doctrines*, op. cit.
5. Also see chapter six.

4

Islam, Muslims, and Modern Technology

[This conversation took place in November 2005. It continues the themes of the previous conversation, but focuses on technology rather than science.]

Iqbal: I would like to begin our conversation with general questions. What is the role of technology in the making of the physical, cultural, and intellectual space in which Muslims now live? What is the impact of technology on the environment? What should be Muslim attitudes toward technology? Finally, I would like you to compare technologies developed by Muslims during the pre-modern era and modern technologies.

Nasr: In this conversation, technology refers to technologies which have been developed during and after the Industrial Revolution mostly in the West and which have now spread all over the world. There are two very different dimensions to this discussion: one pertains to the actual situation that exists in the world, that is, what is going on now "on the ground"; the other pertains to the question of what we believe *should* go on as far as the Muslim world is concerned. Let me give an example. As I mentioned in our previous conversation, there is no government in the Muslim world today that does not support any

form of technology that brings with it either power or wealth and also what appears as health. No one resists any form of technology that is believed to bring certain conveniences, like the cell phone which has spread like wildfire all over the world and which, studies are showing, has some detrimental effects upon the brain.

At that level, discussing the relationship between Muslims and modern technology is not efficacious in the sense that whatever form of technology comes on the market—and it is usually from the West, and occasionally from the Japanese and a few other peoples who invent new things—if these new technologies are perceived to bring wealth, power, health, or conveniences, they spread very rapidly among Muslims as elsewhere and it is no use talking to them about the danger of their spread with the hope of having any positive influence. But there are other questions which can be discussed; for instance, the destruction of the environment which modern technology is causing.

Then there is the dimension of this issue concerning what should take place. What should be Muslims' attitudes toward modern technology whose negative effects are obvious? It is about this dimension that I wish to say something and this is where the deepest issues lie. If we go on debating whether this or that particular country has or is going to have or should have knowledge of nuclear engineering or certain types of lasers or this or that, this I think is a wasteful effort at the present moment because we, who are supposed to be the intellectual figures of the Islamic world, who are supposed to clarify these issues, cannot do much at the level of action by Muslim governments and companies in relation to technology.

There is, however, something very important that we *can* do, and that is to create an understanding for the future as far as these issues are concerned. We are responsible for creating an awareness of what is really at stake for Muslims when it comes to the adoption of modern technology. And in this domain, in fact, a number of people in the West have a much greater awareness of the dangers of technology than do people in Asia or Africa, who are on the receiving end of modern technology, and this itself is one of the major issues that should be discussed.

In light of these facts, I think we should turn to the problems that modern technology poses for Muslims, not only as ordinary human beings but more specifically as people who belong to the Islamic religion and are rooted in the Islamic worldview; then, we should try to analyze these problems, and, in light of that analysis, we should discuss what can be done, if anything, and what Muslims *should* do.

First of all, it is important to define terms. The word technology comes, of course, from the Greek *techne*, meaning "to make", and is related to the word for art, which comes from the Latin word *ars*, also meaning to make. Both are related to the word *ṣanʿat* in Persian, or the word *ṣināʿah* in Arabic, which we still use in these languages for both technology and art. Quite interestingly, the division between art and technology has not yet come about for us, linguistically and also conceptually (at least for traditional Muslims) as it has in the West, where art is one thing and technology quite another—despite the fact there are some modern sculptors who go to junkyards and put various parts of cars together and call it art. That is a minor matter.

What we have in the modern world is a situation in which technology in the modern sense is itself the immediate source of most of the objects that surround human life, whereas, before the Industrial Revolution, when things were made by hand, the products of arts and crafts surrounded man's life. This is very important to understand. There is a qualitative difference, although the etymological root of the word "technology" is historically related to a Greek term meaning art, it is now used to mean a very different thing.

A very important event took place in the Industrial Revolution that completely changed the nature of technology. Machines were made to be means to create objects for human beings in Western Europe and gradually elsewhere and they soon replaced human beings in many realms. What was the significance of this change? Let us take a concrete example. There were waterwheels in ancient times and complicated clocks created by al-Jazarī and many other Muslims, but ordinary objects of use in the traditional Islamic world as elsewhere were still made by human agents. Moreover, there is a very big difference in the techniques used to make ordinary objects by hand and the ways of modern technology and this difference affects the human soul deeply. Of course, there were always some machines, such as the water clock or the Persian waterwheel in Muslim lands, but these always remained secondary and peripheral. What surrounded life was the product of art (and crafts which in traditional civilizations were inseparable from art and in fact *were* art) and had a spiritual significance. It is very interesting to note that the very complicated machines made by Muslim scientists and engineers were considered mostly for play and amuse-

ment; they were not seen as a means of increasing production or serving economic purposes. This is very significant.

A qualitative as well as a quantitative change thus took place when the Industrial Revolution occurred. A number of eminent Western writers, going back to William Morris and John Ruskin in the nineteenth century and Ivan Illich, Theodore Rszak, and Jacques Ellul in the twentieth, wrote eloquently and profoundly about certain negative aspects of modern technology, works that Muslims should know. Illich wrote a remarkable book, *Tools for Conviviality*, and the French author Jacques Ellul wrote *The Technological Society*. Ellul has recently turned against Islam because he does not understand it, but he has produced some important and profound critiques of modern technology in its relation to the human soul, the human spirit, and human society. I should also mention the popular work of Roszak, *Where the Wasteland Ends*.

In the 1970s, I invited Ivan Illich to Iran and purposefully I organized a session that involved some of the highest authorities of the land who were in charge of various activities which required technology from the department of national economy, the department of industry, and so on. Ivan Illich gave a talk to them on the significance of traditional technologies, which he contrasted with modern technologies. He gave the example of a water closet. He said that if all the people of Asia and Africa were to have the same water closets as do the people of the industrialized societies in the West, that fact in itself would destroy the water system of much of the world. Everyone was shocked. These were all highly educated Iranian administrators, some at the ministerial

level, with advanced degrees from the best Western universities, and precisely because of that they did not have the least notion of what Illich was talking about. We have the same situation in Pakistan, in the Arab world, and in many other Muslim countries.

Now what we must do is to first of all understand the difference between traditional technologies, which were an extension of our hands, senses, and other parts of our bodies as well as our souls and which, like the body, were subservient to the soul, and the modern machine, which dominates over the human being. An example may explain this point: if you were to go to a part of the Muslim world where we still have traditional craftsmen, let us say Iṣfahān, Fez, Damascus, or somewhere like that, you will see a person sitting with a simple hammer and a simple chisel and producing remarkable geometric patterns in stucco, stone, or wood. Traditionally, the know-how and the art resided within the being of the craftsman and the tool was very simple. But if you go to a Detroit factory where they are producing cars, the worker there has very little know-how—he just presses a few buttons. All of the know-how is in the machine.

In a sense, modern technology marks a transfer of human knowledge and art to the machine. And now we have the second step of the same process in the form of the computer, where knowledge in the mind has been transferred to the machine. I have many students who can no longer spell because they rely on a computer to spell for them. They cannot do any mathematics because the computer computes for them, and gradually the computer empties the mind as the machine emptied the dexterity of the hand, the eye, and other parts of the body of the artisan

and craftsman.

That is what modern technology does. Modern technology is not simply the continuation of the Persian waterwheel or some medieval contraption. It changes the relationship between the human being and the means of creating things. Therefore, it takes away from the human being's creativity—it takes away love and devotion to the creation of an object and the spiritual content of work. The only creative part of modern technology is done by the engineers who design the machine. For someone who is designing an aeroplane or a ship or something like that, yes, there is still creativity in that work. But for those who make things, especially in mass production, the objects that are made no longer involve creativity, which is why work in a modern factory and most other places has become so boring and tedious. In fact that is why you have to have long vacations. In traditional societies, you did not go on vacation. Have you ever thought of that? The vacation was integrated into life. Weekends were not necessary like today. Nowadays, many people say 'I hate Monday', 'thank God it is Friday'—this sort of thing. This attitude exists because work has come to be emptied of spiritual content, thanks to the machine.

All of these negative effects on human beings are consequences of modern technology. The first thing we have to understand is that this technology is not neutral. The claim is that if you are good, you make positive use of technology; if you are bad, you make negative use of technology. That is not at all the case. Of course, if you are good and make good use of it, you will not drop a bomb on somebody's head—that part I accept—but even if you go for a drive down the road peacefully, so-called peacefully, this gad-

get, this automobile, is a major source of aggression against nature. Now of course we realize, or I hope we realize, that global warming is destroying many ecosystems and so many other factors of balance, and that much destruction comes from the so-called peaceful use of the automobile. Therefore, it is not simply a question of good or bad use of technology. There is something more involved. Technology itself brings with it a certain technological culture which is against the soul of the human being as an immortal being, and is against the fabric of all traditional societies which are based on the spiritual relationship between the human being and the objects he or she creates. These objects are based on an art that is creative and reflects God's creativity as the Supreme Artisan. God is called *al-Ṣāniʿ* in the Qurʾān; He is the Creator, the Giver of form, the Supreme Artisan, and He has given us the power of creativity which we reflect in our beings because we are His *khulafāʾ*, His vicegerents on earth.

In Islamic civilization there was no line of distinction between art and technology, between the high arts and the low arts, between the so-called fine arts—this terminology is total nonsense from the Islamic point of view—and industrial arts. What is fine arts? All such terms were created in modern times in the West, including "beautiful arts" (the French *beaux arts*, now used in Arabic and Persian as *al-ṣanāʿiʾ al-mustaẓrafah* and *hunarha-yi zībā*), because art as the means of creating objects for use in everyday life was taken away from human beings in the Industrial Revolution and replaced by, for the most part, ugly products of the machine. In traditional civilizations there was a continuous spectrum of creation which was always related to God, from the making of a sim-

ple comb to the composition of Sufi poetry and everything in between; everything was related to God and reflected His quality as the Supreme Artisan on the human plane. Modern technology destroys that relationship. Whether or not the person driving a car is a pious person, who uses the car to go to the masjid to pray or to go to a night club, the destruction of the environment is there and the making and driving of the car—which is a machine—are cut off from the divine prototype of creativity.

Many of us think that the sacred character of life can be preserved simply by saying our daily prayers. I wish it could. But those are simply the indispensable pillars; the rest of life also needs to be made sacred. In Islam every activity has a symbolic and sacred aspect. In agriculture, for instance, when one cultivated the land, the whole process of sowing seeds and cultivation had a spiritual and religious significance; now, with mechanized agri-business, this spiritual dimension of agriculture has been eradicated. The use of animals in transportation necessitated a relationship between the human being and the animal. There is the *ḥadīth* about treating animals well. That attitude is mostly gone, and of course the fact that animals are used less for transportation does not mean that they are better treated. Let us remember how many species disappear and become extinct everyday as a result of the use of modern technology, not to speak of the painful experiments performed upon animals.

The structure of our traditional cities was one of the greatest artistic creations in human history. By this I mean the Islamic urban design, of which we can still see remnants—*al-ḥamdu li'Llāh*, they have not completely disappeared in cities such as Fez in

Morocco, Yazd in Iran, in parts of Iṣfahān, in the parts of Damascus around the Umayyad Mosque, in the old quarters of Cairo, and so on. These urban designs were meant to create a human ambience in which religion, commerce, education, and daily living were all combined and integrated into a whole in which unity dominated over multiplicity. And what we today call amusement, or having fun or entertainment, which is such a big part of modern society, that also was integrated into the general pattern of life. The reason that amusement (including sports) has become such an important part of today's world and treated as an independent reality is that work is so unentertaining and so depleted of the sense of the sacred, thanks to the modern machine. It is so boring for most people that entertainment has to become a major independent event to make life bearable. It has practically replaced religion for many people.

I have said all of these things in order to prepare the ground for Muslims to understand the nature of this technology. We cannot be naïve and think it is simply neutral. It is true that sometimes we have no choice. God has placed me at this time and place in history where I cannot get on a donkey and go to a *madrasah*, as my ancestors did in Kāshān. There are no donkeys here and the roads are long. I have to use a car. God knows in what condition we are in this world. Yet this does not mean that we should be blind to the consequences of the technologies that are involved and adopt every form of technology that comes along just because it is there.

Beside the loss of subtle spiritual elements, some of which I have mentioned and some of which I have not, modern technology is literally leading us to our

death. It is as simple as that. We are witnessing the destruction of the natural environment at a staggering scale and no amount of putting our head in the snow and trying to forget what is going on will solve the problem. If the Muslim world, China, and India really take off industrially and become as industrialized as, let us say, the United States, and have the same rate of consumption as does America, then the whole ecosystem of the world will either collapse or be radically modified. Everybody knows that. Already without having reached that point, numerous places are at the verge of catastrophic destruction—from the coral reefs of Australia to the Amazon forest. Every intelligent person knows these facts, but few want to pay serious attention to them to the extent that they actually change their lifestyle. I think that it is the urgent duty of the Islamic intelligentsia to draw attention to this situation. Today, this issue is, from the point of view of our earthly life, much more important than any other single issue in this world. I am not talking about spiritual matters which from the Islamic point of view are the most important, of course, but of issues such as poverty, economic crises, political oppression, dictatorships, revolutions, all of these things: none of these poses as great a danger as this problem of the destruction of the natural environment, because those things may gradually be solved, whereas if we do not immediately turn to the issue of the environmental degradation caused by modern technology, we are not going to be around to solve anything else unless God intervenes in nature in ways that we cannot imagine—that is in His Will—but from the human point of view, the way we are going, we have just a few years left to completely change the way we live, or else we shall perish.

Most people in the West will say, 'Ah! The solution to this crisis is new technologies to replace old technologies.' It is here I believe that they are completely wrong. What has to be done is to revive the sacred view of nature which is totally opposed to how modern technology views nature. What Muslims have to do first, in fact, is to not employ every new foreign technology that comes along, but only use technologies which have a less negative impact on the environment. Yes, I agree, there are relative benefits in, for example, having factories which do not create as much smoke as before, but that is minor compared to something much more profound, and that is the general negative impact of modern technology upon the environment and upon the souls of modern human beings. Modern technology creates a negative impact, and this impact increases not only tenfold, but up to a hundredfold with many new technologies, so that the more technology we have normally, the more negative of an impact we make upon the environment and also upon minds and psyches.

We have to change our whole way of living. We—and I mean everybody on this planet—have to change in a basic way and think of technology in another manner. This is where the Muslim world can play a positive role. Let me say a few things specifically about Islam. Educated people in the Muslim world want to be technologically like the West, including, unfortunately, even those who are pious and do not like the West, and even those who are so-called 'fundamentalists'. When it comes to technology, they are as Western as the most modernized Muslims. You take the most secularized Turk in Istanbul or from some other city, and the most fundamentalist Muslim preaching in some mosque in Saudi Arabia; their at-

titude toward technology is probably the same, which is a remarkable comment to make when you consider their very different interpretations of the Islamic worldview. That has to change. Muslims have to realize what we cannot and should not do in this realm. While there is no choice for a Muslim community in having or not having telephones or electricity, let us therefore not talk about things which cannot be done and technologies that cannot be avoided, even if we realize their negative aspects. Let us talk about things which can be done.

The Islamic world can still preserve many things. First of all, in the field of agriculture, for instance, genetic engineering is a dangerous practice to be avoided if possible. In countries like Pakistan and Iran, which have major agriculture sectors, we must strive to preserve traditional agriculture as much as possible; and it is possible to preserve the traditional modes of agriculture production by keeping small farms, rather than changing the whole method by adopting large agro-businesses, using genetically engineered seed, taking over traditional farms. These agro-businesses are hardly the hope for providing food for the whole globe, as is usually advertised.

Secondly, it is possible to preserve much of the traditional urban designs of Islamic cities and the technologies which affect human relationships, modes of transportation, and the use of energy. The preservation of traditional Islamic architecture and urban design can play a major role in preserving something of traditional technologies and a saner way of life. We must not be like a sleepwalker who accepts whatever comes along without even thinking about its consequences. Just to take the case of cell phones that have spread like wildfire over the

earth in the last twenty years. Now we even have people circumambulating the Kaʿbah while their cell phones are ringing—this is a blasphemy of the worst kind that you can imagine. These cell phones have so many negative medical and psychological effects when they are used indiscriminately, but many Muslims are just blindly following the trends that originate in the West. But the irony is that in the West, at least a small number of people have their eyes open, whereas the Muslim world is blindly copying whatever comes from Western technology. Even those who are against the West have a deep trust in Western technology. They think that whatever technology comes from the West must be good. We need to have a greater sense of discernment in this matter. That does not mean that tomorrow morning we can stop having anything to do with modern technology. Some people in England have recently created small villages which are completely pre-industrial, with natural agriculture, natural water, and so on. Alas, I do not think that many in the Muslim world would envisage such a thing at this time unless it be for tourists.

There are, however, many wise choices which we can still make and are not making; for example, in the use of traditional technologies in making objects such as carpets, cloth, utensils, traditional irrigation systems, the traditional use of energy in relation to architecture, and so on and so forth. More generally, I believe that we must do everything possible in the Muslim world not to allow our tradition of making things in an artistic way to be totally destroyed. The weakening of this tradition was one of the major results of the impact of colonialism in the nineteenth century, parallel to the destruction of our scientific

tradition and of much of our educational system. The arts have not been completely destroyed, but they have suffered a great deal.

Let me give you an example: the Persian carpet is a very important element in many homes. It is true that for the most part its dyes have become chemical, imported originally from Germany, since the 1920s and 30s, but carpet-making still remains a traditional art form. It is woven by artisans and has a spiritual significance. The carpet plays a very important role in traditional Islamic society because we sit on the floor, pray on the floor, eat on the floor, sleep on the floor. A carpeted space becomes the living room, the dining room, the prayer room, and the family room where everyone sits together in the small traditional home, which is the case for the majority of Muslims. In many places, say, in a village in Afghanistan, many have one room where they do everything. The same is true in Iran, Pakistan, Morocco, and other places.

