

Beyond
Faith and Science



Dr. M. Manzur-i-Khuda



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Dr. M. Manzur-i-Khuda

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PREFACE

After being first brought to life in this world late in 1933, I first came to a knowledgeable understanding of it, only during the second world war early in the forties. I remember the times when my mother used to teach me arithmetic and the alphabets before sending me to my first schooling. The winter vacations that we used to take in a health resort, where my late father had built a wonderful bungalow with lots of fruit trees and a beautiful garden, was actually affectionately named after me as Manzur Kunja (Lodge). During the Japanese bombing of Calcutta we took refuge there, and then suffered the consequences of some of the most dreaded diseases of the time including a month in bed with typhoid. After the war came the anti-British movement, where even the school children actively took part by "strikes" and other protests. This was followed by the most deadly communal riots - a result of the "divide and rule" policy, and then came the eventual liberation, with partition of India. These early years saw me engaged in trying to solve some of the mysteries of Nature. I found out that a branch of Crouton plant will grow even in plain water, but required sunlight for its efficient growth and also to keep up the green colour (chlorophyll). I learned that the electric current as available from the electrical sockets when short circuited by the introduction of a wire can cause havoc, by fire and smoke and a deadly kick (DC outlet), which very nearly killed me. I even "discovered" that the starch solution left over after cooking rice can be fermented to produce a gas (methane) which will burn when ignited! Many of such innovative experiments designed and carried out by me opened up a thirst for knowing more about Nature and thus opened up the path for studying science later on in my life.

My father, Dr. M.Qudrat-i-Khuda, was the first Muslim Scientist to have obtained his D.Sc. from Imperial College of Science and Technology in London. On his return in 1929, he had to wait for quite a few years before being offered a position as per his experience and qualifications. But he utilised the time in presenting some research work, which gave him the much coveted Premchand Raichand award and with it a very substantial remuneration to keep him going. He published many books on Arithmetic, Bengali, English, Diniyat (Islamic studies) and Science (later on for

college and university) for the school children, offering them a more modern and efficient treatment for the studies. He had a strict routine in the busy schedule of his life. Up early before sunrise, and after prayers some busy time was spent in translating the Holy Quran, only the first two chapters were published by him, and the rest of the manuscript is still available. Morning exercises followed by a bath and breakfast, and a quick look through the Newspaper started his workday in the Presidency College with research and teaching. On return, a quick ablution, some snacks were followed by a session of study on his office desk. He had dinner while listening to the radio news and a more detailed study of the newspaper in bed, and then an early retirement. He discouraged wasting time with cinema visits or such other unproductive activities. We had very little conversation with him, and were quite happy to share his affections with a gratifying awe. Actually, he avoided unnecessary talk or gossiping, but loved company of children, and his grand children were very lucky to have him as a friend and well wisher. Even though he retired from service, as required by age (65 years), he was always busily engaged in serious effort for introducing Bengali as the media of teaching including science in the Universities. He has left behind him seventeen volumes of unpublished manuscripts, in addition to the many books on science in Bengali that was published during his lifetime (until 1977).

My grandfather, Hazrat Syed Abdul Muquit, was one of the first graduate of his time and was offered the position of a Deputy Magistrate by the British administration. He resigned only after one day of service saying, "I cannot have two masters". He devoted his life as a religious guide. He was known as a great spiritual leader and was respected by all. There are many stories of some of his miraculous abilities and public service. He advised by father never to join the Indian Civil Service or to become a police officer, both of which, he said, were the instrument of control by the then colonial British power.

This discipline of life and the guidance from the exemplary lifetime of my parents did play a role in my choice of career as a scientist. Religion was my right of inheritance, and became a source of inspiration much later in my life, when I realised that only material success or scientific search does not bring the success of life and the Hereafter. Even though I practised

religion with unquestioned faith, as a scientist, I found it very difficult to publicly practise or acknowledge it, until a much later time. In these quest of search for knowledge, whatever understanding have come my way, I would like to share with all. This humble presentation is only an effort to bring some of it in print.

