Islam and science are the two most powerful forces in the lives of more than one billion Muslims now living on planet earth. Islam is the foundation of their spiritual life; it is the spring which nourishes the spirit, a moral code that guides actions and a repository of rites and rituals that regulate individual and social life. Science—and its utilitarian sister, technology—shapes the living space in which most contemporary Muslims function and carry out their daily routines. I wish to draw your attention to the interplay between these two entities which together constitute the dynamics of Islamic civilization.

The Qur’anic revelation is the living source of the Islamic civilization. Now for more than fourteen centuries, this divine spring of guidance has directed the individual and communal life of the Muslim community. The practice of the Prophet of Islam is the second source of things Islamic.

I do not wish to dwell on history. My concern today is with our contemporary realities, for the task that awaits us Muslims demands urgent attention. Hence, let us start from that point in history which has a direct relationship with our situation today. This point is the time when the Islamic civilization faced its most serious challenge. It came from that small part of Europe where modern science was born in the post-Renaissance era. This was an all-comprehensive encounter which posed threats and challenges to the Islamic civilization at all levels: social, political, intellectual, economic and religious. The outcome of this rendezvous is still not conclusive, though at the dawn of the twentieth century, it seemed that the encounter had been decisively won by the West. By then, the European powers had completed their conquest of almost all the Muslim world; at that time independent Muslim states existed only in Central Arabia, Iran, Turkey and Afghanistan and they too were weak and under the influence of the European powers.

Why Muslims were unable to check this invasion is a complex question; its discussion would take us away from our present subject. But let us note in passing that these military campaigns were battles between unequal sides: Muslims were at the receiving end because of their stagnation in the preceding centuries—a time when Europe went through a formidable scientific and technological revolution. However, let us also note that these victories were not easily won by the European powers. There was heroic resistance. In different Muslim societies, different patterns of resistance emerged. In the Indian subcontinent, for example, the first front of resistance was offered by the forces of Ahmad Baréîvi who suffered a crushing defeat in 1831. One of his students, Mir Nithār ‘Ali, generally known as Titū Mir (1782-1831) established his own movement in Bengal by organizing Muslim peasants; he, too, was killed in a clash with the British forces in 1831. Ḥajjī Shari‘at Allāh (1764-1840) is another figure in this
Muzaffar Iqbal

resistance. He started Farā‘diyyah movement in Bengal with considerable success. His son Dīdū Miyān (1819-1862) created what was essentially a short-lived independent state; he was arrested in 1847. Ten years later, a large scale war was fought to drive out the British. Likewise, in Southeast Asia, a series of wars were fought to resist the Dutch control. These were led by ‘ālamā‘ in some cases, as with the Padri Movement, the aim was to reform and purify the society as well as to get rid of the colonial power. Your country suffered for four hundred and forty-six years under the colonial rules of the Portuguese, the Dutch and the English. You fought a long and heroic battle and eventually won freedom. In Algeria, the resistance front against the French was organized by ‘Abd al-Qādir (1808-1883) and a war was fought for two decades. After his defeat in 1847, a number of smaller movements emerged. The Sanūsī movement in North Africa, and especially its activities in Libya, the resistance movements in Dagestan in Russia and the emergence of short-lived Muslim states in the Chinese provinces of Kansu and Yunnan all testify to the fact that Muslim societies did not give way to the colonizing forces without resistance.

Nonetheless, the Muslim world was colonized and the most powerful tool in this process of colonization is generally considered to be western science and technology, although this assertion is open to questioning. Once colonized, Muslim societies were transformed at the most fundamental level by the replacement of their basic institutions, models, heroes and, in most cases, the language of learning. Following the conquest, assimilation or annexation, the colonized societies were subjected to a reign of terror. Old and established families were uprooted. Leading figures were executed or exiled, ruling classes and people of wealth and fame were made targets of special retribution. The continuity of institutions was disrupted and in many cases, they were destroyed in both the physical and the functional sense.