We must not allow the traditional carpet to become the industrialized carpeting that we have in the United States, even though such an industry makes money. Unfortunately, some carpet factories have even come to Iran, which is the most important country for the making of carpets. We have to prevent such destruction of the traditional crafts to the extent possible, and this is an instance where the preservation of traditional technologies is possible if there is the will. We have to try to preserve the making of hand-woven cloth. A lot of the things that Gandhi said that everyone scoffs about today, even in India, where he is the father of the nation and yet nobody wants to listen to what he said, were completely true. Once you destroy the recycling-based economy of 100,000 Indian villages, what is left of

India? The same holds true for us.

The wonderful hand-woven cloth still made in Morocco or Algeria or in Muslim India, where exquisite *saris* have been made for centuries, is there, although industries associated with weaving have also suffered, but many other arts, crafts, and traditional technologies have been destroyed in the central lands of Islam; much has been lost. In certain parts of the Islamic world, however, traditional methods of production continue, and these should be strengthened rather than lost. The governments should try to help in this task of preservation. There are projects like this in Jordan, in Yemen, in Morocco, in Iran, and other places. Muslims should try to expand the production of traditionally produced objects not as luxury items, so that you can buy a vase and put it in your living room as a so-called piece of art, but as part of daily living. Your grandmother and my grandmother took a cloth to go to the public bathhouse once a week, as almost all men and women did in those days—those pieces of cloth were all woven by hand, and many of them are in textile museums today.

It is remarkable how the quality of life has gone down, and not up, with modern technology. The clothing, the bowls from which people ate food, the quality of the food itself, its fragrance, and everything else has gone down as far as quality is concerned. So, we should try and preserve these islands, these sectors of human life in which the traditional technologies still survive. Such technologies are combined with art, with a meaning in the making of things, with the spiritual satisfaction of the person who makes them, the inner satisfaction of the person who consumes them, because there is something directly hu-

man and at the same time spiritual in the production of handiworks, even if it be a simple comb made by hand.

Titus Burckhardt has a wonderful story in one of his books on Islamic art that a simple-comb maker narrated in Fez, Morocco. He told of how this art was first taught by God to Seth, the son of Adam, and has a spiritual significance. If you go to the bazaar and buy a simple comb made by hand, you feel the difference between it and the one produced by the machine. Even an American tourist feels it. In Western society with its high technology, something made by hand is considered to be valuable and not inferior. People pay a lot more money if something is made by hand, whereas in much of the Muslim world things have been going in the reverse direction for the last hundred years. Machine-made objects are considered by many to be better than hand-made ones. We can, however, reverse these trends. This can be done. The reversal of this trend has to go hand in hand with the intellectual critique of modern technology along the lines of first dealing with its cosmological/spiritual aspect and second its impact upon the environment, both natural and human.

In response to this point of view, it is often said that it is impossible to go back to those technologies which cannot produce massive quantities because our needs have increased manifold, because the number of people on this planet has increased tremendously from the pre-Industrial Revolution era. This is true to some extent in certain fields, but not all. For example, let us take the big cities of India, where women still wear *saris* made by hand. Today there are about 500 million of them. Two hundred

years ago there were probably 100 million of them; a 1000 years ago 50 million of them. It is true that the consumers have increased from perhaps 50 million in the Middle Ages to 500 million now, since there are now a billion Indians, out of which approximately 500 million are women. But the number of people who can produce cloth have also increased. Thus, if one has a somewhat simpler life, and the fact that there are more people who can produce things which are made by hand, then even though consumption has increased, one can still maintain equilibrium. This is one of the fallacious arguments (supposedly on firm economic basis) that is given to create a consumer society.

A consumer society consumes a lot more than it needs. It feeds upon the creation of false needs, which is driving the world to its annihilation and always the argument is given that more people need more things. That is not necessarily true, because when you have more people, you also have more people who can produce simpler things and do not always need machines. In fact, the sudden explosion of the world population is itself a product of modern technology, for medical technology is a part of that technology; there is no doubt about it. Modern medicine is a double-edged sword. It saves many lives but it is also indirectly destroying the world through making possible over-population and the greater impact of human beings on the natural environment. They all go together. Right now, if there were a billion of us on the surface of the earth rather than six billion and a half, this catastrophe—that several species have already disappeared from the surface of the earth just during the forty-five minutes that I have been speaking to you—would not have occurred. We

are indeed facing a catastrophic situation.

So, it is true that we now have a much larger world population, but we also have a much larger population to produce simple things, as I gave the example of hand-woven *saris* in India. This could work for many other objects. For example, Iran now has a population of over 70 million people. Just a generation ago we had 35 million people; population doubled in a period of 30 years. That means that the usage of Persian carpets has more or less also doubled. That could be the pretext, and it was something that many in the government said both before and after the Iranian Revolution, that we have to bring in machine-made carpets because the population and its needs have increased. But the people who make the carpets have also increased. In fact, in villages in Iran today, you can see that there are lot more people making carpets than there were thirty years ago. Appropriate government policies can help a great deal in such situations. I am not saying that it should be done in every case, but in many cases, efforts should be made to preserve the qualitative relationship to production and to consider happiness in life not as having more and more, but in valuing what one has while providing for basic necessities.

This is a very challenging matter because many people will criticize me and say, "Oh! You are against wealth. You are against this, you are against that." No, I am not. There have always been poor people and rich people and nowhere has there been a greater difference between the rich and the poor than in highly industrialized societies such as America and Britain today. In any case, the human collectivity—six billion people—cannot together have the so-called standard of living (which is a dangerous

statement but is made all the time) of the highly industrial nations of the world. The earth cannot support that. And despite all of this modern technology, far from destroying poverty, the modern world has made poverty much worse in cutting man away from nature. Look at the difference between the rich and the poor—there are few places on earth where the difference is as great as in the United States, where the head of a company makes over ten million dollars and the janitor in the same company makes ten thousand dollars a year. This pattern is very common here. It is in many ways worse than the difference between the maharājas of India and their subjects during the rule of the Rāj. This is one of those very fallacious arguments that are given by economists of communism and socialism on the one hand and capitalism on the other. All claim that they will make people richer and destroy poverty. Now this is possible to some extent but not completely. You see what has happened in practice. Those countries which have modern technologies, the North, look how different their life is from those who do not. And the idea of chasing after this technology in the so-called underdeveloped world is of course based on the fact that you are always receiving the bread crumbs of someone else who has eaten at the table, and this so-called chase is not going to improve matters. We have to change the way we think about this issue.

We need to think of poverty and wealth in other terms. Let us take a village whose inhabitants live close to nature, have natural water, have good clean air coming from the mountains, deserts, or forests. They do not have to have all of the wealth of the city of New York in order to be happy. That is not the case. They might be just as happy as are New Yorkers

although being much less wealthy and they certainly live in a more beautiful ambience than those who live in the slums of New York. We need to rethink our whole attitude towards happiness, towards poverty. Of course, no government can refuse food or clothing or water to its citizens, I am not saying that. Modern technology could of course help these things, but the fact is that most modern technology is associated with greed; it is associated with modern capitalist economics, which is based on greed, and you have seen its consequences. We do not have to go into that matter here but we should not blindly accept such arguments that modern technology is the only means to a happy life. The Muslim world can, perhaps, do a better job if it can control greed, if it can control the negative elements, and have a better distribution of wealth, as the Qurʾān teaches us. That it can do if it remains faithful to Islam. But that does not mean that it has to forego the intimate relationship between human beings and the means of production, while trying to have economic justice. That is the whole issue.

Coming back to the main point, that is, what the attitude of Muslims should be toward modern technology, let us first analyze this matter somewhat further than what I have already discussed. This is a very complicated question. The Muslim world encountered the modern West in a situation of a power struggle; that is, the West invaded the Muslim world and Muslims tried to understand how it was that they were being dominated. They thought it was modern Western technology, science, and managerial organization which allowed the West to colonize them. And power brings with it a sense of respect, unfortunately. There is a beautiful Arabic saying, "*al-insānu*

ʿ*abīd al-iḥsān*", "man is the servant of virtue". But there is also the axiom "*al-insānu* ʿ*abīd al-qudrah*", that is, "man is the servant of power". This is human nature. And the Muslim world, seeing the power of the West, just as did the Chinese and the Japanese worlds, began to have a sense of servitude, obedience, and awe, combined with an inferiority complex toward the West, from the nineteenth century onwards: attitudes which are still very much with us.

Although over the past fifty years many voices have spoken very strongly against this inferiority complex (and, *inshāʾaʾLlāh*, it will gradually diminish) it is still present to a large extent. This inferiority complex does not only involve technology; it is a subset of something larger, that is, the attitude towards the whole of Western culture's organizational strength, its political and economic power, and so forth, although not, strictly speaking, its religious thought. Even among the most Westernized Muslims few would say, "Christianity is superior to Islam because that is the religion of the West." But in other domains the inferiority complex remains.

There is, however, one very important mistake that has complicated this discussion. Muslim society has tried to reassert itself during the last half century, or a bit earlier, but certainly since the Second World War, and has tried to redefine its own identity. Many people have said, "We are no longer mesmerized by the West, its philosophies, its this or that, but what the West has that is positive is its science and technology. We are against modern Western culture, but technology is neutral, and we want to adopt it." The supreme case of this way of looking at things can be found in what happened in Saudi Arabia between the 1960s and early 90s, a period during which the

most extensive transfer of Western technology to a Muslim country took place. The Saudis became very docile in the acceptance of Western technology, as if it were totally neutral despite their outwardly rigid interpretation of Islam. This attitude, although it is a subset of a larger problem, is in fact a new problem that is even more dangerous because it is based on an illusion of the worst kind, and that is that modern technology is culturally and ethically neutral. It is not. It is culturally bound. And it cannot be separated from a worldview that affects man's understanding of himself, of the world around him, not to speak of God and the spiritual world.

But there is some hope. Let me turn to the subject of Islamic architecture and design, which are so deeply related to traditional technologies. In the early 1970s, in the city of Iṣfahān, I organized the first conference ever held on traditional Islamic architecture in modern times. I brought Hasan Fathy, the famous Egyptian architect, from Cairo to Iran. We helped publish his book *Building for the Poor* and Fathy's style has now changed the whole area around Lake Fayyum in Egypt. The rekindling of interest in traditional Islamic architecture in general and the work of Hasan Fathy in particular began to take off to a large extent from the Iṣfahān conference, and it became a turning point of sorts. From about the early 1970s, a number of Muslim architects and city planners began to realize the significance of what in Persia we call "*bāft*", that is, the texture of the Islamic city, meaning not only individual buildings but the urban design itself. My own former students Nader Ardalan and Laleh Bakhtiar wrote a book, *The Sense of Unity*, which analyzed the urban design of Iṣfahān and other places on the basis of the idea of Divine

unity, the integration of various functions of a city, and the cosmological and theological significance of urban design.

Since that time, thirty some years have passed. One of the things I did along with others, was plant the idea in the mind of the Aga Khan to give an award for architecture which now has become very famous. Although the Aga Khan award, I believe, does not only deal with buildings that are built only on Islamic architectural principles, it gradually grew out of the ideals of Islamic architecture and then came to also include other buildings. Its concerns have remained in any case mostly Islamic. This program has helped to draw attention to the importance of Islamic architecture and of the urban design of Islamic cities, which are a very important part of Islamic civilization and culture and includes traditional technologies.

Now, what can be done? As I already mentioned, the first thing to be done is to preserve what has not yet been destroyed in architecture as well as traditional technologies in general. All those areas of cities such as Tehran, Lahore, and Cairo—where people infatuated with Western models have demolished beautiful traditional quarters to make big boulevards which are extremely hot during the summer and have destroyed the whole environmental context of the city and all of these things—cannot be resuscitated anymore; nothing can be done to undo this destruction, at least in the short term. But there are quarters of some of these cities which are still partly traditional, like the area around the Wazīr Khān Mosque in Lahore or the Grand Bazaar of Tehran or of course the old Fāṭimid and Mamlūk Cairo. The first thing to do is to prevent these areas from being further

destroyed by having big streets run though them, or building tall structures which would destroy the texture of the area along with traditional technologies associated with architecture. Some of this has been done, thank God. This is one area where things are better now than before. Can you imagine that in the 1970s the mayor of Fez wanted to cut a big boulevard across the middle of the city? Fez is the largest urban area in the world which has no cars in it. It was Titus Burckhardt who helped save the city by going to UNESCO and getting a commission to save Fez and finally speaking with the King of Morocco so that they stopped the plan. Nobody today would think of doing such a thing in Morocco. Things have improved a great deal in this respect. So the first thing to do is to preserve those areas which we still have in many of our countries, especially the smaller cities—for example, Aleppo, Kāshān, and Yazd—those magnificent cities in Syria, the central and southern parts of Iran, and also in Morocco, the whole of Yemen, perhaps Hyderabad in Sindh, some of the Indian cities, and so forth. This is the first thing to do, with the attitude that many of the traditional technologies are precious and should be preserved to the extent possible.

The second step, and this has also been taken to some extent, is for our architects to try to be inspired by this traditional Islamic urban design and architectural technology and forms in the designing of new houses, towns, and villages, rather than simply using Western designs. I was very happy to see that a few of these traditional designs have been implemented in even Saudi Arabia, a country which destroyed so much of its old architecture so rapidly, as well as in Iran, Egypt, Morocco, and elsewhere; of

course such architects are still a minority voice, but this trend continues, and is in fact growing. Now, I accept that it is not possible in the big capitals of the Muslim world; you cannot undo what has been done to Istanbul or to Cairo. But for the smaller cities, I think, it can be done: many great cities of the Muslim world still have areas which have traditional Islamic architecture or urban design: Damascus, Istanbul, Iṣfahān, Mashad, Lahore, even Delhi—much of which is really an Islamic city because it was ruled by Muslims for so long—Cairo, and of course the cities of North Africa, which are exceptional in the preservation of their *medinahs*. All of these can still be preserved along with traditional methods of building and repair.

A new generation of architects has to be trained to carry out this task. Right now there is only one school of traditional architecture in the Muslim world that gives a degree in traditional Islamic architecture. That is in Jordan. Until a few years ago, there was just the Prince of Wales Institute in London. There is still no other university, as far as I know, in the Muslim world which grants a degree in traditional Islamic architecture and design. When we have a "school of architecture", it is based on Western architecture. So, we have to start changing by having more schools of Islamic architecture. The same is true for medicine; we have to teach Islamic medicine and pharmacology in medical and pharmacy schools, to teach their philosophy as we should teach the philosophy of Islamic architecture and design. What is important in architecture is to understand the principles of Islamic urban design, not only its external form, and the same holds *mutatis mutandis* for medicine.

For example, in the planning of the city of Lahore—which was one of the most beautiful cities in the world when I first saw it in 1959, and when I saw it thirty years later I was flabbergasted by the sprawl! It was one of the biggest shocks of my life—Islamic architecture took into consideration local natural and social conditions, traditional technologies, as well as metaphysical and cosmological principles. Muslim architects knew that the climate of Lahore is not the same as the climate of Yazd, nor that of Tangiers; so they took everything into consideration: climatic conditions, the social fabric, social dynamics, and so forth. But above all, these cities had something common in their design: they were all based on certain metaphysical principles related to the nature of reality, cosmology, and the relationship between the human being and God from an Islamic point of view.

These principles are now gradually being studied by younger Muslim architects. This type of study has in fact made a lot of progress in the last few decades. For this, we owe a great deal to the writings of Titus Burckhardt and a few others, and perhaps some of my own humble writings which I wrote to try to explain the cosmology and the philosophy behind Islamic art and architecture along with their related technologies. But we also owe a great deal, of course, to the few architects such as Hasan Fathy, and then the younger generation of architects—people such as Abdul-Wahid al-Wakil and Umar Faruq in Egypt and Sami al-Anghawi in Saudi Arabia, who have tried to apply some of these principles. In this domain, I am more hopeful than I was thirty some years ago when I organized the conference in Iṣfahān. Let us hope that, *inshā'a'Llāh*, this will continue and that in-depth critique of modern technology will en-

able Muslims to preserve at least something of their traditional ambience, which was always permeated with the presence of God and was also in harmony with the natural environment. Let us also hope that Muslims will gain a deeper awareness of what modern technology entails and develop a more discerning attitude toward it, not only in architecture but also in other fields.

5

On the Environmental Crisis

[This conversation was recorded on February 19, 2007 in Edmonton, Canada. It brings into sharp relief various aspects of the contemporary environmental crisis. Tracing the historical background of the present crisis, it proposes solutions based on the Islamic concept of the natural world and human responsibility toward the world of nature. It also discusses the role of Muslims in dealing with the crisis.]

Iqbal: Perhaps we should begin by defining what we mean by the environmental crisis; in fact, we should talk about "crises" rather than "crisis", for we now have multiple dimensions of this issue about which you have written so extensively during the last fifty years. We could begin by pinpointing various dimensions of this crisis, for what is generally called the "environmental crisis" is not merely the crisis of the environment; it involves both the natural world as well as the microcosm within us. There are integral links between these dimensions. We have even corrupted the food that we consume! Then there is the role of science and technology in the making of this crisis. Could we, then, begin with definitions and then go on to details?

Nasr: When one talks about crisis, it means of course that things are not in a normal state but in one that is

dangerous and in disequilibrium. If everything were in crisis all the time, there would be no crisis. For example, if you have waves at the edge of the sea, you do not say there is a crisis because you have waves all the time—but if you have a tsunami, then there is a crisis.

A crisis already implies that a normal state has been disrupted in a dangerous direction and manner and that we are aware of what has happened. Otherwise it does not appear to us as a crisis. When we speak of the environmental crisis, therefore, we mean that a crisis in this sense has been created in the natural environment, one that has upset the balance and harmony of the natural world which has surrounded and nourished human beings for as long as they remember, as long as history records, as long as they have lived on this earth. Not that there was no contention or strife between man and nature before, not that ten thousand years ago when man was becoming agricultural, that shift had no impact on the natural environment, but such shifts did not create a crisis for there was a remarkable ecological harmony which continued. Had there been a crisis of the dimension we have now at that time, it is most likely that we would not even exist today.