I believe that both the knowledge of Science and Spiritual guidance comes from the same source. Being a student for religious understanding, the exact translation (Moulana Yusuf Ali) only has been used and comments or explanations of my own avoided. My own conviction of connecting all that we know through science, is reflected in the Guidance brought to us from the Creator through His religious teachings. I have quoted relevant texts from the holy Quran and left the direct or detailed understanding for this connection to the educated minds of the reader.

Friday the 3rd. March, 2000 AD
Dr.M.Manzur-i-Khuda
Dhaka, Bangladesh.

A synopsis of the presentation

Cosmic creation *ex-nihilo* with its scientific and religious basis and its formation in two stages is realised by the creation of micro-cosmic black ball, followed by a big bang. Expansion of the universe with the later developments of galaxies, planets and life carrying animals ending with human beings are well established. Religious and scientific developments, establishing the most important structure of the creation and the emergence of the modern society, are shown to establish the most important role of the human being. Creation of the universe reveals that human presence is an indispensable and integral part of it and our role as an observer is incorporated in the design of creation by the Creator Himself.

Realisation of the black ball, in the scenic Cosmic creation is not explained by physical science, which fails beyond the Planck constants (being the smallest indivisible units) of space and time. An explanation of formation by employing the general and special relative theories has been shown to be adequate in satisfying the scientific and religious basis of creation itself.

Intricate and fine structure of life defeats all scientific explanation. Material understanding within a socio-religious development establishes our Faith and the Hereafter, satisfying the need for our eternal soul. Development of life by evolution and revolution is supplementary and complementary to our understanding.

Nature itself is a manifestation of the Creator and is the miracle brought home through the choice of the natural constants. That show the path of our universe in which we live, and eliminates the millions of other possible ones. The ultimate goal of life and the eternal Afterlife, in the light of creation, brings with it the fulfilment of Faith and Science, exemplified by quotations from the holy Quran and scientific literature.

DEDICATION

In The Name Of God , Most Gracious, Most Merciful.

With utmost humility I wish to acknowledge Your Help My Lord in preparing the presentation herein. May this kindly be accepted By You - Rahmanur Rahim, as an apology for the Deliverance of all of us and my late parents: Dr.M.Qudrat-i-Khuda and Begum Anisa Qudrat-i-Khuda, for whom this humble effort is dedicated. Amen!

Dr. M. Manzur-i-Khuda

ACKNOWLEDGEMENT

The author wishes to gratefully acknowledge the kind comments and encouragement received from late Professor Abdus Salam F.R.S the great Nobel Laureate, on the papers published on the subject of Science and Islam, which appeared in the Journal of Islamic Thought and Scientific Creativity, Islamabad, Pakistan. These were subsequently printed as a book, " Creation and the Cosmos" by my daughter Mrs. Parveen Shama Q. Chowdhury. The present book, " Beyond Faith and Science" is being published as a follow up on the subject. I wish to thank my family and friends, particularly Mr.S.H.Kabir Chairman, Renata Ltd. for his help, comments, understanding and appreciation, and all others who encouraged me to present this publication. I am grateful to Mr. Alimur Rahman Khan for his patient discussions and valuable comments. I shall be happy if the thoughts presented herein appeal to the educated mind of my readers.

MESSAGE OF GOOD WISHES

I was happy to see the very interesting articles on Science and Islam written by my good friend Dr.M.Manzur-i-Khuda. During his brilliant academic career as a student, he always led the class and created some records for which we are all proud, His achievements in scientific research, now appears to have been topped with an equal understanding of religious faith. His practice in Islam is now crowned with a unique explanation of faith and practices, which he has effectively co-ordinated with the a Scientific argument giving us all a goal for this life culminating into a success for an eternal bliss for our immortal soul.

My thoughts of this material world did not always have the opportunity for a religious explanation, and his metaphysical explanations of our religio-scientific existence, of life and creation itself are not only scholastic in its approach but is highly laudable with its esoteric and prudent presentation. It has been a great pleasure for me to read them and appreciate the eminent logic of science in taking up the philosophy of religion for creating a conviction, complementary and supplementary to our value of life itself.

I am certain that whatever Dr.Manzur-i-Khuda has chosen to present will be a valuable guidance for our faith and scientific understanding. I pray that his pen may incessantly move on for many more articles and presentations in print to fructify our religious understanding.