After this period, which varied in length in different societies, new institutions were planted, a new administrative system was designed, and in time a new elite was created. This elite group was more than willing to cooperate with the colonial rulers. Educated in the new educational system, these people had little or no knowledge of their history and heritage. Intoxicated by the glamour of their rulers, men and women of this elite group considered it an unbounded honor to speak the language of their colonial masters and think and act like them. They accepted the ideas presented to them by their Western mentors without any critical analysis. Their personalities and worldviews were shaped by the teachings of Western philosophers, and religion had little importance for them. The members of this elite group slowly became the leading figures in most of the colonized societies and the masses started to look toward them as their models.

The third phase of this process started with the second generation of the elite group. Raised in luxury and comfort and twice removed from the traditional sources, this generation was also removed from the period of terror and violence and was able to seek equality with the Western rulers. Some of them went to Europe for education and their experiences in the West contributed towards the development of a sense of their own self-dignity and equality with the colonizers.

This was the broad historical pattern. Of course there are exceptions to this pattern but for our purpose today, they are not significant. Within this broad framework, the transformation of Muslim societies took various forms in different countries. The following changes, however, affected Muslims all over the world.
The first and the most obvious was the political transformation. Throughout their history, Muslim societies had functioned as units of a larger community. This concept of community (Ummah) transcended national, tribal and regional barriers and worked as a basic operating entity, which provided the framework for a unique spiritual and ideological orientation. This is not to say that many individual states or empires did not function as independent political and administrative units at certain times or that these states had no rivalry with each other. What is important is the fact that the transnational notion of the Muslim community as a whole superseded these regional units. In addition, there were certain operative mechanisms for fostering a pan-Islamic worldview. First of all, the two sacred cities, Makkah and Madinah, were held in great esteem by all Muslims no matter where they lived. These cities and the sacred rites of Hajj and ‘Umrah fostered a spiritual unity. Then there were certain centers of learning that were open to all Muslims; these nourished the intellectual tradition. Through these constant interactions, the transnational concept of Ummah was further strengthened. When the scholars and pilgrims returned to their respective regions, they had a knowledge of developments in other regions. These centers also provided a forum for resolving issues that affected the whole community. In addition, the trade routes which ran through all the Muslim societies were open to caravans from all places and there was a regular link among communities of Muslims living in diverse environments.

During the colonial era, this transnational concept of Ummah was replaced by another operating concept that was characteristically western in its origin. This new concept was that of nationalism which gave rise to the idea of state as a basic political unit, defined by concrete boundaries. This change was much more than a mere theoretical formulation; it had far-reaching implications for the Muslim world. The spirit of nationalism is based on cultural and linguistic grounds. In the West, this concept gave birth to distinct political units that were, by and large, defined on the basis of language, culture and geographical boundaries. These states demanded loyalty from their citizens in the name of patriotism. For instance, the foremost duty of a Russian was defined as loyalty to Russia, and for a German it was loyalty to Germany. Islam does not recognize any such fragmentation of humanity on the basis of culture and language. The emergence of nationalism in the Muslim world during the colonial rule produced, for the first time in their history, an idea which divided the Ummah on national and regional grounds—a division from which they are still suffering. This division gave rise to numerous countries in the Muslim world and created nations and states out of what was a community of believers. It divided them and produced a situation where this community is at war with itself.

The second change, which affected the Muslim world deeply, was the position of the Arabic language. Being the language of the Qur’ān, Arabic had achieved the status of lingua franca in the Muslim world. In countries where it was not the usual spoken language, it was commonly taught at the elementary level and those who continued their studies beyond the basic level, invariably learned it as the language of scholarship. This shared language was the single most important vehicle of communication in the Muslim world. Thus it was possible for an Indian Muslim, for instance, to communicate with his Egyptian trade partner or fellow student in a language that was not foreign to either of them. More than the mere language, it was also a sharing in the flow of ideas, concepts, technical terminology, metaphors and parables. It was as if a river of wisdom and the teachings of the ancestors nourished generation after generation in all regions of the Muslim world. The colonial rulers
replaced this with their own languages and, within a short span of time, in countries where Arabic was not the mother tongue, this river of ancient wisdom and a vast and formidable scientific and literary tradition became an inaccessible alien entity.