There is a remarkable harmony in the workings of nature, in the coming and going of seasons, in the alteration of cold and heat, in winds and calm air, in oceans and deserts, in how animals and plants exist together. Now what is called the environmental crisis is a "crisis" because, as a result of modern technology and its applications driven not only by need but also greed and the creation of artificial needs all over the globe, that balance and harmony have been destroyed. This is obvious; it can be observed in the

extinction of many species and in the destruction of their natural habitats. Global warming—about which everyone is now talking—is, in fact, only one aspect of the environmental crisis, but it is so acute that it has finally caught the attention of everyone, whereas other aspects, especially the loss of species, has more or less been neglected by most people. As long as their cats and dogs are around, ordinary people do not realize what is happening to the diversity of life forms in the natural order.

Of course, now, this pollution of the world of nature has entered into the food chain, into our bodies—through chemical and bio-technological technologies as well as the air that we breathe and the water we drink. This process has become so widespread and "normal" for many people that they do not even recognize it as yet as a crisis, because they do not feel its full impact upon them until someone they know falls seriously ill or dies due to causes obviously related to the pollution of the environment. Otherwise, even most of those who think that there is a connection between all kinds of cancers and various chemicals which have polluted our internal environment through the corruption of the food chain do not seem to be concerned enough to take any serious action, there being of course some notable exceptions.

Some people at least now recognize that we do not have any knowledge of the long term effects of bio-agricultural or bio-engineered agricultural products, and we should not, therefore, assume these products are safe to consume, without having any knowledge of what consequences they will have on human health in the long run. But few listen to such reservations. So the environmental crisis, in a sense, involves both the external natural environment and

also the inner natural environment within us, within the human body, which in itself has a remarkable harmony, being a marvelous microcosm which is in a sense a part of nature, while also complementing the external world, the macrocosm. Needless to say, the crisis also involves the "landscape" of our souls and not only bodies.

Iqbal: You have mentioned in many articles that there is a relationship between modern technology and the environmental crisis, that modern technology has a great deal to do with the emergence of this crisis and the destruction of the natural world, and just now we have spoken about bio-engineered food that enters our bodies; can we go back into history and pinpoint the emergence of this dimension of the contemporary crisis? This is important because there seems to be a time gap between the actual appearance of the crisis and the realization of its existence.

Nasr: We are always faced with a delayed reaction: days have already grown longer since December 21, the middle of winter, but we experience that the earth is receiving more heat from the sun only many weeks after the actual lengthening of daylight hours. This is how it is with historical events. The environmental crisis began with the Industrial Revolution, but since the Industrial Revolution was carried out in only a small part of the globe, predominantly in the Western world—in England, the middle of New England, and in certain parts of Germany—and it then spread to other places, therefore its environmental impact was not initially felt worldwide; it was local.

This does not mean that it went unnoticed; many writers and poets were very sensitive to the ugly ambience created by environmental pollution. Charles Dickens, for instance, writes about the contrast be-

tween the beauty of the vales and dales of England and Scotland which were not touched by the new industries and those parts which were turned black by industrial development. However, that did not prevent the spread of Industrial Revolution, because of what the new technologies seemed to offer and also because of man's greed and the new possibilities that science and technology provided for governments and influential persons and organizations seeking wealth and power, as well as what appeared as its capability to eliminate human suffering. And it took a long time for the negative effects of the modern industrial processes from causing a crisis that would be recognized as such by the public at large. If the rest of the world had not participated in this process of modern industrialization, it may even have taken a longer time, perhaps many centuries, maybe even millennia, for those few places on earth that were industrialized to have a serious and strong impact on the total ecological conditions of the globe. But this is not what happened.

In fact, one sees from the nineteenth century onward the spread of these new technologies to other parts of the West where they had not been present at the beginning of the Industrial Revolution. Agriculture in many parts of Europe was still traditional in the early part of the nineteenth century. But soon, the technologies created during the Industrial Revolution spread into all parts of the West and then into the non-Western world, such as the Islamic, Indian, Chinese civilizations. This transformation led in a most amazing way to the industrialization of Japan, resulting in the growth of its economic and military power combined with the pollution of its environment. Its military power was destroyed by the

Second World War but its economic power has continued to grow remarkably. Let us not forget what role this Japanese industrialization has had on the destruction of forests as far away as Malaysia and Indonesia. Such has been the result of the adaptation of these technologies by non-Western societies where such adaptation has been successful. But the rest of the non-Western world, the three major civilizations—Indian, Chinese, and Islamic—and also non-Islamic Africa and much of South America did not participate in this process until quite late. It is only in the last fifty or sixty years, during the last half century—except in a few large cities where modernism came earlier—that the impact of new technologies is being felt globally. We need only to look at present-day China.

Iqbal: Now we are in a very advanced state of the crisis. You have pinpointed its beginning at the time of the Industrial Revolution and blamed modern technology (in combination with the new image of man that developed in the West, the man who carried out the Industrial Revolution) as its major cause. But it seems to me that this crisis was inevitable, because we could either have the pristine world of the pre-Industrial Revolution era and no Industrial Revolution or the Industrial Revolution and the destruction of the natural habitat. They come together, in a package, and there seems to be no choice here: technologies produced during the Industrial Revolution were inevitable, so to speak. They had to be invented for the kind of change that was then taking place in the Western world; there was no other way. And of course, once invented and made operative, these technologies could not but destroy the sanctity of the natural world. Of course we cannot now go back in time, so could there have been another way? Had there been

this kind of awareness, had there been more awareness about the impact of these technologies on the natural world, could we have avoided the crisis?

Nasr: I do not believe so; as soon as the concept of nature changed and nature became a secularized mass, just an "it", and what I have elsewhere called "Promethean man" was born, there was bound to be this destruction. I do not think that if wiser economists had sat around in Boston and London and planned things differently in the eighteenth century, the crisis could have been avoided, because this kind of planning is not strong enough to be a dike against the greed of human beings and the avariciousness which this technology accentuates and makes possible. I believe that this battle was lost the moment nature became secularized, the moment the Hands of God were cut off from nature. After that change, man no longer felt any responsibility for nature. Nature served only as a source of materials; it could be dominated and used for whatever purpose and in whichever way without having any rights of its own. I wrote in my book *Man and Nature*[1] that in traditional societies, nature was seen as one's "wife", but the modern West turned it into a "prostitute".

Iqbal: I want to now draw this conversation toward this nexus between the concept of nature—the environment both within us and outside—and the present crisis. You have written extensively about this nexus in *The Need for a Sacred Science*[2] and several other works—this concept of nature and the removal of

1. Seyyed Hossein Nasr, *The Encounter of Man and Nature* (London: George Allen & Unwin, 1968), reprinted as *Man and Nature: The Spiritual Crisis of Modern Man* (Chicago: ABC International, 1997).
2. Seyyed Hossein Nasr, *The Need for a Sacred Science* (Albany: State University of New York Press, 1993).

the Hands of God, as you have often called it, from the equation. Where is the turning point? Where is the beginning of a real change? It seems to me that not many people are interested in looking into this matter in any depth; the vogue is to keep measuring levels of carbon monoxide. Calculate this or that value, discuss percentages and ratios, talk about the reduction of greenhouse gases and the like, but there is seldom a discussion about this aspect of the crisis which you have pointed out so many times. Let us, thereafter, go into the concept of nature in Islam and the responsibility of the Muslim world.

Nasr: Yes, I will be glad to do that, but first I want to make a comment upon what you said. It has been nearly fifty years since I began to write on this subject. It has been over forty years since the appearance of my *Science and Civilization in Islam*,[3] and my book on cosmology[4] which was based on my Ph.D. thesis at Harvard and which was published a few years after I received my doctorate degree. So, I was aware of this crisis even as a young scholar and thinker, long before I became established as a well-known scholar. When I gave the Rockefeller Series of lectures at the University of Chicago in 1966, later published as *The Encounter of Man and Nature*, and since then reprinted several times and translated into many languages, I was deeply conscious of this crisis. That book addresses this question explicitly. What I had said in that book, which predates the other works you have mentioned, is that the environmental crisis has deep spiritual, philosophical, and religious roots

3. Seyyed Hossein Nasr, *Science and Civilization in Islam* (Cambridge: Harvard University Press, 1968), reprinted (Chicago: ABC International, 1999).
4. Seyyed Hossein Nasr, *An Introduction to Islamic Cosmological Doctrines*, op. cit.

and causes. It is not merely the result of bad engineering or faulty economic planning. It is the underlying causes that need to be addressed, but—as you said—unfortunately most people do not want to listen to this matter, especially in modernist circles, because if you accept what I have said, then you have to change the paradigm that dominates over how modernized human beings live today. That is something that no one wants to do. Of course, I do not literally mean "no one", for there are always a few courageous souls who want to bring about a radical change based on principles, but by and large most people are not willing to change the way that they live and think.

I do not believe that any cosmetic change can cure the crisis; it is as if a cancer patient is dying of cancer and you put powder on her face so that she looks pretty. That is not going to save the patient. We need a deep transformation of our understanding of nature and of the human state, of who we are, of what our relationship is with God and the natural environment which is His creation. And all of this implies a radical change in the worldview that dominates much of the globe today. We need to reexamine this dominant view of nature and of man, not only in the West, but also in the Muslim world, where people are still tied to their faith but, as far as nature is concerned, most of them have lost its traditional understanding and are just aping what is happening in the West.

Iqbal: There is a practical aspect to all of this, especially in relation to the Muslim world. You walk into Tehran, Cairo, or Lahore today and the whole city is like an immense parking lot. The number of vehicles on the road, the pollution, the quality of air—it is impos-

sible even to breathe. Yet, the practical aspect of this situation is that people need to have the so-called modern means of transportation; the structure of contemporary society has become so dependent on these technologies that one cannot even imagine cities without cars and other motorized vehicles. So what you are saying may sound to many people like an idealistic approach to a very real-life situation. People would criticize this position and say, "Well these are good dreams, pious words, but what do we actually do?"

Nasr: I wish they were only dreams. It is like a ship or a boat that has a hole in it—like the story of Moses and Khiḍr in the Qurʾān.[5] In the Qurʾānic story Khiḍr makes a hole in the ship. Moses, who is accompanying him on this journey, does not recognize the deep significance of this action. Had there been no hole, the ship would have gone directly into the hands of the wrathful ruler coming to snatch all good boats and everyone would have been killed. Likewise, it is absurd that anyone who proposes a real solution to these problems which implies a change of direction rather than plugging holes here and there is a dreamer. While anyone who wants to apply cosmetics is seen as a practical person. I do not accept that at all.

It is true that we have to take some immediate practical measures such as having more public transportation, using natural gas rather than petroleum, and so forth. The quality of air in Istanbul has improved incredibly during the last ten years. Istanbul used to

5. *Al-Kahf*: 71-75. The name Khiḍr is not mentioned in the Qurʾān, but tradition gives this name to the "*'abd*" mentioned in the Qurʾān who was given a special kind of knowledge by Allah.

be like Tehran or Lahore, but now you can see blue sky in the middle of the day, just because of this one action of the government: the change of the type of fuel used by cars. Such actions are all well and fine, and one should do what one can along these lines, but that is not going to solve the problem in the long run. Such actions are going to give us more time in which to try to really solve the problem. So I am in favor of all immediate solutions on a technological or economic level, but I do not believe that is going to solve the crisis if we insist on pursuing our present course.

Iqbal: So, ultimately, the solution would emerge through a change in our view of nature itself?

Nasr: Yes, exactly. Our view about nature itself and of human life, of what responsibilities we have. As Muslims we know that we have a responsibility toward God so we do not eat bacon for breakfast. That is fine and very important. But our responsibility toward God is not limited to what the *Sharīʿah* bans in our dietary regimen. It also involves a responsibility toward His creation, and creation is not only man. One of the greatest tragedies of modern times, which made modern technology possible, is the anthropocentric humanism of the Renaissance era, which makes man the measure of all things. Man is in the center of this new system of thought or worldview, not God. This secular humanism changed the views of people about themselves and about all things, from a theomorphic to a anthropomorphic or anthropocentric perspective, and, therefore, now everything revolves around man.

For example, when the Industrial Revolution began in the West, why was no attention paid to technology's impact upon plants or animals which were dy-

ing, or to rivers that were being polluted? The reason given was something like the following: "Our efforts are serving man. Human beings are now better off; they are less sick and not hungry", and so forth and so on. And so the earthly welfare of man became the absolute criterion for all action and the welfare of the rest of nature was totally disregarded. This kind of selfishness is a modern phenomenon. Modern people usually like to say, "well, man has always been like that." Man has not, however, always been like that. In traditional societies, there were parts of sacred mountains where no one would even climb, even if they needed wood from there. In this regard, I often give an example that shocks many people in America. I say, look, every night a large number of people in Delhi die of hunger, but you have all these cows wandering around the city. All they would need to do is to take one of the cows, kill it, and for days the whole street would eat meat. But they do not do such a thing.

The idea that human beings have always been like that, have always sacrificed everything else for their own use and well being, is not true. It is simply not true. But no one wants to face this reality. So what we have to do is change the way we look upon things. First of all, modern man has become accustomed to enjoying life only if there is continuous consumerism. I do not mean everyone, but most people. And now the East is learning to be a good consumer society. If you are a Turkoman even today, in the Turkoman Sahra in Northern Iran, you have your family, a tent, a few beautiful carpets, and your sheep, your horses, and your goats and you are happy with the small things in life as well as with your husband or wife and your children, not to speak of the pristine land

and starry sky around you and above you. If you have enough sheep that give milk and you can feed your family you are happy. But now in the big cities, what is it that makes us happy? Craving endlessly for more and more material things.

Technological innovation without thinking of its consequences is the murderer of nature. Of course, less polluting technologies will help; I am not denying that. What people such as Al Gore and others are saying is correct to a large extent. There are technologies which can reduce pollution, but I do not believe that those technologies alone will save us from this crisis. We have to have an inner transformation. We have to have another way of looking at ourselves, at the purpose of human life, at what satisfies us, what makes us happy, and not turn over to consumption as the only way to be happy, seeking satiation of our never-ending thirst and satisfaction of endless wants that are then turned into needs.

Iqbal: I would like to now move the conversation towards Islam and Muslims, but here is the dilemma: the environmental impact of modern technologies is no longer local—everything has become globalized; it affects the entire globe. So, even if Muslims were to change, that would not produce a solution to this multi-dimensional crisis now in its advanced stages. But even to assume that Muslims would change is too much; in fact, the Muslim world is fast traversing the same path as the West, and perhaps more blindly. So, even though we can say that Muslims should have an understanding of the sacredness of nature because of their beliefs, the ground realities are very different. Even if we were now to concentrate on the Muslim world and the environmental crisis, can we say there are solutions which Muslims can adopt in

their own traditional lands that will produce any significant results?

I say this because you are suggesting a fundamental shift in our view of God and nature and that, I think, may be very difficult for the general populace in the West. It may be asking too much from a non-Muslim to change his or her views about God and His relationship with humanity and nature. What you were saying about the nature of the change that took place in the West during the Renaissance is, after all, a significant historical development that has affected the course of Western civilization to such an extent that to ask for such a radical change—the kind of change you are suggesting—is to ask for a total re-orientation of the belief system—from a homocentric to a theomorphic, and that may be too much. This is why I am saying that it may be easier for the Muslim world to recognize the roots of the environmental crisis, for it would not involve such a huge step for them. Muslims already have a certain set of beliefs which they partially apply in their lives—for instance, not eating pork—and perhaps it is easier for them to take the next step and understand that the natural environment is sacred and has rights upon them, just as they respect laws regarding eating, they can admit that there are certain laws regarding the natural world as well and respect them.

Nasr: First of all, it is very interesting that although this disaster came from the West, it also produced awareness about its impact first in the West. The environmental movement is much stronger in the West than in the Muslim world. I teach here in America, and I have also taught in the Islamic world. There are a lot more young people in my classes here in America who relate to this subject than there would be if I

taught the same course in the Muslim world. Right now, I am teaching a course entitled "Man and the Environment", and there is a lot of interest among the students. If I were to teach a similar course in, say, Pakistan, there would be far less interest. There is no doubt about that fact.

That is however a paradox, for the Muslim world is still not that alienated from its own traditional understanding of nature. The West in general (and of course not every Westerner) has been removed from the way of looking upon nature as God's creation imbued with sacred character for four or five centuries now. And even before that, in medieval Christianity, there was not as much religious emphasis upon nature as in Islam. There is no sacred scripture that speaks about nature as much as the Qurʾān. The Qurʾān even takes the various entities of the cosmos as witnesses, and speaks about how they glorify their Creator, *yusabbiḥū mā fiʾl-samāwāti waʾl-arḍ*;[6] (*whatever is in the heavens and earth glorifies Him*). This and many other verses tell us that everything worships God, praises Him, adores Him, *waʾl-najmu waʾl-shajaru yasjudān*.[7]

To destroy any species or for that matter creatures in general without a reason condoned by God is to destroy voices that reach God in hymning His praise. Our literature and philosophy are full of this truth. Persian literature is replete with verses reflecting this truth; many people know them by heart even today. Saʿdī (1184-1283 or 1291) and Rūmī (1207-73) wrote about this, as did so many others. I do not want to quote Persian poetry here, but you know this

6. *al-Ḥashr*: 24.
7. *al-Raḥmān*: 6; *The stars and the trees bow in reverence before [God].*

well, as your mother tongue is Urdu which also is replete with verses reflecting the same understanding of nature. In Turkish, Yunus Emre (1238-1320) has many beautiful verses on this subject, as has much of Arabic poetry. It is part and parcel of our Islamic culture. In fact, in order to succeed in becoming completely industrialized, the champions of industrialization and modernization are destroying these aspects of that culture. We are negating much of our heritage. Many reformers in the Muslim world thought that in order to reform the Muslim world and in order for it to come out of its current position of weakness, Muslims had to turn against their own traditional culture—a culture that was imbued with love of nature in a spiritual sense.