S.A.Samad Ph.D (McGill), M.Sc (Dhaka)
Faculty of Science,
Oklahoma State University, Oklahoma.

FOREWARD -I

The inquisitive mind of human being is never satisfied with answers. The answers are always questioned; that leads to more questions - which end up with discoveries - called Science. Discoveries are the hidden treasures of Allah - uncovering of the covered world. For a believer it is guidance, for a disbeliever it is self-satisfying. Faith and Science should not be conflicting; rather science should bolster faith. When science contradicts faith or challenges the Creator, ill effects befall on mankind.

Faith is submission, science is omission. Faith does not want proof. Whereas science demands proof. If we can disprove what was proved yesterday, scientific achievement is realised. The misleading concept of yesterday's science even then do not lead us to faith.

The madness of thoughts is never ending - which either try to prove itself or get lost in the world of imagination. Human minds were created with limitations. We may think of figures or calculations but we will never succeed in going beyond those limitations. The million, trillion, trillion, trillion fine-tuning looks good on paper but make no sense to common minds, nor has any material yield. Faith on the other hand in a moment brings the sense of satisfaction, tranquillity and expectation. Going to the "Arsh of Allah" and coming back in few minutes thus gets accepted so easily by so many.

A scientist like Dr.Manzur-i-Khuda could easily get lost in the confusing world of science, but Allah has guided him. That is why in the midst of evolution, big bang, milky way, black hole and dark matter he found the revelations that go far beyond those imagination. In the world of faith, answers do not demand question but demand acceptance. Those who accept find guidance.

I am convinced, the readers of "Beyond Faith and Science" will seek guidance rather than pursue the imagination that has no end and make no sense!

May Allah guide me and guide all in the path of Faith. Amen.

M. Sirajul Islam M.D.,
Kissimmee, Florida,
USA

FOREWARD - II

Dr. M. Manzur-i-Khuda, gave me the manuscript to read and give my opinion about it, I felt deeply honoured and grateful. I have been in close contact with Dr.Khuda for the past seven or eight years. With my conversation with him, I had some understanding about the relation of science and creation.

In this book, he has taken an immense amount of time to make us understand the Creator ("Allah") through His creation; our faith will increase when we will understand the creation of the universe and creation of mankind. So-called "Western education" and "Darwin's theory" made a lot of people to believe in the "Theory of evolution" which was in contradiction of our faith. The author's explanation of creation and his explanation of most recent scientific understanding makes us understand the true theory of creation and perhaps some sense of relation between both the theories. The author also explains in great detail about creation of the universe, both in time and its process of creation.

He explains that to us, time is a fraction of what we understand with our limited view, but Allah (the Creator) can see from beginning to end of all. He knows everything, which is beyond our comprehension. With instances of great Muslim scholars, the author explains that acquiring knowledge is also our duty. We must acquire knowledge because it will give us better understanding of the Creator and His greatness. The more we understand the process, the more we can be sure that there is one who is giving guidance to the entire process.

Although this book may look like it was written for people of scientific education, anybody could read this book and comprehend it and gain scientific knowledge. I will strongly recommend everyone to read this book and benefit from it.

May Allah give the author many rewards for his sincere effort to make us understand the greatness of Allah.

Dr. Murad Khan Thakur,
Orlando, Florida, USA

Table of Contents

Subject	Page
Preface	i
Synopsis of the Presentation	iv
Dedication	v
Acknowledgement	v
Messages	vi
Foreward -I	vii
Foreward - II	viii
Introduction	1
Chapter-I . The Scenario of Cosmic Creation :	
The Universe	10
The Early Scenario of Creation	11
Creation <i>ex-Nihilo</i>	14
The Earth Scenario	18
The Quranic Revelations	20
Future Developments	22
Chapter-II. Time and Space-the Building Blocks of Our Existence:	
Evolution and the Earth	25
Evolution of Life	25
Human Body and Mind	32
Time Modulation	34
Structure of Space	38

Chapter-III. The Science of Reality :

The Quantum Theory	41
Role of an Observer	42

Chapter-IV. Religion and Society :