This change produced two effects: it destroyed the vehicle of communication among various Muslim communities and, in those countries where Arabic was not used as a spoken language, it made the Qur'ān and the vast corpus of traditional knowledge inaccessible to even the educated class. Thus removed from the language of the Divine revelation, Muslims in these countries were left with no defense against the onslaught of Western ideology.

The third significant change in the colonized societies was the replacement of the traditional system of education by the Western educational system. In the Muslim societies, the governing principle was Unicity of God (tawḥīd) and submission to His Will and thus education in the Muslim world started with the learning and memorization of the divine Word, it progressed in degrees to prepare the student for a life of piety and observance of the Divine Law. In its advanced form, Islamic tradition of learning included various branches which functioned within a hierarchy wherein astronomy, medicine, mathematics and various other disciplines existed in an interrelated form and in harmony with each other. The set of beliefs forming the core of Islamic teachings was operative in the development of curricula. The universe was created by an omnipotent God, it was subject to His Will, it was created with a purpose, there was an end for it and a Day of Reckoning. Knowledge was acquired in a manner that required a period of apprenticeship, reverence and respect for teachers and it was not an end in itself, but a means. It was not linked with the gains of this world and least of all with jobs in the administrative system. One learned because it was an obligation (fard) and for the sake of understanding the nature of this life and the universe.

All of this was replaced, with far-reaching ramifications, by the Western educational system which had evolved, after the seventeenth century, out of a worldview in which Man, rather than God, held the center stage. This educational system became increasingly secular in the following centuries and by the time it arrived in the Muslim world, it had lost all sense of purpose and direction. It was geared toward the production of good citizens for the nation-states, rather than exemplary human beings whose foremost concern was with the ideals of a revealed religion. This system took, as its starting point, a defiant stand against the traditional worldview which accepted certain metaphysical truths as fundamental and inalienable parts of the human condition. It operated within a religious order of nature in a cosmos created by an All-Knowing and All-Wise God to Whom everything belonged and to Whom everything was to return.

But the new universe that came into being after the European Renaissance had no such foundation; it may have been created by God or it may have evolved on of its own. It may have purpose or it may not have any purpose; it was left to man to determine this through science. It was a universe in which Darwin and the Church Fathers were treated equally and the function of education was to prepare the student for an impartial inquiry, not necessarily based on Faith. This system was invariably linked with the availability of, and qualifications for, the jobs in the state or private enterprises.

The introduction of this system in the Muslim societies attacked their most
basic beliefs and produced a generation of educated men and women who had little knowledge of and far less commitment to their religious beliefs. They served in the colonial administrative systems as low-ranking agents of implementation of the colonial agenda. This educational system is still operative in the Muslim world and it is still producing men and women who see the purpose of education as nothing more than a means for good jobs.

The most important aspect of this colonial era is related to the fate of the Islamic tradition of learning, of which the Islamic scientific tradition was an integral part. During the colonial era, a transformation took place that made the living entity—which used to shape, define and govern the worldview in the Muslim world—into a heritage; a heritage consisting of manuscripts hidden in the inaccessible recesses of European libraries. In time, this dead mass became a memory of certain names that reminded one of cemeteries and tombs, rather than living humans of extraordinary genius.

But this was not all. After the colonization, a judgment was pronounced on Islam and Islamic civilization by the victors. Bluntly stated, this judgment was this: Islam was a religion which had its day but which was not suitable for the modern world; it was a religion that was inimical to progress, which was identified with science and technology. As for the Islamic civilization and the tradition of learning, it was grudgingly accepted to have been the harbinger of the Greek heritage, but merely that. The more liberal among those who passed these judgments went a step further and admitted that Muslim sages and scientists did tinker with the received knowledge which, in any case, belonged to Europe.