In almost all languages spoken in the Muslim world, there is a very rich tradition of love of nature in poetry and in aphorisms which deal with this subject. And there are also explicit commands in the Qur'ān and *Ḥadīth* about our treatment of God's creation. Then there are the works of Muslim philosophers and Sufis on the philosophy of nature. I have written so much about this matter that I feel I should put the pen aside and let others take up the task, *inshā'a'Llāh*. But we have to resuscitate this tradition which has only recently been partially forgotten. This heritage can be revived much more easily for us than the Western tradition for contemporary Westerners.

Governments, of course, do not want to pay attention to this matter, even when they are paying lip service to Islam, because they want to become masters of modern technology as fast as possible for political, military, and economic reasons. And they say, "why did the West 'develop' at the expense of

spoiling and polluting nature? We want to do the same." This view is, of course, catastrophic, because while the West was doing those things, the rest of the world was not going through such drastic changes. The jungles of the Amazon, Indonesia, and Malaysia had not yet been destroyed. The lung of the earth was still functioning. But now, if the rest of the world wants to industrialize at the expense of the natural world as did the West, if you want to turn the Amazon jungle into what the Europeans did to the forests of Europe centuries ago, the ecological balance of the earth will be destroyed.

Iqbal: That is so true.

Nasr: It is as simple as that. But non-Western governments such as those of India, China, Indonesia, or Malaysia will not listen. I think that deep down they think, "It is not really our responsibility—the Westerners did what they wanted, and in the process became rich and powerful and were able to dominate us; now it is our turn." This is what creates a lethal combination, a very dangerous situation for humanity as a whole. And the West, which was the first civilization to desecrate and pollute the natural environment and which plundered much of the wealth of Africa and Asia for centuries, is not going to say, "well, we will give you your wealth back; please do not do what we did because it will endanger us." That is not going to happen. To see this matter clearly needs a certain amount of wisdom, which, as far as I can see, no government in the Muslim world possesses at the present moment.

Iqbal: Are you speaking of practical steps to be taken by governments of the Muslim world?

Nasr: I am speaking of the wisdom to forego certain false notions of power and domination, of mindless acquisi-

tion of modern technology, and so forth, for the sake of having a safer, saner, and healthier society in the future. As I said in our conversation on Muslims and technology,[8] there are many alternate technologies that we can use to reduce the impact of our activities on the environment. For instance, in the Muslim world there is still some possibility of and hope to preserve our traditional way of agriculture. When I was a child growing up in Tehran, all the agriculture in the countryside was traditional. They used oxen driving a simple wheel to crush wheat and so on, and everything was based on human effort and animal energy or energy drawn from nature such as falling water and wind. There were no industrial machines; there were no tractors or chemical fertilizers. Now, of course, chemicals and tractors and so forth are fast destroying the whole traditional method of agriculture throughout the world in the name of increasing productivity and for economic advantage. But this is a wager that we may lose.

We cannot even be sure of long-term productivity, not to speak of the rate at which the soil is being depleted and chemicals are entering the water system. There are many things that the Muslim world can do without threatening the health of its populace, by clinging to and reviving traditional technologies. But as I said, I see no government in the Muslim world—whether they are leftist or rightist, republics or monarchies, secular or Islamic—that is paying attention to this question at a serious level.

Iqbal: So the only solution that remains possible, then, is to increase this awareness, this consciousness, this wisdom that you talked about, through some kind of intellectual effort at the level where it may create

8. See chapter four.

a pressure group or slowly increase awareness in the general public. But here is the dilemma: you talked about the Qurʾānic revelation so intimately connected with the concept of sacredness of nature, but our *ʿulamāʾ* themselves do not write about it anymore! We do not hear *ʿulamāʾ* linking this crisis to the lack of Islamic practices which require that we respect nature and do not violate its rights. They speak about moral decay, of course, of degeneration of values and the erosion of ethics, but hardly ever speak about the decay of the environment and our plunder of nature in terms which are Islamic, which belong to the sciences of religious law. The environmental crisis has become a secular debate, as if Islam has nothing to do with it.

Nasr: That is a major problem. We have had one or two *ʿulamāʾ* aware of the environmental crisis such as Shaykh Aḥmad Kuftāru, the late grand Muftī of Syria. He used to give wonderful *khuṭbahs* in Damascus about the environment. But, in many places, even to talk about the environmental crisis becomes threatening to governments. Many governments discourage this kind of discourse. They do not like this issue to be discussed publicly and they crack down on those who bring it to public forums. Therefore, the only thing to do, the only possible strategy, as you say, is to increase awareness by whatever means at our disposal. Let us not forget that this whole process of the secularization of nature began with a few people in Europe. Only twenty or thirty people started it in Europe; if they had all been removed from the scene at the time, we would not have the present situation now.

The rise of this modern paradigm of nature in Europe is due, at its beginning, to just a few people.

From those few, it gradually seeped into the rest of the society. As the Latin adage states, *corruptio optima pessimi* (the corruption of the best is the worst), or *māhī az sar begandad nay ze dom*, as it is said in Persian, that is, "a fish begins to stink from its head, not its tail". We can now do the same in reverse, that is, have a truly intellectual and spiritual elite (*khawāṣṣ*) in the traditional sense, who are fully aware of the crisis and who can then influence the larger public. This elite group would of necessity include some *ʿulamā*ʾ.

The effort to change minds in the Muslim world needs to be carried out on two different levels. First of all at the level of the learned who are "opinion makers". We need to increase awareness about this issue among people who deeply understand both the modern world and Islam. They can then in turn transform the minds of the general populace. Secondly, at the popular level, we need to have more small action groups, people who are committed to protecting the immediate environment without necessarily understanding the deep philosophical issues involved, people who can begin organic farming, plant trees, and take other measures and small-scale steps to protect the environment around them, as we see in England already.

There are also a few such groups in the Muslim world, such as certain circles in Egypt which have established eco-villages, though unfortunately these are mostly for tourists. Nevertheless, it is a beginning. This year when I went to Egypt, I did not have time to visit one of these oases based on traditional farming and technologies, but I was told that in these eco-villages, everything is environmentally safe; everything is done in a traditional manner. There is

no electricity; they use candles for light, that sort of thing. I do not want to imply that such practices can be carried out for the whole of Egypt, but they can be very important models for developing saner ways of living. I think Prince Charles visited one of these villages last year. He is a great champion of environmental issues, a person who understands the deeper elements that are involved. But the irony is that these villages in Egypt are mostly for foreign tourists, not for Egyptians! This fact itself is very disturbing. Nevertheless, we are talking about increasing awareness among various people. There has to be more local action for this purpose; ironically, there is a lot more local action in the West in this domain than there is in the Muslim world.

Iqbal: So, practically speaking, there is the need for increasing awareness about the environmental crisis at two levels and to concentrate on local action.

Nasr: Yes, but this has to be complemented by yet another action that is ultimately far more important—namely, the education of a group of people who are environmentalists and also hold a view of nature that is rooted in Islam. It is this group that may have the same kind of impact on the Muslim community as a whole as those people had on the Muslim world who went to the West, say a hundred years ago, to study medicine and engineering and returned to India, Turkey, Iran, or Egypt to start the process of Westernization of those societies, except of course the impact of this action would be in the reverse direction.

Iqbal: In a way, we are now speaking of a process we discussed in that other conversation we had about modern technology and its impact on the Muslim mind. You had said "we must not be like sleepwalkers who accept whatever comes along without thinking about

its consequences".

Nasr: Absolutely. I have spoken about this matter before, but the principle that should always be kept in mind is that just because something is there does not mean you have to use it, even if it is attractive. It is as if you go to a restaurant and there are all these different enticing dishes, but you cannot eat all of them; you have to eat what is good for you if you want to remain healthy. We have this tendency now to devour whatever comes along, because of the economic pressures to buy and sell—of course, whatever is made and invented, the makers try to sell it to us at all cost. And we are at the end of the receiving line, and therefore the pressure is there to buy and participate in the whole cycle of economic activity without having the choice to act wisely. This is indeed very unfortunate.

Let me give you one example regarding building materials about which Hasan Fathy, the great Egyptian architect, always used to speak. By using our own mud, bricks, and stone and all the other traditional materials that we have, we can create remarkable architecture which is also very environmentally friendly. So, instead of the metals that are so extensively used today in buildings, we can use natural materials in many instances. Nature abhors metals, we do not see metals in their pure metallic state in virgin nature. Rather, we see them as compounds, with the exception of a few inert metals such as gold. If you ever go and see all those wonderful buildings in northern Pakistan, you will never see metals. Of course, metal existed before modern times, it was available.

People talk about the Iron Age. The first signs of metallurgy of iron has been in fact found in the

Iranian plateau and later in China, going back thousands of years, but the actual usage of iron was on a small scale. Traditional people did not have an environment dominated by metals. Once you have an environment that is full of metals, whether it be aluminum, iron, or steel, you have already created an ambience that is totally alien to nature, and then nature becomes alien to you.

Iqbal: Let us now focus on the inner environment—the crisis within us. We began by mentioning this crisis, mostly produced by chemicals and genetically modified products that we have started to consume, and you also just mentioned the greed and the pressure to sell. I was astonished to see genetically modified fruit coming from the northern areas of Pakistan—a region where farmers have grown traditional crops for centuries! Even such remote areas are no longer safe. The delicious apricots of the Hunza Valley are no longer delicious. Farmers are changing the ways of their forefathers. They are all turning toward genetically modified products, which are like sugar-coated edible synthetics, and they are doing this for the lure of higher yields and money.

Nasr: I have seen this happening all over the Muslim world. This is a global crisis. When Theodore Roszak wrote his famous book in such beautiful English, *Where the Wasteland Ends*—which, in fact, in many ways echoes my book *Man and Nature*—he said that the pollution of the environment is a kind of eleventh hour externalization of the pollution that is within us.[9] There is no doubt about the truth of that assertion. If we were all reinvigorated spiritually, our attitude to-

9. Theodore Roszak, *Where the Wasteland Ends: Politics and Transcendence in Postindustrial Society* (Berkeley: Celestial Arts, 1989).

ward everything would change, including ourselves in relation to nature. That is why simple cosmetics and good engineering will not in themselves solve the environmental crisis. But the fact that the apricot growers in the Hunza Valley are changing their methods is because there are people in the big cities of Pakistan who are advocating this sort of thing. First of all there is a change in the thought process in big cities where people begin to see the cultivation of apricots merely as an economic activity. Then they come across these newer methods, developed in the West, which promise higher yields without regard for quality, and they bring these techniques to the Hunza Valley—to people who would not have changed anything otherwise. They would have had no knowledge of mechanized agriculture. They are in a sense innocent. It is the people who have the knowledge of these methods resulting in greater economic gain without the least regard for quality and who introduce these things to the far corners of the earth in order to make more money who are guilty. They are the ones who are responsible.

And why are they responsible? Suppose you are the agriculture minister of Pakistan or some official in the ministry, and your duty is to increase apricot production; if you do not, you will be kicked out. So, to keep your job you do not care what is going to happen to the quality of fruits from the Hunza Valley. You just want to keep your job and make good money and have your wife go to parties at night and so on. And so, to achieve your goal, you find experts in the new methods of agriculture, people who are in a sense even more responsible than the minister or his equivalent in some company for the negative changes taking place.

All these elements are tied together—new technologies, political systems, economic systems, and social structures—to affect the way things are changing. Knowledge brings power and the way to change things is also through knowledge. Those who have the correct knowledge of what is going on, who also practice what they preach, can bring about positive change. I know, for example, that in certain parts of the world farmers are being taught to preserve their own traditional methods by those who have more authentic knowledge and also more power than them. In India, for instance, there is a strong movement to preserve traditional agricultural methods and preserve trees.

It is quite amazing, really amazing, since this movement was initiated at the local level mostly by a few women. It is not impossible to do something. First of all, if a person like you were to go to the Hunza Valley and tell the farmers there that, first of all, your product tastes like sugar-coated plastic and in the long run nobody is going to buy it, they would listen. Secondly, they need to be told that this type of farming is going to ruin the soil. In five years they will be poor, because nothing will grow on their land anymore. They would be working in some bazaar in Lahore. They will again listen. The simple peasants and farmers of the world are in fact the least greedy of all the people involved in this process.

Whether it is in South America, Pakistan, or anywhere else in the so-called developing world, the situation is more or less the same. There is a movement going on today on the basis of creating awareness from above and thereby influencing ordinary farmers, builders, and others. The journal *Resurgence* published in England, and the Schumacher School

in Devon, England, can be given as examples. As I said, there are also attempts to build environmentally sound villages that preserve traditional agriculture and traditional architecture using much less energy than modern villages and towns. On this level we in the Muslim world need to learn what is going on in the West and to some extent in India and even recently in China.

Iqbal: Yes, we mentioned this paradox at the beginning of our conversation: there is more awareness in the West about the environmental crisis than in the Muslim world, although the crisis originated in the West. It is hard to comprehend why Muslims would remain aloof to such an important issue.

Nasr: You know what many leaders in the Muslim world say about it—it is really comic, comic and tragic at the same time—they would say that the West has gone through a full circle; the West started the environmental crisis through industrialization, and now in this post-industrial society they have come to the realization of the existence of the environmental crisis and there is now some awareness of this matter; once they follow and complete this cycle, then they will do the same. They do not realize that the earth will not allow that, that God will not allow such a thing.

Iqbal: This reminds me of 1995, Islamabad, when you delivered that wonderful keynote address at the International Conference on Science in Islamic Polity in the Twenty-First Century and the President of Pakistan set aside his pre-written speech and spent forty-five minutes telling us while your words and vision were beautiful, they were not practical; the Muslim world needs to acquire modern technologies and so on.[10] But, let us set that aside for now. You just

10. For the text of this keynote address, see chapter seven.

mentioned the eleventh hour, which reminded me of Martin Lings' *The Eleventh Hour*[11] and the connections between cosmic history and the environmental crisis. If we are indeed living in the eleventh hour and the cosmic cycle is going to close, then the environmental crisis has yet another dimension. For Muslims this awareness of the coming of the Last Day brings a certain amount of urgency for action; I am thinking of the saying of the Prophet, upon whom be peace, telling us to plant the seedling in our hands even if we see the Hour coming.

Nasr: Exactly. I have spoken about this matter in several places. But there is another side to it as well. There are people, both in the Muslim world and in the West, Muslims and Christians, even Jews and Hindus—in fact people everywhere—who are the most adamant opponents of the environmental movement, who in the case of Christians believe that Christ will soon return to earth and all non-Christians will be destroyed, and God will rejuvenate His creation. By this they mean we should not worry about the environment now and go on drilling in Alaska and let the wildlife refuges be destroyed. As you know, this is a very powerful movement in America. In the United States, paradoxically, many of the most devout and active Christians have until recently—though they are now changing somewhat—been indifferent to what is happening to the natural environment, while the secularists have for the most part been insisting on the preservation of the environment; everything has become reversed, in a certain sense.

In the Muslim world it is the same. There are people awaiting the coming of the Mahdi. In Iran, in Iraq,

11. Martin Lings, *The Eleventh Hour* (Cambridge: Quinta Essentia, 1987).

in certain regions of Africa such as Nigeria and West Africa, there are people who believe that very soon the Mahdi will appear, and they look at eschatological teachings only from the human perspective. They think that oppression and injustice will soon be overcome and so forth. They do not look at the world of nature at all, whereas the Qurʾān and *Ḥadīth* teach us that our duty toward the world of nature does not change whether we are living in the eleventh or the first hour, in the same way that our duties toward God and ourselves do not change. For example, we cannot commit suicide because the Mahdi will soon appear; because the committing of such an act was, is, and remains against Islamic law. We do not get up in the morning and say our prayers with the eleventh or the tenth hour in mind. There are certain duties which God has placed on our shoulders which we have to perform irrespective of into which moment in history we are born.

The Hour is in God's Hands, and we do not know what God's plans are. We do not know when the Mahdi will come. The Prophet, *ʿalayhi al-ṣalātu waʾl-salām*, said that whoever tells or predicts the Hour is a liar—the Hour, meaning the *Sāʿah*, when time will come to its end and *al-Qiyāmah* comes. We do not know when the world as we know it will end, and we have to live our lives in concrete time, in the duration in which we exist, and we should live according to the *Sharīʿah*, by praying and fasting, as if life will go on.

We have to do the same vis-a-vis the world of nature. God has made us His vicegerents on earth, *khalīfatuʾLlāh fiʾl-arḍ*, with a responsibility to protect His creation at all times, including the eleventh hour. There is no way of escaping that responsibility; it is

the duty of our *ʿulamāʾ* to increase this awareness. We have in fact to educate a whole new generation of *ʿulamāʾ* who will be aware of these matters. All they have to do is to read the verses of the Qurʾān or study *Ḥadīth*—they can be totally indifferent to what al-Rāzī or Ibn Sīnā said or what Ibn ʿArabī wrote about these matters, but they cannot ignore the Qurʾān and *Ḥadīth*, which are so explicit about the environment.

Let us recall the Qurʾānic references such as *mufsidūna fiʾl-arḍ* in *Sūrat al-Baqarah*, that is, the corrupters of the earth, in reference to the creation of man. Now, this term *mufsid* is often interpreted as having to do with injustice and oppression, but most of all it means corruption, what we are doing now; for we are literally corrupting the earth. And God says to the angels *I know what you know not*. That is, there is another aspect of man as *My khalīfah*, *My vicegerent on earth*. If we do not fulfill that function, then we are not God's vicegerent on earth; rather, we are trying ourselves to take the place of God, *astaghfiruʾLlāh*.

Having forgotten their vicegerency, today men are trying to act as gods, and they will be punished in the most severe way for this sin. I have always said that however powerful we may appear to be as we try to destroy nature, nature will have the final say. Nature has direct contact with God; it is not responsible for us or to us. It is we who are responsible for its protection, because of the function that God has placed upon our shoulders. He has given us intelligence, free will, and other powers which we must use rightly, always remembering that we are His vicegerents. We are not "our own man", as the Americans would say; we are God's man. And in the same way

that God makes the sun rise and set every day, we must try to preserve the harmony of nature instead of destroying it.

Iqbal: *Jazāka'Llāhu khayran*.

Nasr: *Wa'l-salāmu ʿalaykum*.