Social Evolution and Religion	48
Scientific Development and Faith	52
Development of Modern Science	55
Science in the Light of Human Progress	57
Science and Islam is a Path to Progress and Peace	59

Chapter-V. Nature - the Miracle of Creation :

Place of Faith	64
The Natural Constants	66
Evidence of Purpose in Creation	68
Miracle of Nature	70

Appendix	74
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References	79
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INTRODUCTION

The persuasive human mind does not rest until it gets an intelligent answer to all the questions it raises within. Nature is an all-encompassing environment that we see and are part of. By definition it is the universe and its phenomenon. Through the ages the inquisitive mind has sought answer to all the questions of cosmic evolution. In the beginning the earth was flat to our conception, then with exploration it became round, with scientific progress we assigned a spin to it explaining that the rotation takes the sun out of our vision creating night from the day and day from the night. Earth's rotation round the sun is completed once a year and the inclined axis brings the northern hemisphere closer towards the sun while the southern hemisphere remains further away and *vice versa*. This explains the summer and the winter months and the seasonal changes, through the proximity and comparative remoteness of the sun on the earth tilted towards and away from the sun respectively. We now have a good idea about the science of our solar system and the earth. But the never ending quest for knowledge keeps opening up many exciting facts of the depth of the oceans and with many other facts which so far remained concealed, keep revealing themselves to us. Today, after all of our explorations on how the cosmic past evolved, and the very exciting discoveries guiding us to the very mechanism of creation itself, we are still limited to only a rational argument of it awaiting a more detailed experimental evidence. We are looking for other planets amongst the stars, and life on Mars is still a puzzling question. Within our own ocean we have recently discovered a completely new form of life! (*Science*, 23rd. August 1996). The explosion of knowledge coming to us is solving many questions, and with it new questions are coming up, which includes the facts related to our basic existence, its purpose and all the creation, as we now perceive in space and time. We are also trying to figure out why the laws of Nature are what they are, why does the universe consist of what it does, and how did they happen and organise itself to what we have today. The development of life itself and its manifestation, ending up with the human species, which now inhabit the earth, remains a puzzle.

In the past Faith in the Unseen was taken as a conviction that we developed within us. When we could not answer or understand the nature

of creation of the cosmos and ourselves within it, we accepted it as a creation by the Creator. History of mankind establishes that prophets came and conveyed to the human society, messages from the Creator, and with it explained the purpose and guided us for our short existence here on earth. However, the basic nature within ourselves seems to create more questions than we have answers for. The scientific analysis of the facts known to us in the context of cosmic creation, with the human beings as an integral part of it, has been discussed, in the later chapters. The basis of our faith and the scientific understanding as it is coming to us, is explained in the context of religion, and Islam in particular. Religious quotations have been limited to quotations from the holy Quran coming from my own understanding. The English translation by Moulana Abdullah Yusuf Ali was presented to us before the atomic age started, and as such sometimes the words or the expression used, have preceded our own understanding and it came before our scientific perception and discoveries of today's world, projecting a faith in our science and creating a science of Faith. The remarkable fact is very obvious, what we know today was not known to us during the time of our prophet Muhammad (SAW). Studies from texts of other religions can substantiate similar understanding, and the Creator in all His Wisdom presented to us what we can now understand more clearly, with information within the examples, and parables in the religious texts. Only statements in the book of holy Quran sent to us, with His Guidance for us to follow, is mentioned herein.

Scientific facts we accept without any questions, being a product of our direct conception, which comes sometimes from experiments, and sometimes from logical inference of observed facts. Even then what we know as true today, can and does change tomorrow with further investigations, observations and experiments. In spite of these revisions or corrections, our faith in science does not change, simply because all of it comes to us through a direct conception of our logic and observation. When it comes to the question of a Creator and His messages, for our own liberation through the prophets, our perception is sometimes unable to understand and accept it in the same scientific spirit. The spiritual guidance coming from the Creator does not directly manifest itself, but the scientific knowledge coming from the same source is a material manifestation of facts. The controlled guidance and constraint of a society under the political

umbrella exercises an authority of immediate reward and punishment, which makes it easily acceptable. Even there we have our differences, and various principles of democracy, socialism and other way of life that we try to enforce through material means of implementation. The religious Guidance given to us by the Creator, for a code (way) of life, is more ignored than acknowledged.