This judgment was repeated, almost incessantly through a vast and painstakingly constructed tradition generally called Orientalism. This tradition produced such “authorities” as Goldziher, Schacht and their numerous students. These Orientalists had access to hundreds of Islamic texts in manuscript form which had been stolen or bought cheaply in the bazars of Cairo, Baghdad and Damascus and brought to Europe. The Orientalists used this material to produce a vast corpus of literature which advanced this same judgment with great erudition. Their verdict left nothing untouched, not even the most sacred sources of Islam. Thus they “proved” that the Hadith literature was at best suspicious, at worst mere fabrication and in all cases unreliable. They rearranged the text of the Qur’ān to make it more “readable”. They discovered, edited, translated and catalogued a large number of Arabic and Persian texts with such erudition that no one could doubt their scholarly authority, least of all the colonized masses who had by then been thoroughly demoralized and had become bereft of their own once-living tradition.

However, in retrospect, it is not the Orientalists’ judgment itself that is the most painful and devastating aspect of this whole affair; it is the acceptance of this judgment by Muslims that is the cause of our deepest concern. For in time, Muslims themselves came to regard their past as a heritage upon which they looked with the tainted glasses provided by the erudite studies of the Orientalists. The more daring among them challenged certain assertions of western scholarship but only to claim that there was, in fact, a “golden age of Islamic civilization” during which it was the supreme civilization. Others went a step further; invoking the name of an Ibn Sīnā, or a Rāzī, they attempted to prove that Islamic civilization did have its great scholars, sages and scientists. But in general, all of this was spoken of in the past tense, as if it was all over, buried in the
past and merely a matter of honor and pride; no one was interested in reclaiming this veritable tradition, they were all interested in inheriting it.

Thus stultified, this invocation to the past glory did nothing but soothe the burning pain of that generation of Muslims who came just before the end of the colonial period. For when the struggle for independence started, its point of departure was based on the transformed societies which were already looking toward the West for guidance and help. Most leaders of these movements were actually the products of the Western institutions. They had already accepted the judgment and everything that came with it: the state as the basic operating unit, their own nation as the alpha and omega of their political ambition, western-style education including its science and technology as the mantra of progress, western political and economic institutions as the operating apparatus of the state and the western judiciary as the system of justice. Thus independence was essentially a change of rulers rather than ideologies.

When the first phase of independence was over, the Muslim masses realized that their struggle had changed little in their lives. This led to a widespread resentment followed by a series of coups and changes of governments through mass uprisings. This produced political instability. In the sixties, this instability gave rise to a series of “revolutions”. The most frequent label for these so-called revolutions was “socialism”, though often with some qualitative adjective like “Arab” or even “Islamic” attached to the label. By the mid-seventies, this trend had also lost its force without affecting any major change in the fundamental structure of the societies. These successive experiments with alien systems made it clear to the masses that they must return to their own process of evolution, based on the teachings of Islam. This gave rise to the present trends of resurgence of Islam in the Muslim societies.

But even within these movements, little has been accomplished in terms of understanding the nature of western science. For the most part, modern western science was accepted without any critical evaluation of its philosophical foundations, its claims, its goals and its ultimate worldview. The nineteenth century illusion of science being a value-free, objective discipline became the reigning paradigm in the Muslim world, and it remains so, even after its demise in the West. This blind acceptance begot an equally blind demand for science. From the political leadership to the reformers and from the common man in the street to the opinion leaders, everyone agreed that the Muslim world needs to catch up with the West in science and technology. I recall the most recent resolutions adopted in this very city by the Organization of Islamic Conference which repeated this broken record as part of its routine repetitious and fruitless calls which have been making rounds since the early eighties. In fact, the mantra of the political leadership in countries as far apart as Morocco and Pakistan and the writings of the opinion leaders throughout the Muslim world—all incessantly demand more and more science. It is another matter that in their blissful innocence, they confuse technology with science and even when they mean science, they usually mean the applied sciences. Thus, it is not surprising that in public discourse about science in the Muslim world, the phrase most often used is “science and technology”, in one breath, without a pause.

This is not a new situation. Since the time of the nineteenth century modernist reformers, the general opinion in the Muslim world has been that the West was able to advance and colonize almost the entire Muslim world because of its science and technology, both spoken of as if they are one. This line of thought has given birth to the
“catching up syndrome”—the idea that as soon as the Muslim world acquires science and technology, it will catch up with the West. This has been articulated over and over and with such regularity that it has become the gospel of development strategies.