6

On Biological Origins

[This conversation took place on September 22, 2006 in Edmonton, Canada. It deals with some of the most important issues concerning the origins of life. It challenges the generally-accepted Darwinian and neo-Darwinian theories from metaphysical, philosophical, and scientific perspectives and proposes alternate explanations based on the Qur'ānic worldview.]

Iqbal: There are two basic issues involved in the question of biological origins: the origin of life as such, and the special form of life that we call human life. A huge amount of data has been gathered over the last two centuries in biological sciences which has been interpreted from various perspectives, the dominant view being the evolutionary process which stipulates that life originated in small-cell form and then became more complex through random processes in which only the fittest forms survived. Some theists have inserted God into this process to develop a form of evolution which is often called theistic evolution, and there are some of Muslim scholars who also subscribe to this idea of theistic evolution. Of course, no Muslim would say there is no Hand of God involved, but they put the Hand of God into a form of Darwinian process, generating a great deal of confusion.

Nasr: There are few issues today as important for discussion

and as insidious in their implications as this theory of evolution. First of all, let me say that I have studied not only physics but also geology and paleontology at Harvard, and so it is with this background that I reject the ordinary understanding of the Darwinian theory of evolution even on scientific grounds. Let me say that at the very beginning before turning specifically to the Islamic point of view. This theory of evolution is the tent-peg of modernism; if it were to fall down, the whole edifice of modernism would collapse. It is, therefore, kept as an ideology. It is not a scientific theory which its defenders claim to have been proven. I know that this very statement will be rejected by many people, but Muslims at least have to look upon this whole issue from this point of view.

There are different kinds of scientific theories. For example, you have string theory in physics and cosmology and you have quantum mechanics. Now, if someone were to oppose prevalent theories in these fields, no one would expel that person from his or her university; no one would have his or her promotion denied because of his or her saying "I do not accept this theory." Evolution, on the contrary, is a totally different matter, because it is an ideology, it is not ordinary science; if you are a professor of biology at a university, especially in the Anglo-Saxon world—less so in Italy, France, and Germany—and if you oppose the theory of evolution on purely scientific grounds, you are rejected and even ejected from your position, your colleagues think you are insane, you do not receive promotions, and so on.

Muslims have to approach this issue in light of the status that evolutionary theory occupies in the modern world. And they have to look upon it both from that point of view and the point of view of its scien-

tific claims to explain certain scientific phenomena. Now, I am not at all in agreement with a number of Muslim scholars, for whom I hold a lot of respect in other fields, in their having succumbed to this pressure and have developed what you might call an Islamic version of theistic evolutionism or evolution. First of all, this is worse than the Darwinian idea of evolution because it is no longer even scientific and would not satisfy the agnostic or atheistic biologists. Secondly, it ties the Hands of God through a process that we believe we know, but we really do not know. And that is even worse. So Muslims have to look upon this issue from the point of view of our own spiritual and intellectual positions—from what the Qur'ān and *Ḥadīth* say, what our intellectual tradition has said. There are major issues involved, which the modern mindset glosses over, leaving evolution as the only explanation of the scientific data.

One of them is the question of form and the finality of form. A triangle is a triangle, and nothing evolves into a triangle; until a triangle becomes a triangle, it is not a triangle. So if we have three loose lines that gradually meet, even if there is one micron of separation, that is not a triangle. Only a triangle is a triangle. And life forms also have a finality of their own. The famous French biologist L. Bounoure opposed evolution on the basis of this reality of the finality of forms, as well as other considerations.

The traditional idea of form (*morphos*) has lost its status and essential meaning in both Western philosophy and Western science. The only thing that survives is mathematical forms which themselves are abstract forms. But concrete forms were thrown out of science by Galileo and Descartes. Once you quantify science—and say that science is the quanti-

fied explanation of things—you can no longer deal with forms which deal with the quality of things. The form of an orange, for instance, you cannot study it in modern physics. What you study is, in fact, the weight of the orange, its sphericity; or in chemistry the amount of acid in its juice, its molecular structure. What then happened to the orange? You do not study that concrete form itself. So the first question is the question of form and what it means in relation to the theory of evolution.

Secondly, there is the question of creativity, and here we get into deep theological issues. In Islam, two of the Names of God are *al-Ḥayy* and *al-Muḥyī*. God is both Life and the Giver of Life. And no one can get around that truth and say that God created the dinosaurs like this or that, but at the same time say that the dinosaurs were produced by certain environmental conditions and that they developed later into this or that animal.

Let me repeat that in Islam God is both Life and the Giver of Life, and that for me is something very clear and true without being unscientific. First of all, life is not reducible to non-life. Secondly, God is also the source of all existence, whether alive or not alive, and for that reason also anything that exists cannot be reduced to non-existence by us. Matter can be turned into energy and energy into matter, and there might be black holes in the universe, but what we cannot do in a laboratory is to reduce something to nothing or nothing into something, because God is also *al-Bārī*ʾ and *al-Khāliq* and He is the Giver of Existence. Firstly, God gives existence, and secondly, being Himself Life, *al-Ḥayy*, and the Giver of life, *al-Muḥyī*, He gives us life (*al-ḥayāt*). He is the source and bestower of all forms of life. In the same way

that no other power in the universe can bestow existence except the Source of existence, no other power in the universe can bestow life except the Source of life. Therefore, we must reject from the Islamic point of view the accidentality of the origin of life.

There are three basic elements to consider: one, the destruction of forms in the ultimate sense; two, the reduction of causality to the horizontal plane—that is to say, the denial of Vertical Causality and therefore Divine Causality; and third, the horizontalization of the vertical chain of Being.

It is meaningless in modern science to say that forms of creatures exist in, you might say, the imaginal or subtle world, in the world above this material world and that at a particular moment in the history of the material cosmos they are crystallized—which is really what the Islamic point of view asserts—crystallized in accordance to the Will of God and His knowledge and always in accordance with the conditions that God has set for a particular cosmos. That is why apple trees do not bear pears.

But that is not the same thing as evolution. When the spring rain comes, all of the seeds which are under that particular plot of land behind your house begin to come forth and flower; that is not the evolution of those seeds, except in a very different meaning of this term. It is like our evolution from the foetuses in our mothers' wombs. That is, however, another meaning of evolution and not the transformation of one species into another; that is not what is happening to the seed. Rather, the potentialities within the seeds in the soil are actualized. That kind of idea goes back to Augustine in the West and before him to the Stoics, and we also see it in the writings of

many Muslim thinkers. We can see it in the cosmology of Ibn Sīnā and others have written about it. That is true, but that is not evolution, as understood in the Darwinian sense. In modern evolutionary theory, the vertical axis, which would explain why certain forms appear in the material world, has been horizontalized and therefore it is only through the matrix of time and matter that modern science understands the genesis of anything, including living forms.

Iqbal: So, is there no possibility of any kind of evolutionary process which would transform one species into another?

Nasr: There is the possibility of micro-evolution, but not of macro-evolution. Micro-evolution is still within the possibilities of the archetype or form of a particular being in the philosophical sense, in the same way that you and I are human beings, and the Chinese and the Japanese are also human beings. Our eyes are one way; their eyes are another way. If we migrate to Zimbabwe, our skin grows darker; if we go to Sweden, it would grow a bit lighter. But we are all within the possibilities of the human form. That kind of micro-evolution is possible. Flies can become a bit bigger and when there is a certain kind of light, plants can do this and that, and this is mistaken by some for change of species. That is not change of species; that is "evolution" within a single species. Each species has a width, a range, a reality greater than a particular individual in that species. And so other individuals can appear in that species with other characteristics and even change according to environmental conditions, without one species becoming another.

As Muslim thinkers, you and I have to pay attention to all the critiques that have been made of evolution-

ary theory in the West itself. And by this I do not mean only the religious or the theological. First of all there is the biological critique. There are many biologists, such as G. Sermonte and R. Fondi, the authors of the book *Dopo Darwin* in Italian, meaning "After Darwin", and many others such as G. Monastra also from Italy and many in France and Germany who believe that Darwinism has prevented biology from developing and that it does not accord with biological data, that what appears in the paleontological record is a revolution that takes place, not an evolution. Even if you do not want to talk about where new living forms come from, you observe that species always appear suddenly and that is why they call this thesis in French *la révolution organiciste*, the organacistic revolution, if we want to translate it into English.

There are many biological critiques made of the theory of evolution by European biologists who in the Anglo-Saxon world would usually have been ostracized and marginalized. This is true of a person such as Douglas Dewer, who was a member of the Harvard faculty. As soon as he began to criticize Darwinian evolution, he had to publish his book in Tennessee, rather than in Cambridge, Massachusetts. I am referring especially to his famous book *The Transformist Illusion*. Since then, two generations have passed and little has changed as far as biology departments in this country are concerned. Many others have written on this subject since then such as Michael Behe, the author of *Darwin's Black Box,* who is having difficulties with his colleagues. A purely biological criticism can be made without denying micro-evolution, without denying adaptation of species to new ecological conditions, without confusing a species with

variants within that species. If you and I go to northern Canada among the Inuit, either we adapt to the new environment or we die; there is no doubt about that fact. It does not take great intelligence to understand this truth.

Secondly, there is the question of logical criticism. How could something greater emerge from something lesser? This criticism is answered by modern biologists and most scientists in general by denying the greater, because it is qualitative; this is done through reductionism. By reducing the great prophets and saints as well as little mosquitoes to simply molecular structures, evolutionists think that they do not have to talk about the greater coming out of the lesser. But if they think about it for a moment, how could the greatest works of literature, since we are speaking in the Western language, such as those of Dante or Shakespeare, come out of a bowl of soup of molecules? They do not want to think about it in these terms, as though in a long stretch of time these molecules just happened to get together to finally produce *The Divine Comedy*. But from the point of pure logic—and also taking into consideration the fact that logical formulae and logical concepts do not themselves evolve—there is a constancy in logic, both in mathematical logic and formal logic. One can easily make a logical criticism of the prevalent understanding of evolution based on reductionism.

Thirdly, the type of criticism that is very important is the theological, in the sense that the scientific worldview separates what it studies of the world of nature from all that is Divine and then considers this truncated reality to be the only reality. Now for the traditional theologian or the man of religion or the philosopher of religion, there is no way that biology

can destroy his view of Divine causality. There is no way that biology can disprove that there is "Vertical Causation". No theologian can deny that God said, let there be light and there was light, that He created birds, the phyla of birds. So the theologian, who has not himself succumbed to the allure of evolutionism, can always criticize and critique the biological evolutionary point of view by pointing to the reality of the Divine Cause in the created order, and the fact that creative power belongs to God alone and not to matter, as the Qur'ān also makes clear.

It must be noted however that unfortunately many Western Christian theologians have already surrendered to evolutionary theory. Afraid that Christianity would be attacked by defenders of a materialistic and quantitative science, they have tried to devise all sorts of theories associated with what is called theistic evolution which, as I just said, is even worse than the purely biological theory of evolution, because that cuts the Hands of God from His creation in a theological sense while claiming to believe in God. Furthermore, if these theistic evolutionists do consider God's role, their views do not satisfy scientific evolutionists anyway. Muslim theologians must criticize not only biological evolution but also the Christian, and by that I mean the modernistic Christian, theological understanding of biological evolution.

Fourthly, you have the question of mathematics, the mathematical critique of evolution, the critique that has already been made by a number of mathematicians including all these people who speak of intelligent design. Although they have been very much attacked by evolutionists, they have recourse to this mathematical argument: according to the mathematical theory of information, you can never get

out of box "A" more information than you put into it. That is a fundamental principle of information theory. Now, a biological cell is in a sense like a little box in which information is contained. How can you then get more information out of it than you put into it? This is one of the most powerful scientific critiques of the biological theory of evolution.

But all of these arguments are going to be of no avail unless a very strong intellectual battle is carried out by those who are not afraid of not being given grants, of not getting promotions, not getting invited to conferences, and such things, because their criticisms go against what holds up the modern paradigm itself. What has to change is the modern paradigm. Once that changes, even with rigorous science, you can have a biology that is not evolutionary in the ordinary sense, a biology that accepts higher levels of being without denying the observable realities of life forms, that accepts Vertical Causality as well as horizontal causality, and that in fact would be much truer to the nature of things. Look how much we have to stretch the imagination to talk about the evolution of the eye, an example that has been often given. How absurd it is that gradually the molecules are said to rearrange in a blind being in the mud so that one moment it does not see and the next moment it sees!

We know how absurd that is, how much faith and acceptance of absurdity evolutionary theory demands of us. The same is true of the growing of a wing to fly, and learning perfect flight, this kind of thing. We all know such cases but most of us today accept evolutionary theory because anything else would have to have recourse to God, to an intelligent Creator. Rostand, the famous French biologist,

once said, "I believe firmly—because I see no means of doing otherwise—that mammals come from lizards, and lizards from fish; but when I declare and I announce such a thing, I try not to avoid seeing its indigestible enormity and I prefer to leave vague the origin of these scandalous metamorphoses rather than add to their improbability that of a ludicrous interpretation".[1] Yes, it is amazing to accept these absurdities, these unbelievable probabilities which I have mentioned. You know, someone has said that for one living cell to come into being, the probability would be the same as a monkey jumping on a typewriter and producing all the plays of Shakespeare. A lot of examples have been given. But people continue to believe in this absurdity, because if they do not the modern worldview will collapse.

For the modern world, evolutionism is like a "religious" principle, as it was particularly for Marxism. Marxism is based completely on what its followers call the scientific basis of historical evolution. Dialectical materialism was deeply influenced by Darwinism. Now Marxism is gone as a dogmatic theory and there are only a few staunch Marxists around. The rest have become feminists, greens, and so forth, but nevertheless, the philosophy it espoused is still around, though it is no longer a major ideology claiming world domination.

As for the so-called liberal West which was against Marxism, its whole worldview began with the idea of progress. The industrial growth—which at the same time produced the devastation of the natural world which we are now facing—is based on this unbeliev-

1. Quoted by Titus Burckhardt in his *Mirror of the Intellect*, translated by W. Stoddart (Albany: State University of New York Press, 1987), 36.

able idea of indefinite economic progress and the general progress of Western civilization. No serious thinker believes in progress anymore; only politicians do when they try to get votes, and claim that everything has to be progressing and expanding, getting bigger and bigger quantitatively through what is called development, meanwhile destroying the natural environment in the United States, Canada, and elsewhere. Modern societies are conditioned to continue on this path, making ever-bigger cars, using ever-greater energy and natural resources, and so forth. This idea is very deeply ingrained in the minds of ordinary modern people; it is usually done through education which too is bound to the theory of evolution. Evolutionary theory in fact provided a "scientific" basis fro the idea of progress in the nineteenth century, although the idea of infinite progress in the modern sense antedates Darwin.

We are taught at school that the evolution of animal forms leads to human beings who in turn evolve through progress. Even today in most museums in the West, native people are displayed along with animals. I mean, if you go to the Museum of Natural History in New York, you see the mammoth and similar creatures and then you see aboriginal Americans. And then you have the advanced human beings whose works are demonstrated in the Metropolitan Museum across the park. I am sure that it is the same in Canada. This all goes back to a kind of anthropology that posits this naturalistic origin for the human being and then considers separately the white man who represents advancement and the progress of humanity. One does not talk about this matter too much these days because of accusations of racism, but this was the prevalent

view in the nineteenth and early twentieth centuries, when it was widely held in Western culture in general and Western man was seen as the crown of this evolutionary development. According to this view, Western civilization developed and evolved into a more admirable and advanced state than other civilizations, so that a Frenchman thought that he was more evolved than even a Bulgarian, since he was a western European, though they were both white and both Christian, not to speak of Asians or Africans. This widely held view propped up by the idea of evolution combined with progress is not by any means dead, as we observe in the disguised persistence racism in the West, and is not going to go away just by criticizing it intellectually. We have to understand its real nature and then criticize it intellectually as well as morally, for wherever this idea has gone it has destroyed the existing traditional structures of thought.

Look at India. We are very fortunate in the Islamic world, as far as this question is concerned, in that we do not as yet have a Hindu type of divinization of matter based on the theory of evolution and turned into a religious idea, as we find in a Sri Aurobindo or a Teilhard Chardin. People in the Islamic world who are evolutionists are not important and influential religious thinkers. I do not mean that they do not have any impact or influence, but their influence is limited, confined especially to the Indo-Pakistani subcontinent where the British taught evolution in all the schools. Four-fifths of Muslim evolutionists come from India and Pakistan. The Arabs and the Persians were protected to a large extent from this prevalent error by the language barrier, but of course there are also Arabs, Turks, and Persians who

believe in evolutionary theory.

Iqbal: Very few Muslims have written on the subject of evolution from a scientific perspective. There are very few works that one can find which present truly Islamic perspectives on modern biology as such. What do you consider is the reason for this? Then we have Muslim biologists who have studied in the West who can come up with explanations of data from Islamic perspectives, but they do not write on the subject. What are the reasons for this in your opinion?

Nasr: Before answering you let me say a few words about the paleontological evidence that is usually marshalled to prove evolution. This record does not prove evolution at all. All of the skull shapes whose pictures are usually shown in the books of biology taught in schools to demonstrate the truth of evolutionary theory, from monkeys to intermediate states to man and so on, nearly all of these skull sizes can be found among human beings in any large city, all of whom have two legs, and if they kill somebody they go to prison and are responsible before the law. They are variants of a single species. Somebody once said that in a big city like New York one can find all of those different size skulls seen in high school books of biology to demonstrate human evolution. A lot of the pictures and paintings used to demonstrate evolution are a hoax. Ninety-five percent of our neurocells may be similar to those of monkeys, but this does not prove anything. Arabs and Jews in Palestine and Israel have almost identical DNA, but they are two very different people and they are unfortunately constantly fighting each other. Factors other than the DNA must be playing a role.

To reduce the human being to molecular structures, that itself is a great sin from the Islamic point of view.

Not only for the human being, but also the falcon, the wolf, whatever it is, this reduction implies the destruction of the "form" (in the Aristotelian sense of *morphos*) of that creature, the "form" which at once defines that creature and reveals its essence. This is reductionism. The result of the differences in animal and plant forms now explained on the basis of cell structures could also be explained through the natural philosophy of Ibn Sīnā in a logical manner without recourse to cell structure and without denying what we learn from studying cell structures.