The correlation between our knowledge of science and the spiritual guidance is for our educated mind to accept or reject. Modality of the system of our education makes it easy for our mind to accept empirical facts and axiomatic truth. The fundamental principles of the concept of zero as absolute nothing or the addition of one to one to produce two are in the realms of axiomatic truth without which all mathematical genius will fail to exist² (**Creation and the Cosmos**-M. Manzur-i-Khuda, Kakoli Prakashoni, Dhaka, 1995). The sequence of creation, which is evident before us, calls for an empirical chain of events, which can be accommodated acknowledging an intelligent guidance coming from a Creator. This accommodation of a factual concept is inherent within religious guidance.

Time is not absolute in its manifestation. Since the moment of creation it has remained a relative truth only to the observer. Einstein's theory of space and time as we understand in the context of dimension of dynamic time itself has been presented for our understanding. Nothing can exist without a dimension of time, for a human being a zero dimension of time or space means that he has not been born yet. Time can and does change relative to the observer, slowing down with gravity and increasing with speed (acceleration). Our own existence in the whole gamut of creation is now revealing itself to us, because we are part of it as an observer. This role of us as observer, is an integral part of the extensive creation, and later discussions and a fine-tuning has unveiled it for our own understanding. Time being only a dimension, the whole of the space-time web of creation is known only to the Creator in its created form. The reality of the creation within matrix of space-time being realised at the same time, with its beginning together with its completion. The all-important factors of time and space with us as the observer in the cosmic scenario have been presented with scientific explanation and religious quotations. Presence of human beings as part of the living animal kingdom has been traced and

additionally the anthropic principle of our three-dimensional (time being the fourth) reviewed³ (**The Edges of Science** - Richard Morris, Prentice Hall Press, New York, 1990). Life as we know today can only exist in regions of space-time, with three dimensions and an integral time scale. The importance of our existence in the context of the known history of our creed has been traced, but we are still striving to find the missing link in the chain of human evolution or his revolutionary appearance. Developments in knowledge of science and our faith in it have resulted in the modern developments. A special importance of social support available for the scientific development during the early Muslim period with the support of religious leaders explains the success of the time. Galileo's statement that the earth rotates round the sun was opposed to the church's belief and his excommunication has only recently been withdrawn. Pope John Paul II declared in 1982 that the church had erred in condemning Galileo.

The contribution of Muslim scientists of the golden era has been discussed, with the socio-religious support it established the foundation of our modern science (Appendix). Changes in our life style and with it the changes in our spiritual concept for the worldly life has been superseded by technology as the definition of civilisation. In the past we understood civilisation as a progress, and it used to be judged on the basis of moral and ethical growth within the society, and now technological developments have become synonymous with the concept of civilisation, leaving behind the moral and ethical consideration as the will of social decision. The change of our goal to the material world and its achievement has brought with it the inevitable changes in religious practices in most of the countries. Indeed religion as a way of life, has in some instances changed its own guidance on the basis of popular social demands. In our pseudo scientific societies, Faith and its practice has been made a religion of convenience changing itself with the so called "modern" developments, more for our worldly benefit than for our spiritual guidance, resulting in the reward and punishment for our life here on earth rather than the "eternal" life, as it was meant to be. The technological benefits of an earthly (worldly) life have become our goal, replacing the religious goal for the "afterlife".

The facts which explains the growth of a whole plant from nothing but air, water and sunlight, initially was accepted as a miracle by my childhood

mind. But later with all the knowledge of scientific facts, it became a scientific miracle within a chain of natural development. I believe that the very complex scientific order which exists behind the growth making the synthesis of thousands of the components possible from thin air with its moisture, nitrogen and carbon dioxide is by a special design and not by mere coincidence. The life sustaining role of water is very well established, not only for its being essential for our body and body fluids (over 90% being water), but also for the energy giving foods developed from it directly or indirectly, from all the oceans and the river resources. The rivers and the oceans are alive with ninety per cent of world's life and we all depend on them. When water freezes the ice floats, because water achieves its maximum density at four degrees Celsius and sinks to the bottom. Further cooling brings it up again and when it freezes at zero degree it forms a floating ice cover over the water. Ice being a poor conductor of heat, it does not allow the water to freeze in the frigid climates. This allows the growth of the major ocean life to survive below the cold waters thus sustaining the life cycle on earth.