Considering the global impact of modern science, perhaps it is not unwarranted that Muslims should be so enthralled by it. In addition, there are the obvious needs of contemporary Muslim societies which force reliance on western science and its products. These range from genetically altered seeds to telecommunication, from defense needs to pharmaceuticals and from consumer goods to essential chemicals. In fact, for all practical purposes, the whole of the Muslim world, comprising one fourth of human beings now living on planet earth, is utterly dependent on the western science.

This dependency is not the artificial dependency of the elite for consumer goods; rather, this is a fundamental dependence on western science in almost all areas of life—from agriculture to pharmaceutical products and from communication to industrial chemicals—is increasing. In this, the Muslim world shares its predicament with other non-Western countries.

Perhaps this is not surprising. Taken as a whole, modern science is a unique enterprise. Though ultimately a product of Western civilization, today modern science and its more utilitarian offspring, technology, is eagerly sought by all cultures. But more than this hunger that modern science has produced in other cultures, it is its sheer transforming force that interests us here. In its triumphal march during the last two centuries, modern science has been able to obliterate all other ways of exploring nature, at least in a practical sense. One does not need years of research to verify this aspect of modern science: from Islamabad to Jeddah and from Beijing to Niamey, contemporary scientific research is conducted on the same foundations throughout the Muslim world as it is in any Western university or research laboratory. Obviously, just because an NMR spectrometer has been installed in Makkah does not make its spectrographs Islamic, nor does the presence of thousands of Muslim scientists in European and North American laboratories make their research Islamic science.

It is this extraordinary universality of modern science which makes it a unique and unprecedented phenomena in human history. The sheer magnitude of its reach, its ability to penetrate cultures as different as Islamic and Hindu, Chinese and those of the North American aboriginal people, has no parallel in human history. Both the manner in which modern science has been able to obliterate all other ways of studying nature and its irresistible appeal are unique to this modern enterprise which arose in a small part of Europe in the seventeenth century, and which has since been able to penetrate the whole human habitat.

Arising out of a complex process of appropriation, transformation and assimilation of Greek and Islamic scientific traditions, modern science broke away from both of these traditions in many fundamental ways. In its abstraction and mathematization of nature, modern science not only attempted to describe and explain nature, it also formulated its own “theology of nature”. It gave birth to its own language and culture. It has produced a community of scientists who belong to all races and religions, but who share ideas and theories in a language made up of symbols and notations. They can discuss the origin and evolution of cosmos and life on the basis of a shared mathematical understanding; they can interact through equations.

The fact that electrons, atoms and molecules on the one hand, and gears, levers
and beams on the other, have become universally accepted words in which contemporary scientists and engineers as well as ordinary citizens of various nation-states communicate and conduct their daily business all over the world is indicative of the vast reach of the scientific enterprise. This universality of modern science is a fait accompli, whether one likes it or not.

If history can be our guide, it does not seem possible to return to a concept of matter—and ultimately of the whole universe—which is built upon the pre-seventeenth century notions of matter, space and time. Whatever judgment we may choose to pass on modern science, there is no escape from it. Even in the domain of non-western medicine, where results of alternate philosophies of human body and its maladies and treatments have been effectively demonstrated, modern western medicine is rapidly replacing traditional practices, thus causing an irreparable loss for the whole human race.

In the West, the rise of modern science has been accompanied by serious theological reflections by a whole range of theologians from all denominations. This has produced an impressive amount of literature that deals with issues related to various aspects of Christianity and science, a subject that has always been part of the western tradition in one form or the other. From Augustine to Newton, every major philosopher and scientist has reflected on the implications of scientific discoveries on their faith.