What the traditional Islamic thinkers said is that you have levels of existence of life forms starting with plant life, which is superceded by animal life through the creative power of God, while this animal life also includes plant life within itself. Moreover, plant life itself has many levels not caused by temporal evolution but by the descent of archetypes into the temporal order, as is also true of animals. We know, for example, that we have vegetal nerves about which Ibn Sīnā speaks. In the animal realm we also have a hierarchy; many Muslim thinkers such as al-Bīrūnī and Ibn Sīnā have written about this matter and have asserted that there are simple life forms and then ever-more complicated life forms, and that the complicated life forms contain within themselves the simpler life forms.

Obviously human beings have a more complicated life form than the monkey, but also possess some of those characteristics we see in the monkey, but this does not mean that we have evolved from the monkey. That is the whole problem. If you function in a universe of discourse where there is nothing but the material world as claimed by modern science, then there is no choice but to explain higher life forms

as the evolution of lower forms which are reducible ultimately to material aggregates. But if you live in a universe in which you accept the unique creative power of God, with which I began my discussion with you, then it is easy to accept that Divine creative power can create anything, including living forms, can bestow life, and can also endow human beings with the spirit.

In that universe this horizontal relationship between various creatures, from the inanimate to the plant to the animal and from the animal to man, does not at all negate the vertical hierarchy and archetypal reality of each of these beings in the higher world, and finally in the Knowledge of God. How can a Muslim deny the verse of the Qurʾān which says that the entire cosmos is in the Hands of God? And if God does not know the ant in the metaphysical sense, because the ant has no essence to be known in a permanent manner but is simply part of the temporal flow and not the result of His creative act, how can He be God from an Islamic perspective? The Qurʾān says so specifically, that God is the creator of all things and that the essence or spiritual reality (*malakūt*) of everything is in God's Hand—and if you cannot accept the Qurʾān, you cannot speak as a Muslim thinker. If God has knowledge of the ant, the ant must have a kind of archetypal reality in the "mind" of God, in the Divine Intellect. To say that there is no such creature whose essence is the reality of the ant, that the ant is simply a stage in evolutionary transformation, and process, is to take a certain part of temporal sequence and call it an ant; before that it was something else and will evolve into something else. The whole statement of God knowing His creation and having the spiritual reality of all things in His

Hand becomes absurd. This is itself a very strong argument against evolutionism from the Islamic point of view.

There is another important matter which would require a separate essay to expound fully but which must nevertheless be mentioned here in passing. According to Islamic metaphysics, God is not only the Creator of the world but also its Sustainer and Nourisher. He has not only existentiated the world, but He also re-creates the world and all the forms in it including living beings at every instant. If this ever-renewed creative act, which is also the existentiating act, were to cease, the cosmos and everything in it would become nothing. What appears to us as objects existing in time is in reality the repetition of the Divine *Kun* (Be!) at every instant. Therefore, relying solely on horizontal and temporal causes and neglecting the existentiating Vertical Cause, which is beyond time, is to misunderstand the real nature of created beings and God's relation to His creation. Once one understands this basic truth, the whole question of evolution versus creationism as irreducible alternatives disappears.

Now to turn to your question as to why we have so few Muslims writing about these matters. This is a tragic consequence of our educational system. We train a lot of Muslims to become scientists and many become very good Western scientists, some are among the top scientists of the world today, but they are not Islamic thinkers. Most of them have had no education in Islamic thought. So they usually combine two things together: religious practice and piety, which their parents have taught them, and also because of their own good nature and faith which God has bestowed upon them, so that they pray and fast and so

forth; and Western science that they have mastered through their education in Western or Western-styled schools. In the middle of that, what is missing is traditional Islamic learning. For example, if you really master the doctrine of substantial motion (*al-ḥarakat al-jawhariyyah*) of Mullā Ṣadrā, the great seventeenth century Persian Islamic philosopher, you can explain the theory of evolution without being a Darwinian evolutionist. You can believe in both the archetypal realities in God's Knowledge that are reflected in the temporal flow and the constant flow and motion of the substance of the material world which bears the imprints of those archetypes. When I was studying Islamic philosophy in Persia, I studied just this one idea of Mullā Ṣadrā for a whole year: the trans-substantial movement in the cosmos. How can God know this flow? Will this not introduce change in God's Knowledge? We studied just that one idea for months. This is, needless to say, a complicated issue; it is not for children. We have few people in the Islamic world who can understand such deep theological and philosophical ideas and are, at the same time, good biologists or physicists, and that is a tragedy.

In any case, what we have to resist is this idea of following in the footsteps of Christian theology, which has surrendered itself more and more to evolutionary theories which change every fifty years anyway. These days we have the theory of S. Jay Gould, of volcanic eruptions of species, and now some theologians are scrambling to bring out a Christian version of that idea. We should not follow that path. There *are* some Christian theologians who have not followed that path, traditional Orthodox and Catholic theologians especially, as well as some Protestant

theologians. We should remain faithful to authentic Islamic thought and provide an alternative worldview which remains honest and logical, which remains true to any finding of the microscope or of biology, but which does not surrender to the prevalent materialistic and reductionist worldview that is a truncated worldview, within which there is only one way to explain the diversity of life forms. If suddenly a fish grows wings and starts flying and a blind fish opens up its eyes and sees, and all kinds of things like that, we should not follow the path of providing logically absurd answers which also keep the Hands of God out of His creation. We should remember biological evolution is more "miraculous" and requires more faith than any miracle that is claimed by any religion for its founder or even for God. If you really think about it, and if you do not become in a sense metamorphosed, mesmerized, or paralyzed by the outward power of current scientific claims, if you really think clearly, you will reach that conclusion.

I was once attending a graduate class at Harvard in paleontology taught by one of the world's great experts on that subject, and he kept presenting to us the paleontological evidence for evolution: the Cambrian, the Ordovician, and so on, but in each of these periods one saw the sudden appearance of all of these trilobites, other fossils, and in every case there was no continuity of stages of evolution of one form into another. So I asked him, "How is it that in the Pre-Cambrian, you have practically no fossils in the world, and suddenly you have this explosion of fossils? These forms seem to appear suddenly, as they do in other geological periods. He looked at me and said, "Hossein, we do not ask these questions anymore," which meant shut up, and then I

said to myself, "Look, this is not for me. I do not care what the consequences will be for my academic success; my mind is made up to try to seek the causes of things!" This, then, is the evidence, the so-called paleontological evidence for evolution, as claimed by classical Darwinism.

Paleontology does not support the theory of evolution as usually taught, and that is why some famous biologists such as R. Sheldrake and S. Jay Gould have proposed other ways for explaining the phenomena of the multiplicity of life forms on earth, departing from classical Darwinism but still calling it evolution although what they propose is based on a different understanding of this term. Their explanations and those of many other biologists are not evolution as it was so strongly defended by its proponents until yesterday. Sheldrake speaks of fields of morphic resonance in relation to the appearance of various species. Such a view in a sense is a return to what we believed traditionally, that is, that the forms of all things have a higher state of being and they become crystallized in this world at a particular moment. Moreover, for religious people this occurs according to what God has destined for a particular world, including ours, and this does not contradict what is observed scientifically.

Iqbal: What could be the solution—we have talked about this before in a different context, in the context of technologies, but here I would like to focus on biological origins—what could be done to clarify things at least for Muslims? First, how can we have a critique of modern science in general but specifically modern biology since we are talking about biology, and secondly, how can we make an effort that would bring together scientists and religious thinkers and

produce a generation of Muslim thinkers who understand science and Islam in the sense in which you are talking?

Nasr: That will not happen unless what is called science today is, first of all, mastered and then integrated into the Islamic worldview. Western science carries with it a philosophical and ideological baggage of which most scientists are not aware, especially Muslim scientists, and that is the great problem. Science becomes scientism, as has happened not only in the West but also in so much of the Islamic world—we have already discussed this issue together. I think that scientism is one of the great illnesses of the Islamic world today.

Coming to the human state, let me start with this famous story: Once a person went to ʿAlī, may Allah be pleased with him, and said, "*Yā* ʿAlī, who was there before Adam?" And he replied, "Adam". "But who was there before that Adam?" And he said, "Adam. And if you continue to ask me this question to the Day of Judgment, I shall continue to say Adam." This is a very profound saying. Now, the human being has been a human being since the first arrival of human beings in the world. They have not evolved from other beings whose bones bear similarities to theirs. You could go take the bones of a chimpanzee and put his bones next to my bones after I die and there will be similarities, obviously, but that does not mean that the human body has evolved on the basis of purely material factors from the chimp. There is obviously a discontinuity that reveals the manifestation of a higher level of reality.

The human beings, for example, have always done something based on ritual with their dead, as far back as we can go. The famous French anthropologist, J.

Servier, an exceptional anthropologist, once wrote a book, *L'Homme et l'invisible* (*Man and the Invisible*), wherein he showed, on purely anthropological and paleontological evidence, that the earliest human beings buried their dead or had some other ritual for the dead, which shows that they believed in immortality; they believed in another world, and that means that we have not in fact evolved at all in a basic way. There is nothing unscientific about this, nothing that anyone can disprove. Yes, for example, we make better tools than some people on some island, from Sumatra or Borneo let us say, but so what? If you bring a son of that person to our school, he could make a computer, as we can see today before our eyes. It is not that they are different in nature from us; I think that the modern world has amply shown this truth. Differences involve the question of nurture, environment, culture and so forth. We are all human beings. Some are more intelligent, some less so. Different races have different characteristics. I am not a person to deny the reality of races. God has made us like that. Certain races have special gifts in different arts, like the Chinese in painting, like the Africans in dancing. There is no doubt that there are different races and within each race there is a spectrum and degrees of qualities and preferences. Some cultures have created an advanced architecture and others did not. The ancient Egyptians produced remarkable architecture, but in Sudan, which is a neighbor, there are no pyramids.

All of this can be demonstrated scientifically without denying that God created us and having to insist that man has evolved in any basic way. And it is with the creative acts of God that we Muslims must begin. 'Created' means that He created a body into which

He breathed His Spirit, which means He bestowed upon us pure intelligence and consciousness, among other things. The fact that we can think independent of material things is itself sufficient proof of our immortality, no matter what behaviorism says. The fact that our consciousness can reflect upon itself, that we are conscious of being conscious, is a characteristic given to us by God. We were conscious before coming into this world, although we have now forgotten that state of being, and we shall be conscious again after we leave this world.

The human being has a type of consciousness which animals do not have. We are conscious of our death as well as being born and are aware of the question of where we were before birth and where we will be after death. All of these things have to do with the particularity of the human state and although we have continuity with the rest of creation, we also have a discontinuity. The great paradox of the modern world is that modern Western science emphasizes the continuity while modern Western culture emphasizes discontinuity, so much as to enable modern man to destroy much of the rest of creation in the name of human welfare. What a paradox!

This is the situation in which we live and I think Muslims—as I have always said in other contexts—have a tremendous responsibility, because we are one of the very few civilizations left in the world which are not Western and which have also had a vast scientific and intellectual tradition, and which can provide alternatives. Otherwise, where shall we be going? We are going to evolve ourselves into nonexistence. Muslim thinkers must cling to the verities of the Qur'ān and the Islamic intellectual tradition, master the modern sciences, including biology, as

well as the Western criticisms of these sciences, and then provide an authentic Islamic interpretation of the data of these sciences without accepting the ideological basis of the interpretation of these data, this ideology being itself founded upon a specific philosophy that is not acceptable to genuine Islamic thought.

Iqbal: One final question regarding the creation of Adam and his children. One comes across Muslim thinkers who say that Adam evolved. With reference to the story in the Qur'ān of Adam being in *Jannah* (Paradise), they claim *Jannah* was on this earth, and they thereby destroy the whole set of beliefs and notions associated with the Qur'ānic term *hubūṭ*, the Fall, the descent of Adam to this Earth. These modernist Muslims disagree with the traditional understanding of Adam in order to accommodate evolution. What can you say to these modern interpretations within the Islamic world?

Nasr: This is sheer blasphemy, one of the worst kinds of blasphemy, because it deprives Muslims of their eschatological hope. The *Jannah* described by God in the Qur'ān does not look like the earth as we know it, even if originally the earth was a paradise (though this is a separate matter) and even if, when God first created the earth, it was called the terrestrial paradise in Christian theology. Islam also sees creation in its virgin state as a *reflection* of *Firdaws* or, the Garden (*Jannah*) but it is not the *Jannah* (Paradise) itself to which the soul of those imbued with goodness will go in the Afterlife. Furthermore, God first put man in *Jannah* but He also gave him free will, which is why he ate of the forbidden tree and fell (*hubūṭ)* here onto earth.

Our position here on earth is always going to be a

state of fall from perfection. Other religions share this idea like us and assert that we have descended, not ascended. That is the foundation of all ethics. Without our idea of descending from a perfection, there is no foundation for ethics, philosophically speaking. Why should we then be ethical if there is no higher norm?

This is a crucial matter and the Qurʾānic verses are extremely clear on this question. Anyone who identifies paradise with some place in Africa where Adam gradually evolved is guilty of the worst kind of heresy, theologically. Such people are not serious Muslims anymore. It is explicit in the Qurʾān that, in speaking of the Garden where Adam was first placed, it is describing a state of being which possesses a perfection that the fallen Adam no longer possessed. The word *hubūṭ* is a Qurʾānic term and one cannot change it to anything else. If one does that, there is nothing left of one's relationship with the Islamic tradition.

Iqbal: *Hubūṭ*, they say, linguistically simply means to go from one place to another, without necessarily having any connotation of coming down, that is, the Fall. They explain it etymologically and claim that the word itself does not contain the idea of the Fall, as in the Qurʾānic verse, "*ihbiṭu miṣran*…".[2]

Nasr: That is not correct; we cannot accept it. This means that for fourteen hundred years Muslims were wrong, until someone in the streets of Cairo, who has become totally Westernized and ignores the Islamic oral tradition as well as various clear *aḥādīth* on this matter, comes along and says *hubūṭ* does not mean fall! This is a form of scientism that has polluted our intellectual atmosphere such that one can no lon-

2. *al-Baqarah*: 61.

ger safely breathe. Such people have contributed to a mental and intellectual pollution that prevents many people from being able to think clearly anymore in the same way that we cannot breathe easily in our big cities because of physical pollution. I think it is our duty to state categorically the traditional positions, and that has been my vocation in life. I am not afraid of anyone but God, I am not afraid of demotion, or anything like that, when I speak of matters that are against the fashions of the day. We have to state clearly what our position is. There is a great intellectual struggle that is going on within the Islamic world, especially in the relation between religion and science, and we have to do what we can to steer it in the right direction; and that is not a small matter. And we have to make clear what the real issues are and prevent muddled thinking. May God help us in this momentous task.

Iqbal: *Jazāka'Llāhu khayran*.

Keynote Address

7

The Islamic Worldview and Modern Science

The issue of Islam and modern science along with its progeny, modern technology, continues today as one of the most crucial matters faced by the Islamic community. It has been and continues to be addressed by numerous scholars and thinkers, covering nearly the whole gamut of the spectrum of Islamic intellectual activity since the last century. Far from being recent, this intense interest in the subject goes back, in fact, to the beginnings of the intellectual encounter between the Islamic world and the modern West, in the early nineteenth century, and embraces the *nahḍah* movement in the Arab world as well as similar movements among Persians, Turks, and the Muslims of the Indo-Pakistan Subcontinent at that time. It has also attracted figures as different as Jamāl al-Dīn Astrabādī (al-Afghānī) and Syed Ahmed Khan, Zia Gökalp and Muhammed Iqbal, the followers of the *salafiyyah* movement, and, in our times, the various *shaykhs* of al-Azhar, as well as practitioners of modern science such as ʿAbd al-Salam.

While in earlier days the interest of Muslim thinkers in Western science, and to some extent technology, was due to their challenge on the intellectual and theological levels as well as to the political independence, at least on paper, of Muslim lands, the interest of Muslim governments in sci-

ence and technology today is almost always because of what they feel is their need to gain power, whether it be economic or military, and is not based on wisdom. In fact, an army of modernists has joined the so-called fundamentalists[1] in their indiscriminate praise of modern science and technology, blindly equating science in its current English sense with *al-ʿilm* of the Noble Qurʾān, the *Ḥadīth*, and the whole Islamic intellectual tradition. Most have remained impervious to the difference between the goal of knowledge as the gaining of wisdom, increasing the depth of understanding of God's signs (*āyāt*) and His creation in relation to Him, and the perfecting of the human soul, on the one hand, and its goal of gaining power to dominate over God's creation and other human beings, especially those belonging to another nation or ethnic or religious group, as the history of the modern West so readily exemplifies, on the other.

Of course, one can understand why the blind praise and almost "worship" of modern science and technology are manifested everywhere among sectors of Islamic society despite profound political, theological, and judicial differences, when one sees a war in which some sixty people are killed on the other side and many thousands on the Muslim side, or observes that in every encounter of Muslims with others, from Bosnia to Chechnya to Kashmir to the Philippines, Afghanistan, Iraq and Palestine, the Muslims are always on the defensive and the ones to be massacred and in some cases "cleansed."

Yet, this desire to adopt Western science and technology blindly and without critical appraisal, no matter how understandable on the emotional level or that of political expediency or even necessity, cannot remain heedless of truths underlying the profound issues of the relation between the Islamic worldview and modern science. And, Islamically speaking, it is always the truth (*al-ḥaqq*) that must prevail, and we as Muslims must always think in terms of the truth rather than expediency, whether it be political or otherwise,

1. See Seyyed Hossein Nasr, *Traditional Islam in the Modern World* (London: KPI, 1990), 11 ff.

never forgetting the Qurʾānic verse *And say: the truth has come and falsehood has vanished away; verily, falsehood is bound to perish*.[2]

It is, therefore, necessary before anything else, to analyze modern science and subject it to an in-depth criticism from the Islamic view, by which is meant not just any view that claims to be Islamic by combining the external meanings of some verses of the Noble Qurʾān with all kinds of concepts and "isms" imported from the modern West, but the view drawn from the Islamic intellectual tradition, including all its branches, and understood traditionally and in the most universal perspective of Islam, rather than through theological or judicial sectarianism.