Briefly stated, the defining questions of contemporary science and religion discourse in the West revolve around a central core: The questions related to the origin of cosmos and life formulated in such disciplines as cosmology, quantum physics and evolutionary biology; the questions arising from the concepts of Nature: Is Nature merely a huge coagulate of purposeless matter that has somehow emerged on the cosmic plane? Or is there any teleology observable in natural phenomena? Does God act in the physical world? Are natural causes sufficient to explain everything—from a thunderstorm to the formation of galaxies? What is the nature of miracles?

During the last fifty years, a renewed interest in the field of science and Christianity has produced a large body of scholarly responses and interactions which seek to build bridges between science and Christian theology. This is not to deny the fact that there are scientists who advocate the principle of Non-Overlapping Magisterium; implying that science and religion belong to two separate domains and the twain shall never meet. But with time, this position has become marginal and a majority of scientists and theologians now seek to build bridges between science and religion, affirming that these two domains have an intrinsic relationship because they deal with the most fundamental aspects of life, nature and the cosmos.

But how do these issues relate to Islam and Muslims? Is the relationship between Islam and modern science a legitimate subject of inquiry? Or is it one of those subjects which have come to the Muslim world through its encounter with the West as foreign entities—issues which lose all legitimacy when placed within the matrix of Islamic thought?

In comparison to the sophisticated and mature discourse on science and religion in the Christian tradition, one finds nothing comparable in the Muslim world. What one does find, however, is an alarming trend which attempts to find every single modern scientific discovery in the Qur’ān. This has given rise to mountains of apologetic literature which ranges from the enormously popular book of the French Muslim
physician Maurice Bucaille, *The Bible, the Quran and Science*, first published as *La Bible, le Coran et la science*, in 1976 and since then translated into every language spoken in the Muslim world, to hundreds of websites which attempt to prove that the Qur’ān is, in fact, the word of God because it contains scientific theories and facts which modern science has only recently discovered.

From the perspective of the Islamic scientific tradition, this situation is something of an historical anomaly. During the centuries when science was an actively pursued discipline within the bosom of Islamic civilization, its relationship with the Islamic worldview was never even a question: Islamic scientific tradition had emerged from the same ethos which had given birth to other fields of knowledge and it was fully integrated into the hierarchy of Islamic thought. Ibn Sinā would have thought it absurd to conceive of “Islam” and “science” as two separate entities. For even when foreign currents were introduced into the Islamic scientific tradition, they were assimilated through an organic process of transformation. That which could not become Islamic, remained outside the domain of Islamic polity as a foreign entity. But this was during the time when the Islamic scientific tradition was itself a living entity; this is no more the case: whatever science exists in the contemporary Muslim world is just like the science in the West. Even the much cherished and useful science of Islamic medicine has almost disappeared. Consequently, questions raised by modern Western science, as a transplant in the Muslim world, are entirely different from those which arose naturally within the Islamic scientific tradition during the centuries when it was a living tradition. These new questions require a new methodology and a new language of discourse.

Let us note that whereas in the West, it is theology that has been poised as a counterweight in the Christianity and science discourse, the same cannot be the case for Islam. For a meaningful discourse between Islam and modern science, Islamic theology cannot be expected to play the same role because in the Islamic tradition, theology deals with a different subject matter and its status is not like that which it has in the Christian tradition. The principle theological debates in Islam have ranged from the nature of God’s attributes to the nature of Heaven and Hell; free will and predestination; nature of reward and punishment and the like. Thus, Islamic theology would be a poor counter-weight for science in any discourse on Islam and science.

For a creative exploration of the relationship between Islam and modern science, one needs to examine it from the perspective of the Islamic concept of nature taken as a whole and within its own matrix which is based on the revealed text, the Qur’ān. This is not an easy task because as soon as one brings the revealed text into the contemporary discourse, there appears to be a hardening of attitudes and closing of doors because the science-religion discourse in the West is construed in the framework of theology and science and not in terms of the Bible and science, at least not in the mainstream. But perhaps the worst impediment is the parallel that is more likely to be drawn between such a stance and the presence of a fundamentalist strand in the West which posits the Bible as a counterweight in the science-religion discourse: a strand that is despised in the academic world. However, notwithstanding this difficulty, one cannot think of a genuine Islam and science discourse which is not rooted in the Qur’ān.

Likewise, the Islam and science discourse cannot attain any degree of authenticity without its roots going back to the Islamic scientific tradition. What was Islamic in Islamic Science? How was the Islamic scientific tradition rooted in the Qur’ānic worldview and whatever happened to that tradition? Equally important are the
epistemological considerations concerning the status of the Qurʾān in relation to modern science and the nature and meaning of the so-called scientific verses of the Qurʾān. Similarly, the Islamic understanding of the physical cosmos, God’s relationship to the created beings and the Islamic concept of life and its purpose are essential to any meaningful discourse on Islam and science.

Equally important for the discourse is an examination of the process of appropriation and transformation of the Islamic scientific tradition in Europe. This is so because one needs to look at the foundational structure of modern science and the relationship of its underlying philosophical structure to the Islamic worldview. All of these elements form the warp and weft of the Islam and science discourse.

It will not be an overstatement to say that this is an essential task which needs to be undertaken by a large number of Muslim scientists who are deeply rooted in various Islamic sciences. But contemporary Muslims scientists are, by and large, a product of western style secular institutions. They do not receive any formal training in Islamic sciences and their knowledge of Islam’s formidable tradition of learning is next to nothing. Islamic scholars, on the other hand, generally remain oblivious to modern science. They have neither the academic training, nor the intellectual skills, to discuss the relationship between Islam and science. As a result, this discipline has remained underdeveloped. It is not even taken seriously, though considering its vast reach and impact, it is not merely an academic exercise; it is an essential imperative. After all, modern science is the most powerful and successful enterprise in the entire human history. It seeks to redefine the very notions of human and cosmic destinies. It has created several strands of its own pseudo religion that range from Darwinism to agnosticism and it has opened several new domains of ethical and moral concerns through advances in such fields as genetics and neuroscience. But above all, it is the triumphant force of modern science that seeks to replace all worldviews other than its own which needs an urgent and creative response by Muslim scholars.

This is not to suggest that the Islam and science discourse is a totally virgin territory. In fact, from the time of the nineteenth century Muslim reformers to our own, there has been a steady stream of reflection on the nature of modern science and its relationship to Islam. What has been mentioned so far is the fact that most of this literature has an apologetic ring to it and it has been generally produced by scholars who had very little understanding of the philosophical foundations of modern science. All they saw was the triumph of modern science, the colonization of the Muslim world and, in all sincerity, they desired to redress the situation. These early Muslim reformers lived, thought and worked in very difficult conditions. Most of the Muslim world was still under colonial rule and the reigning dictum was that Islam was an outdated religion, inimical to modernity, science and progress. This was not merely an unstated under-current; there are scores of works by leading Western thinkers who had derided Islam in a very aggressive manner. Hence the task these Muslim intellectuals took upon themselves was to defend Islam and somehow prove its continuous validity; a task they accomplished as best as they could.

This situation improved considerably during the second half of the twentieth century. Political freedom, a better understanding of modern science, a deeper grounding in the Islamic tradition of learning and a host of other factors have given birth to a small body of mature literature on the relationship between Islam and modern science. It is this small body of literature that deserves greater attention and hopefully
conferences like this would help to nourish this literature by establishing a fraternity of scholars and scientists who are equipped to examine the questions and offer solutions.

One of the hurdles that we have faced in the past is a negative label that is quickly affixed to any exercise of this nature by a handful of scientists who see the examination of science from an Islamic point of view as an anti-science exercise. This has happened in the previous three conferences on the subject which were held in Pakistan. This is really a very unfortunate trend. Let me state it in as clear terms as possible that exploring the relationship between Islam and modern science is not a movement to take us back to the medieval ages, as the opponents of this exploration allege; nor is it an attempt to censure science. How could we pass a verdict on a discipline that has the potential to unravel the mysteries of God’s creation—a task that is enjoined upon us by the prime source of our faith, the Qur’an?