A Critique of Modern Science

It is not possible to do justice to a full criticism of modern science from the traditional Islamic point of view in this short presentation, a task which has been carried out in one way or another by other scholars and the author of this work in other contexts, although much still remains to be accomplished.[3] Some of the essential points related to this criti-

2. *al-Isrāʾ*: 81.

3. See, for example, the brilliant works of Titus Burckhardt, especially his *Mirror of the Intellect*, op. cit.; also his *Moorish Culture in Spain*, trans. Alisa Jaffa (London: George Allen and Unwin, 1972). See also Osman Bakar, *Tawhid and Science, Essays on the History and Philosophy of Islamic Science* (Kuala Lumpur: Secretariat for Islamic Philosophy and Science, 1991). As for our own writings, see S. H. Nasr, *Science and Civilization in Islam,* op. cit.; *An Introduction to Islamic Cosmological Doctrines*, op. cit.; *Man and Nature, the Spiritual Crisis of Modern Man*, op. cit.; *Islamic Science: An Illustrated Study*, op. cit.; and *The Need for a Sacred Science*, op. cit. See also the *MAAS Journal of Islamic Science*, edited by M. Zaki Kirmani at Aligarh University, which contains numerous studies on this issue, and more recently, the semi-annual journal *Islam & Science*, edited by Muzaffar Iqbal. See also, Rais Ahmad and S. Naseem Ahmad (eds.), *Quest for New Science* (Aligarh: Center for Studies

cism must, however, be mentioned here.

The first, which has even reached pulpits throughout the Islamic world, is a negative one. It is the refusal to study Western science critically, often as a result of a kind of intellectual inferiority complex which then simply equates Western science with the continuation of Islamic science without any consideration of the shift of paradigm and the establishment of a new philosophy of nature and science during the Scientific Revolution, events that distinguish modern science sharply from not only Islamic science, but also from its own medieval and early Renaissance past. It is astounding that some not only simply equate modern science with Islamic science but also try to apply the modern philosophy of science, based upon an agnostic science of nature and often in a mode already out of fashion in the West, to judge the veracity or lack thereof of Islamic positions.[4]

The second point concerns the relation between a value system and modern science. Instead of criticizing the implicit value system inherent in modern science from the Islamic point of view, many of the champions of the blind emulation of modern science and technology claim that it is value-free, displaying their ignorance of a whole generation of Western philosophers and critics of modern science in the West itself who have displayed with irrefutable arguments the fact that modern science, like any other science, is based on the particular value system and a specific worldview rooted in specific assumptions concerning the nature of physical reality, the subject who approaches this external reality, and the

in Science, 1984). Furthermore, see various works of Syed Muhammad al-Naquib al-Attas, especially his *The Positive Aspects of Taṣawwuf: Preliminary Thoughts on an Islamic Philosophy of Science* (Kuala Lumpur: Islamic Academy of Science, 1981).

4. A case in point is the positivistic and rationalistic philosophy of Karl Popper, which, already seriously criticized in the West, is adopted by a number of people, especially in Iran and Pakistan, to evaluate and criticize the traditional Islamic epistemologies and philosophies of knowledge including science.

relation between the two.

Modern science must be studied in its philosophical foundations from the Islamic point of view, in order to reveal for Muslims exactly what the value system and philosophical assumptions concerning the nature of reality are upon which it is based and how this value system and philosophical assumptions oppose, complement, or threaten the Islamic value system and concept of nature—which for Muslims ultimately come from God and are not merely human forms of knowledge. The modern sciences are, on the contrary, based by definition upon human reason and the five external senses, and specifically deny any other possible avenue for authentic knowledge. Muslim thinkers must stop speaking of modern physics as not being Western but international, while hiding its provincial foundations grounded in a particular philosophy and value system related to a specific period of not global but European history. Even a 747 Boeing jet is not simply global because it is now landing in Samoa, Tokyo, Beijing, as well as Islamabad or Tehran. Rather, it is the result of a technology derived from a particular view of man's relation to the forces of nature and the environment, as well as of the understanding of man himself, a view that many forces in the modern and even post-modern West are trying to globalize, by eliminating other views of the world of nature and man's relation to it, including of course, the Islamic one.

Modern science is a direct challenge to other worldviews, including the Islamic, which claims a knowledge of reality based upon not reason alone, but also revelation and inspiration. In any case, any major criticism of modern science must include the value system and the worldview upon which it is based and which it propagates. It remains, therefore, a major duty to make clear what these values and worldviews are and to evaluate and criticize them from the authentic Islamic perspective.

Closely associated with the general question of values is that of ethics. Numerous writers have spoken of how ethical individual scientists are and how the unethical use of

modern science is not their fault. There are, of course, many devout Christian, Jewish, and Muslim scientists in the West as well as Muslim, Buddhist, and Hindu scientists in the East. But this fact has nothing to do with the non-ethical character of modern science itself. Some of the most ethical scientists whom we met in our youth helped make a bomb which killed over two hundred thousand people in two days in Japan half a century ago, not to speak of the tragedies brought about by ethical German scientists during the Nazi period. Moreover, the result of the work of the most humble scientists who would never put their foot on a marching ant have helped destroy numerous species in God's creation.

As a matter of fact, knowledge and its applications cannot evade ethical implications. Modern science has helped to destroy all other perspectives on nature, including the religious, by relegating their claim to a knowledge of the world of creation to poetry, myth, or even worse, superstition, and thus has barred them from the citadel of the officially accepted knowledge of nature. And yet what remains of ethics in the West is essentially from the Abrahamic tradition and, therefore, close in many ways to the ethical principles and practices of Islam. By rejecting the Abrahamic tradition's claim to a knowledge of nature, modern science has helped create a condition in which this ethical heritage is being eroded more and more every day, since it does not correspond to any objectively accepted knowledge of reality in the modern world.

Nor should Muslims ever think that this situation has occurred only because of the weakness of Christianity, and that negative ethical consequences of the applications of science seen in the West would not be followed in the Islamic world. Such a conclusion would be nothing other than the result of that superficial and shoddy thinking based usually upon scanty knowledge of the West's intellectual, philosophical, and scientific history which unfortunately has characterized much of the Muslim response to the modern West since the last century.

What is needed is a positive Islamic critique, based on

knowledge and not slogans, not only of modern science concerning what it is, but also concerning what it is not, though many of its exponents and popularizers claim for it. Modern science is not the only legitimate science of the natural order, but is *a* science of nature, legitimate only within the premises of its assumptions of the nature of both the known object and the thinking subject. Muslims must be able to maintain the traditional Islamic intellectual space for the legitimate continuation of the Islamic view of the nature of reality to which Islamic ethics corresponds, without denying the legitimacy of modern science within its own confines. Otherwise, no matter how many times Muslim scientists pray, the displacing of the Islamic intellectual universe by one drawn from modern science, while it may make Islamic countries rich and powerful, will destroy the hold of Islamic ethics upon the larger Islamic community. One observes this event taking place not only in the case of the Christian West but also among those sectors of modernized Muslims who have abandoned most of their spiritual and ethical heritage in the name of "the scientific worldview," propagated on the one hand by the now mostly defunct Marxism as a pseudo-religious slogan, and on the other hand by secularism and naturalism hoisted as the flag which unifies so many secularists, humanists, and other anti-religious forces in the West.

And finally there is the most essential criticism concerning the neutral attitude of modern science regarding religion and the paramount role of science in creating a mental ambience from which God and the eschatological realities are absent and, therefore, finally "unreal". Numerous Western writers have tried to show that modern science is not against religion and does not necessarily deny God, and many Muslims have claimed the same. But during most of these debates, religion and not science has always been asked to reform itself or change its doctrines, especially its claims upon knowledge of both supernatural and natural reality, with the result that four centuries after the rise of modern science, it is religion that is now to some extent marginal-

ized, and not science.

Occasionally Western theologians, usually in awe of modern science, point to this or that scientific discovery as confirming a particular religious teaching, unaware of how dangerous it is to correlate that which possesses the character of absoluteness with a form of knowledge that is by definition transient, although it does reflect certain metaphysical truths if seen from the metaphysical and not simply scientific point of view.[5] This type of shallow correlation is especially evident these days in what is now called cosmology in the West, which is nothing but the extrapolation of astrophysics and has nothing to do with cosmology as traditionally understood.[6] For years, many theologians have been excited about the Big-Bang Theory which, they claim, accords with the Biblical and even Qurʾānic understanding of creation, and many symposia have been held on this matter. Meanwhile, many cosmologists are now beginning to deny the reality of the Big-Bang Theory itself.

The significant point here is that there must be a profound analysis and critique of modern science in its relation to religion from the Islamic point of view and totally opposed to that enfeebled intellectual reaction that first accepts the theories, hypotheses, and even conjectures of modern science as being absolutely true and then tries to torture this or that verse of the Noble Qurʾān or a particular *ḥadīth* to prove Islam's conformity to this most transient form of knowledge, whose prestige emanates not from the illumination that it provides of the nature of reality, but from the fact that it leads to the acquiring of wealth and power over nature, as claimed by one of its founders, Francis Bacon.

It is essential to show that in modern science, the very

5. See Wolfgang Smith, *Cosmos and Transcendence: Breaking Through the Barrier of Scientific Belief* (La Salle: Sherwood Sugden and Co., 1984).

6. See Burckhardt, *Mirror of the Intellect*, op. cit., 13 ff. See also Wolfgang Smith, *The Wisdom of Ancient Cosmology—Contemporary Science in Light of Tradition* (Oakton: Foundation for Traditional Studies, 2003).

"hypothesis" of the existence of God is redundant to the system. One can be a famous physicist who is a devout Catholic, Jew, or Muslim, but also a renowned physicist who is an agnostic or atheist. The reality of God has had nothing to do with the system of modern science as seen by that science, and He has been called by some scientists "an unnecessary hypothesis". Today, physics itself is changing and some speak of the necessity of considering God and consciousness as fundamental to even quantum mechanics, but this view is still far from being acceptable to the majority of modern physicists, and the prevalent view taught as the only correct and legitimate form of knowledge is one from which God is simply absent, no matter how many modern scientists believe individually in Him.

How can Islam accept any form of knowledge which is not rooted in God and does not necessarily lead to Him? How can it explain the universe without even referring to the Transcendent Cause of all things, of which the Noble Qur'ān speaks on almost every page? Traditional Islamic thought has provided many profound answers to such quandaries, while the contemporary Islamic world can be characterized as being particularly bereft of responses which would even approach the depth of the answers provided by our ancestors. That is why, in fact, those scientists and thinkers in the West seriously interested in alternative views of reality are much more interested in the Muslim thinkers of old than in contemporary Muslim voices. There is no way to find a path toward a healthy relation between Islam and modern science other than an in-depth critique of any system which claims knowledge of God's creation, including modern science, from the Islamic point of view.

The Question of the Absorption of Modern Western Science

For over a century, various Muslim leaders, whether they be religious or political, have pleaded for a rapid and complete absorption of modern Western science and technology, occasionally adding a few pious remarks that this act must be

combined with the preservation of Islamic ethics. There is, however, no possibility of absorbing modern science blindly without the greatest negative consequence to Islamic society. There can, of course, be the type of adoption based on blind emulation rather than judicious selection that one observes in many Islamic countries today, without such attempts to accept modern science in toto having led to any notable scientific activity and creativity which are Islamic, nor to the complete integration of modern sciences into the Islamic worldview. At best, it has led to contributions to the prevalent modern science by men and women who are Muslims, but whose Islamicity has had little to do with the science to which they have contributed. If there were to be a successful total integration of the facts of modern science into the Islamic worldview, however, the impact upon the very fiber of Islamic society would be much greater than what one sees today, that is, a lamentable situation resulting precisely from the current lack of success in the carrying out of such a process.

The uncritical adoption of Western science can be carried out completely only by absorbing also its worldview, in which case the consequences for the Islamic view of reality, both cosmic and metacosmic, cannot be anything but catastrophic. Nor has it been otherwise for other religions. Those who keep mentioning the case of Japan should not only look at the success of that nation scientifically and technologically while some of its traditional institutions, such as that of the emperor, have been preserved and people continue to wear kimonos and use chopsticks. The situation must be seen also from the perspective of Buddhism and Shintoism and the spiritual havoc wreaked upon the Japanese religious traditions, causing a major social crisis to the extent that now some in Japan are speaking about the "Re-Asianization" of that country.

What then is to be done? Digestion of any external substance for any living being involves both absorption and rejection. If we were to absorb all that we eat without rejecting some of it, we would die in a short time. The case of

a living religion and civilization are similar and, lest one forget, Islam is still a vital and living religion and even the great civilization created by this religion, although partly destroyed by not only Europeans but also modernized Muslims themselves, is far from being defunct. Islam and Islamic civilization cannot adopt modern science seriously without rejection, as well as absorption—which one could call judicious adaptation and absorption—based on the principles and nature of the living reality of Islam and its intellectual tradition within which the act of adopting and absorbing is to take place.

If proof be necessary for such an obvious assertion, one needs only to turn to the history of the Islamic world during the past century. Rabid modernism, blind adoration, and the emulation of modern science have certainly not brought about a major scientific renaissance in the Islamic world. A kind of shallow scientism has produced a large number of scientists and especially engineers in the Islamic world without spawning a scientific activity springing from the heart of Islamic civilization itself, from which many Western trained Muslim students of modern science find themselves alienated. Those with personal piety take refuge in the great gift of faith (*al-Īmān*) and continue to pray and recite the Noble Qurʾān, but intellectually they feel exiled from the traditional Islamic intellectual universe, which they then begin to criticize as not being really Islamic, thereby creating the cleavage in the Islamic intellectual world conspicuous in so many Islamic countries today. Moreover, this attitude toward Western science has helped to destroy much of the Islamic humanities, thereby creating a vacuum whose consequences are evident in many parts of *Dār al-Islām*.

What is needed is the re-discovery and re-formulation in contemporary language of the Islamic worldview, within whose matrix alone can any foreign body of knowledge such as modern science be studied, criticized, digested, and the elements alien to that worldview rejected. Moreover, this worldview, as far as the cosmos and the whole question of various scientific epistemologies are concerned, cannot be

simply extracted from the Sacred Law or *al-Sharīʿah*, which embodies God's Will for our actions in this world, nor even from *Kalām*, whose role has always been to protect the citadel of faith from rationalistic attacks, nor still from jurisprudence (*al-fiqh*), understood in its current sense rather than in its Qurʾānic meaning. Rather, it must be drawn from the *ḥaqīqah* which lies at the heart of the Noble Qurʾān and *Ḥadīth* as expounded and formulated by the traditional commentators, as well as Islamic metaphysics, cosmology, the doctrinal and intellectual aspects of Sufism, and the Islamic sciences themselves.[7]

Only in this intellectual tradition, shunned by both the modernists and many of the so-called fundamentalists, can one rediscover the authentic Islamic worldview as far as it pertains to the knowledge of nature and, in fact, the whole question of the levels of knowledge. Only with its help can Muslims really make their own any foreign body of knowledge which claims to correspond to some aspect of reality without either being destroyed in the process or remaining simple copiers and emulators. The history of the Islamic world during the past two centuries offers many lessons, if one were only to study it with the eye possessing correct vision or what the Noble Qurʾān calls *al-baṣīrah*.

Steps in the Creation of an Authentic Islamic Science

The road to the achievement of an authentically Islamic science[8] is long, yet a road that must be traversed if the Islamic

7. Many of our writings including those mentioned above have been dedicated to the achievement of this task.

8. A word must be said about the criticism made in certain circles about the defense of Islamic science as being a form of fundamentalism. This is a crass criticism based on a journalistic term created by the Western media, loaded with pejorative connotations and then employed by whomsoever the powers that be in the West do not like at the moment. Any group of people photographed praying together can be and has been used to demonstrate the danger of "fundamentalism" and its rise. By that logic, your grandmother and mine, who never missed a prayer in their lives, were

world is to remain Islamic and also create a science in conformity with its own ethos, as it did twelve hundred years ago. Let us then mention a few of the milestones on this long and arduous journey.

1. The first necessary step is to stop the worship-like attitude towards modern science and technology which is prevalent today in much of the Islamic world, where one can detect a crass scientism, long rejected by many of the leading physicists and philosophers of science in the West itself. This is present not only among modernist Muslims but also among certain of the most conservative elements of Islamic society who, while rejecting all use of reason within Islamic thought, accept scientism with hardly any questioning. In fact, the very attack of such groups against the Islamic intellectual tradition during the past two centuries has done much to create a vacuum filled quickly by Western positivism and scientism, creating tensions between external piety and submission to scientism that are bound to have even more catastrophic consequences in the future than what we observe today.

   This trend must be reversed and the whole of modern science and technology be seen not with a sense of inferiority, as though a frog were looking into the eyes of a viper, but from an independent Islamic worldview whose roots are anchored in Allah's rev-

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fundamentalist grandmothers. Furthermore, to draw examples from the modern West and to ask why there must be an Islamic science while there is no Christian science is to misunderstand the whole of modern Western intellectual history and in a sense place the secularization of the cosmos and the separation of the knowledge of the world from religion in the West as an example and ideal for the Islamic world, as if the religion of Islam based on unity (*al-tawḥīd*) could ever accept any form of irreducible dualism.

elation and which could be compared to the case of an eagle who roams the horizons and studies the movements of the viper without being mesmerized by it. In light of this worldview, the whole notion of decadence in Islamic civilization, especially as far as it concerns the sciences, must be re-examined. The West must no longer dictate the criteria for renaissance and decadence on its own terms and identify scientific prowess purely and simply with civilization, conveniently forgetting that a country can send astronauts to the moon while its teenagers are killing each other in the streets of that same country. Only by basing oneself on the authentic Islamic perspective can the inferiority complex so widespread among the so-called Muslim intelligentsia today be overcome and the ground readied for creative scientific activity related to the Islamic worldview.