I hope it is abundantly clear that the task ahead is nothing but a complete and thorough examination of modern science from an Islamic point of view. This is not merely an academic exercise which should be the prerogative of a small elite. This is an essential task for the survival of the Islamic civilization, for the reach of modern science is not limited to the laboratories and libraries. Through advances in information technology, genetic engineering, biotechnology, neuroscience and other advance areas, modern science has become such a fundamental part of our lives that no one can escape its effects. At the same time, the examination of modern scientific enterprise is a highly complex affair. It involves philosophy, economics, culture, semantics, metaphysics, even politics.

Let me give you a concrete example to illustrate what I mean. A few weeks ago, the prestigious magazine *Nature* reported that a new variety of rice, called the Golden Rice has made its debut. This Designer rice is supposed to combat diet deficiencies. [Nature, 409 (2001), 551] But according to *Nature*, “the Golden Rice project was promoted by Potrykus, who wanted his research to help combat the vitamin A deficiencies prevalent in many poor countries, particularly those relying on rice as a major food source. Rice plants do not normally produce carotenoids, vitamin A precursors, in the grain. A ‘humanitarian board’ made up of the two inventors and representatives of the Rockefeller Foundation, the World Health Organization and the biotechnology industry, will oversee the distribution of the rice to the research institutes”. This rice has been sent to the international rice research center in the Philippines free of cost. The licence-fee waiver for this involved seventy patents from thirty-two companies and universities! Syngenta, the company behind the project, has also announced that it has completed the entire rice genome in the last week of January 2001.

We all know the road map from here to that not-so-far future when this rice would have replaced the traditional varieties. And because it cannot be used as seed for the next crop, a fundamental dependence will be created and in time, a whole region will become hostage to the dictates of a multinational company.

This is the practical side of this complex affair. On a more theoretical, but no less important side, we need to look at the reigning paradigms of modern science. You are aware that in the course of the twentieth century, we have finally freed ourselves from the tyranny of the notion that science is a discipline that merely discovers facts and then constructs theories to explain these facts. It has been amply shown that “facts
are theory-laden”. Or in other words, behind every fact there stands a theory and behind every theory, there exists a worldview and behind every worldview, there exists a belief which transcends both the facts and the theory. Thus, we recognize that not only are facts theory-laden, but theories also do not grow on trees; they are products of the human mind and are constructed in intelligible languages, and language curtails the thought within its own bounds, as Wittgenstein (1889–1951) tells us.

Recognizing that science and scientific language is ultimately a human activity, we must ask ourselves, “what are the ruling paradigms of modern science? How did they come into existence? What are the tacit assumptions behind these and are all of these in conformity with the Word of God.”

These are no mean questions; they relate to our deepest beliefs and concerns and they will dictate the shape of the Islamic civilization in the years to come. We all know of the devastations modern science has already caused through an unprecedented disturbance of balance in nature. Through dramatic alterations of nature, we have been able to grow tomatoes in the desert and we take pride in that progress but we do not acknowledge that by disturbing the pristine balance of the desert, we have dislodged so many toxic chemicals from its sand that the downstream water has been contaminated with heavy metals which find their way into the fish and ultimately in to the human body. We take pride in the power that modern science has given us in so many fields without realizing that this ability has been acquired at the cost of irrecoverable loses and it has been accompanied by such large-scale disturbances in the eco-system of our planet that there are no viable solutions to redress the problems that confront us today: think of mad cow disease, global warming, toxic bacteria, contaminated water and hundreds of new diseases that have been directly related to our adventures with nature.

Those who think that modern science and its sister, technology, will find cure to the problems they have created without the help of religion live in a world of illusions. Just as thought cannot get out language and fact cannot be independent of theory, a system cannot transcend its own boundaries. For all those who are concerned with the spiritual and physical well-being of humanity, the daunting task at this stage is to forge anew an inalienable link between the two formidable forces that shape our lives: science and religion. Only through such an inalienable link, can we hope to travel on a path that is rightfully ours—a path envisioned for the human race through a binding covenant that made us the vicegerents of God, the Creator of the whole cosmos Who chose in His infinite Mercy and Knowledge to place us here on this earth as trustees with enormous responsibilities.