2. There must be an in-depth study of the traditional Islamic sources, from the Noble Qur'ān and *Ḥadīth* to all the traditional works on the sciences, philosophy, theology, cosmology, Sufi metaphysics, and the like, to formulate the Islamic worldview and especially the Islamic concept of nature and the sciences of nature. This arduous and yet necessary task must be carried out within the framework of the Islamic intellectual tradition itself and not simply by going to certain verses of the Sacred Book, often taken out of context, and interpreting them by ourselves, with a mind usually cluttered by ideas, issues, and ideologies as far removed from Islam as possible. Surely this is one of the reasons why the Noble Qur'ān refers to guidance in these terms: *He leadeth astray whom He willeth and guideth whom He willeth*.[9]

People can be misled even in the reading of God's

9. *al-Naḥl*: 93.

Word if they are not guided by Him. How quaint at best and worthless at worst appear those interpretations of the Noble Qur'ān and *Ḥadīth*, so prevalent today among a number of Muslims in the West, as well as among an army of modernized Muslims in the Islamic world itself! Only the revival of the traditional Islamic worldview can provide an authentic alternative to the current Western worldview, which itself is now undergoing profound transformations and, in a sense, dissolution. This will avoid being a second-rate imitation of the Western view with a few Qur'ānic verses interspersed to give such types of interpretations a ring of Islamic authenticity.

The rediscovery of the authentic Islamic worldview, especially as it concerns the sciences of nature, also necessitates a deep study and understanding of the history of Islamic science to which any future authentic Islamic science must graft itself to become a new branch of a tree that has its roots in the Islamic revelation and a trunk and earlier branches which cover the span of fourteen centuries of Islamic history. Unfortunately, Muslims have not been as active as Western scholars in clarifying the history of Islamic science, and those who have done serious work have usually been influenced by the Western understanding of the role of Islamic science in the history of Western science and the positivistic understanding of the history of science in general as it developed in the West early this century an interpretation which has been challenged even by some Western scholars of this discipline.[10]

As in so many other fields, the agenda for Muslims in this domain has been prepared by Western sourc-

10. Stanley Jaki, *The Road of Science and the Way of God* (Chicago: University of Chicago Press, 1978), 3 ff.

es, even in the crucial field of Islamic science. Whatever the interest of the West might be in the history of Islamic science as a chapter in the development of its own science, the interest of Muslims cannot but be to understand the long development of science in Islamic civilization in relation to the Islamic revelation and other elements of the Islamic intellectual tradition. Islamic science must be seen and studied from the Islamic point of view and appreciated for its achievements and not simply because of its role in the sciences of another civilization, no matter how important that role is and how much it needs to be emphasized today. In the same way that there must be a proper Islamic philosophy of science, so must there also be an Islamic history of Islamic science and even history of science in general with its own methodologies, definitions, and purposes, while integrating all non-Muslim scholarship on this subject which is of a positive quality from the scholarly, historical, and philosophical points of view.[11]

3. A larger number of Muslim students should be allowed to study modern science at the highest level, especially the basic sciences or what the West calls pure

11. We sought to lay the foundation for such an approach over forty years ago when we first began to conceive our *Science and Civilization in Islam*; see also J. Glyn Ford, "A Framework for a New View of Islamic Science" in *ʿAdiyāt Ḥalab*, University of Aleppo, Vol. IV-V, 1978-79, 68ff. In recent years, a number of works have appeared by Muslim scholars following this line of thought. See, for example, the works of Osman Bakar, Muzaffar Iqbal, and Syed Nomanul Haq. It needs to be mentioned here how few in fact are the educational opportunities for young Muslim scholars to pursue fields such as the philosophy and history of Islamic science in an Islamic context or even in Western universities, in comparison with studying the applied sciences or engineering.

science. In the Islamic world today we have a large number of doctors and engineers in comparison to those who have studied the pure and theoretical aspects of sciences such as physics, chemistry, and biology, and who also work at the frontiers of these disciplines where alone can profound theoretical transformations be brought about. Those who speak with such gusto about the necessity of cultivating science and technology do not always realize that it is important also to train scientists who practice the kind of science which has no immediate utility but without which Muslims will always be at the receiving end and must of necessity remain satisfied with a few crumbs from the tablecloth of Western science and technology.

In contrast to what many have said about our being opposed to the cultivation of Western science, we have never advocated something which, in any case, is not a possibility at this moment of history. Rather, our proposal has been to master modern science in the best manner while criticizing its theoretical and philosophical bases and then, through the mastery of these sciences, to seek to Islamize science by taking future steps within the Islamic worldview and distinguishing what is based upon scientific "facts" from how that is interpreted philosophically, such as the stratigraphical structure of the Himalayas or the geometry of a crystal from hypotheses parading as scientific facts, such as Darwinian evolution. We have never preached ignorance, especially for a religion such as Islam which, based upon knowledge, must confront any other school or mode of thought which lays claim to the knowledge of reality.

How sad it is that, in many Islamic countries ruled by powers which claim to be great patrons of mod-

ern science, the general quality of education declined in so many fields during the twentieth century, as a cursory study of such major universities of the earlier days as the Universities of the Punjab, Aligarh, and Cairo reveal. It is impossible to understand, criticize, integrate, or transcend any form of science without deep knowledge of it. No amount of sloganeering and emotional outbursts can replace knowledge, whose primacy the Noble Qur'ān confirms in the verse: *Are they equal, those who know and those who do not know?*[12]

No one working in an inorganic chemistry lab can follow a formula of doing Islamic science rather than pursuing the chemistry established by Boyle, Lavoisier, and later modern chemists. But physicists and chemists working at boundaries of those sciences and imbued not only with piety but also knowledge of the Islamic worldview could transform this science in the direction of an Islamic science of materials in the same way that, with a new worldview or paradigm based on rationalism, empiricism, and secularism, seventeenth century chemists created the new chemistry upon the cadaver of the long tradition of alchemy whose inner meaning they did not even comprehend. In any case, any hope of opening a new chapter in the history of Islamic science that could integrate what can be integrated from modern science without causing the death of the Islamic view of the cosmos must rely upon those who, being deeply rooted in the Islamic worldview, also know the modern sciences at their highest level without having become swallowed and absorbed by the philosophical presumptions and secularist outlook of these sciences.

12. *al-Zumar*: 9.

As for those Muslims who are scientists but not functioning at the boundary of their science, they can at least point out the theoretical limitations of their science, the danger of scientism, the divorce of modern science from ethics and the necessity for Muslims to emphasize the significance of ethics as much as possible, and the crisis that the blind applications of their and other branches of modern science have caused in man's relation with nature and the harmony of nature itself. They can also point to all natural phenomena as *āyāt* of God with a significance beyond their material reality.[13]

How paradoxical it is that, while many Muslim political thinkers decry the fact that the Muslims are supposedly behind Western science and technology, the Islamic world is catching up and even equals or surpasses many areas of the West in its destruction of the natural environment, which is the direct consequence of the application of modern technology. Although we have discussed this issue already in this book, one can hardly refrain from mentioning again how important it is for Muslim thinkers, including scientists, to revive the authentic Islamic view of nature even before the act of the complete integration of modern science into the Islamic worldview takes place.[14] It is the duty of Muslim scientists dedicated

13. See M. Zaki Kirmani, "An Outline of Islamic Framework for a Contemporary Science" in *MAAS Journal of Islamic Science*, Vol. 8 (1992) No. 2, 55-75, where he deals with this and certain other issues raised in this paper. See also his "Moving Towards a New Paradigm" in Ziauddin Sardar (ed.), *An Early Crescent* (London: Mansell, 1989), 140 ff. See also the editorials of Muzaffar Iqbal in the journal *Islam & Science*.

14. See our "Sacred Science and the Environmental Crisis: An Islamic Perspective" in *The Need for a Sacred Science*, op. cit., 129 ff. See also Fazlun Khalid and Joanne O'Brien

to Islam to point out to Islamic society at large the real dangers that the whole globe faces as a result of the application of a science divorced from ethics on the one hand and forgetfulness of God on the other.

It is they who, along with other Islamic thinkers, must help open up a place in the current Islamic mental space for the study of other possibilities of studying nature, especially the Islamic way, by pointing to the fact that modern science is a double-edged sword. It performs "miracles" in medicine while facilitating the death of millions of the unborn, to which such a Western authority as Pope John Paul II was referring when he spoke of the spread of the "culture of death" in the West. Modern science has brought about many successes in agricultural production, while being directly or indirectly the cause of many more mouths to feed. It has purified the waters of the cities in the West, while causing the pollution of their air. And this is not even a question of a balancing act, for, if things continue as they are today, there might be no human beings around during the next century to praise the glories of modern science. Such a tragedy can occur not only from science enabling man to transform his dagger into a nuclear bomb without having gained any greater control over his passions, the *nafs al-ammārah* of the Noble Qur'ān, but even more so from the so-called peaceful use of the applications of modern science that, combined with the human greed that is not the monopoly of any one people, are waging a most relentless war upon the very natural environment created by God which

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(eds.), *Islam and Ecology* (London and New York: Cassell, 1992) and Richard Foltz, Fredrick Denny and Azizan Baharuddin (eds.) *Islam and Ecology* (Cambridge: Harvard University Press, 2003).

nurtures us and that has enabled us to live as human beings until now.

4. Another important step is to revive the traditional Islamic sciences whenever and wherever possible, especially in such fields as medicine, pharmacology, agriculture, and architecture. Such an act would not only give greater confidence to Muslims in their own culture but also have immense social and economic consequences. Moreover, they would remove to some extent the monopolistic claims of modern science and technology. Even in America, as already mentioned, non-Western forms of medicine are spreading rapidly, including acupuncture and Ayurvedic medicine. How strange it is that Islamic medicine, one of the richest in the world, is still absent from the scene and disdained most of all by the majority of physicians from the Islamic world itself! But certain realities cannot be denied forever. At last, an association for Islamic medicine is being created in America by Muslim physicians and one hopes that this will cause those who are forever mesmerized by what is going on in the West to begin to take the traditional Islamic sciences more seriously.

   In this domain Pakistan and Muslim India, which have kept Islamic or so-called *Yūnānī* medicine alive to this day and founded such successful institutions as the Hamdard centers in Karachi and Delhi, should serve as models for other Muslim lands. One can hardly over-emphasize the importance of the role of the revival of the traditional Islamic sciences in *Dār al-Islām* in creating a bridge between the traditionally-learned scholars and practitioners of modern science and as one of the major means of reviving the function of science within the Islamic intellectual universe.

5. One of the most important steps that must be taken to create a veritable Islamic science is to re-wed science and ethics, not through the person of scientists, but through the very theoretical structures and philosophical foundations of science. As already mentioned, there is no logical link in the modern Western world between science and ethics, because the prevalent ethics, which is primarily Christian, corresponds to a worldview that has been supplanted by that of modern science. As for the scientific humanism anchored in the ever-changing human nature, its impact even in the secularistic West is not extensive as far as creating a viable ethical alternative is concerned.

   The result of this situation can be seen in the environmental crisis, in which all attempts to create and apply an environmental ethics while simply accepting the scientific view of nature as being alone real have had little effect on the continuous destruction of the natural environment. What is needed is a knowledge of the cosmos that is congruous and shares the same universe of meaning with ethical norms, which are drawn in all civilizations from the religions which have founded them.[15] This is, of course, a task for Muslim theologians, philosophers, and ethicists, but must also be shared by scientists themselves. There is in fact no possibility of creating an authentic Islamic science which is not wedded to Islamic ethics in its worldview and philosophy but is related to ethics only by practitioners of science who may or may not be ethical personally without, in any case, their ethical concerns having anything to do with the sci-

15. This is a major theme of our 1994 Cadbury Lectures delivered in the United Kingdom, published as *Religion and the Order of Nature*, op. cit.

ence they produce. These questions become, in fact, even more urgent as new research in bio-medicine and bio-engineering now challenge the very foundations of all religious ethics, Islamic or otherwise.

A Word about Technology

The question of technology is vast and although it is related to modern science, it poses distinct problems of its own concerned with other philosophical, psychological, religious, social, and economic issues with which we cannot deal here save to emphasize its relation and at the same time distinction from the pure sciences. It is of course through its technology rather than pure science that the West has been able to dominate over the rest of the globe, and it is the power inherent in this technology that at once enriches and causes misery, and in which most Muslim governments are interested. But in the process of chasing and supposedly "catching up" with Western technology, as if that technology were stationary, Muslim countries have in fact made themselves ever more dependent upon the West.

The discord existing among Muslims is really disabling them even more because of its political and economic consequences. Take the case of Iraq. One battle in Iraq brings more wealth to certain Western companies (often from the treasuries of Muslim countries) than would be necessary to repair and renovate many old buildings in a city as large as Cairo, along with a few other places. Such a fact is the result of the consequences of not only lack of unity among Muslims but more than anything of reliance by Muslims upon one kind of Western technology, namely, modern military technology. The same is true in one way or another of many other forms of technology, ranging from the pharmaceutical to the nuclear. Muslim countries remain receivers of whatever the creators of modern technology choose to sell them, including left-over pharmaceutical products, and they have little choice when certain technologies, such as the nuclear, are denied them as a result of political considerations. The result is that most Muslim countries are more dependent

today upon the West than the people of the Northwestern provinces in Pakistan were during the last century upon the British when they were fighting against the latter's direct domination.

As we pointed out earlier in this book, in this domain as in science, it is necessary to develop the Islamic understanding of the parameters and factors involved in technology and its use. It must be recalled that nothing can be more anti-Islamic than an economics without ethics, which for Islam is directly linked to the *Sharīʿah*, the same is true for a consideration of immediate problems without a vision of what their proposed solution involves in the longer period and as it concerns Islamic teachings as far as man's relationship with God, society and also God's creation are concerned. Where are the Islamic critics of modern technology similar to those in the West itself, who have realized the profound dehumanizing effect of modern technology, from Heidegger and Louis Mumford to Ivan Illich and Theodore Roszak?[16] Even when voices rise here and there, they are hardly considered seriously, as the catastrophic situation of the environmental crisis in many areas of the Islamic world bears witness.

What is needed is an evaluation of modern technologies, even if all the choices are bad environmentally and so-

16. It is not to say that no Muslims have addressed this question, but one can hardly consider it as a main concern of the present day Muslim intelligentsia or as having serious effect upon the activities of Muslim governments despite the writings of a number of Muslim scholars, such as Hasan Hanafi, Parvez Manzoor, and several Muslim scholars who have been associated with Third World Network. See for example their *Modern Science in Crisis* (Penang: Third World Network, 1988). See also *Proceedings of the International Symposium on Science, Technology, and Spiritual Values—An Asian Approach to Modernization* (Tokyo: Sophia University and the United Nations University, 1987), which is concerned with Asia in general but includes a number of essays on the relation between technology and Islamic society by Muslim scholars.

cially speaking, and to select at every situation what is least disruptive of the patterns of Islamic social and individual life and least destructive of the environment. Economic considerations alone are not sufficient. Whenever possible, in fields ranging from agriculture to architecture, traditional technologies of the Muslims—which are often less costly and more culturally integrated into Islamic patterns of life—must be preserved and revived without any sense of shame before the technological onslaught of the modern world which, if continued, cannot but result in the collapse of the very system that supports human life here on earth.

There must be also as much effort as possible exerted to develop less disruptive alternative technologies, such as solar energy, and not wait for the day when solar cells made in the West for a few dollars will be sold to Muslim countries for hundreds or thousands of dollars. In this difficult and treacherous minefield of the use and application of modern technology, where organizations such as the World Bank and IMF followed policies during the 1990s that were directly related to the destruction of the Amazon rainforest and the ozone layer in the atmosphere, Muslims must have their gazes always fixed upon the Islamic teachings concerning the trust (*amānah*) placed by God upon our shoulders to protect not only other human beings but the whole of the earth. Islamic environmental ethics must be revived in the context of the *Sharīʿah* and the Islamic view of nature on the basis of the Noble Qurʾān and numerous writings of Islamic sages and seers over the ages, and the two must be made the guiding principles and the framework for all technological adaptations and development beyond blind emulation and even immediate human interests, not to speak of the tragic demands of greed that casts its shadow so strongly in this debate.

Concluding Comments

In conclusion, it is necessary to repeat that any science which could legitimately be called Islamic science and not be disruptive of the whole Islamic order must be one that

remains aware of the "Vertical Cause" of all things, along with the horizontal, a science that issues from and returns to the Real (*al-Ḥaqq*), Who is the Cause of all things. Such a science has been cultivated by Muslims for over a millennium. It must now be resurrected and the Islamic philosophy of science and the Islamic worldview reformulated in a language understandable to contemporaries and, in their light, modern science must be both critically appraised and judicially absorbed into the Islamic intellectual universe. After this occurs a new chapter can be added to the already illustrious history of Islamic science.

If an authentic Islamic science could be created upon the basis of the traditional Islamic science, while absorbing those elements of modern science that correspond to some element of reality, be it only the physical, a major step would have been taken for the authentic revival of Islamic civilization itself. Moreover, Islam's refusal to accept the divorce between religion, science, and philosophy, as well as between science and ethics, could have the deepest consequences for the whole of humanity now standing before the abyss of annihilation caused by the application of a science based upon the forgetfulness of God by modern man who has, moreover, also forgotten his role of protector and steward of His creation.

Only a science that issues from the Source of all knowledge, from the Knower (*al-ʿĀlim*), and that is cultivated in an intellectual universe in which the spiritual and the ethical are not mere subjectivisms but are fundamental features of the cosmic as well as the Metacosmic Reality, can save humanity today from this mass suicide that parades as human progress. Let us hope that in these dark hours of human history, the Islamic world, as the bearer of the message of God's last revelation, can rise to the occasion to create a veritable Islamic science which would not only resuscitate this civilization but also act as a major support for all those over the whole globe who seek a science of nature and a technology that can help men and women to live at peace with themselves, with the natural environment, and, above

all, with that Divine Reality Who is the ontological Source of both man and the cosmos.

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Index

D

E

F

J

K

L

M

N

O

P

Q

R

S

T

V

W

Y