The scientific explanation is simple, but its spiritual concept of being a miracle of nature comes to us in good faith. The importance of Faith in sustaining our worldly existence and making our immortal selves, not the body but the souls or spirit enjoying the facility of our body and mind needs no explanation. We have developed our world based on definitions - red is red, and one day is determined by a complete rotation of earth round its axis, are definitions, creating an axiomatic truth. Axiomatic truth - one is one, and that the sun exists because it is visible, are accepted without further proof, being an axiomatic assignment of a conceived truth. Arguments against such truths will remain only arguments and can not nullify the facts.

The material world is for us to use and enjoy while we are here. But the eternal soul must earn its due reward from this short life that we spend here on earth (**The Holy Quran** - Chapter 57, Verse 20). To achieve our eventual success, "*Nirvana*" or a freedom from bondage of the material world, and its righteous use keeping our goal for the Hereafter, will achieve the promised reward from the Creator Who created us. Material wealth may bring comfort of life but the peace of mind can only come from our

spiritual self (of mind and soul). Some of the richest people are known to be the unhappiest, and the simple life of a third world poor peasant can be a happy soul.

Relevant Quranic quotations have been used, to substantiate many scientific explanations. Human history shows that religions have come to us as a way of life, and it has come to us in stages, keeping pace with our developments. They have been assigned various names like Hinduism (evolving in Hind i.e India), Judaism (as brought in by Moses), Christianity (as brought in by Christ) etc., and are so named for our own convenience only. Knowledge of science has come to us from the same source as the spiritual one. Science shows us the way for material understanding and is used by technology for our worldly progress and all religions (Islam states that it achieved its completion about 1400 years) has come to us, the human society, for our peace and happiness in this world and the success of Hereafter. We have to apprehend and follow what is expected of us, and are blessed with proper guidance to enable us to understand the meaning of our existence here on earth. Besides all other creations, our creation as an integral part of the space-time scenario, with our Faith and all the scientific knowledge coming to us, makes an intelligent understanding easily achieved. Our role as an observer in the whole scenario of cosmic evolution is an integral part of the design of creation itself.

The significance of a number as great as 10^{78} , one followed by seventy eight zeros as the total number of matter particle in the universe, or the number as small as 10^{-43} that is one divided by one followed by forty three zeros, the Planck constant less than which nothing can be conceived (being the ultimate indivisible time unit) is now understood by our mathematical calculations and its own logic. An absolute cosmic symmetry in the context of creation signifies that there is nothing, and it is said to break when some actions upset this equilibrium thus creating something. The basic matter particles which used to be atoms, have now been shown to consist of the various groups of *quarks* (cannot exist independently), that form the atoms. An atom is a micro representation of a solar system with sun and the planets floating in the huge void of space. In case of atoms they are the nucleus and the orbiting electrons working within a comparative void, but this is only for our casual understanding. An absolute zero temperature is

represented by minus (below the freezing point of water) two hundred and seventy-three degree Celsius, which is represented by zero degree Kelvin. The present temperature of the void of space has been measured to be 2.73° Kelvin. Some of these facts of cosmic evolution have been explained to enable us to grasp the significance of Space and Time. Human beings and their role in Faith and Science for a meaningful understanding of our worldly existence have been discussed for establishing a possible correlation.

Scientists and the educated people of the Western curriculum have in general tended to deny the presence of God in the scheme of creation, as observed by Carl Sagan who believes that laws of physics alone could explain the birth of the universe leaving "nothing for a Creator to do". Allan Sandage has spent a lifetime analysing the secrets of the star, admits that the scientific community so scorns faith that one feels reluctant to reveal himself as a Believer. Robert John Russell, a physicist turned theologian, believes that science and theology are entering a new era of understanding. John Polkinghorne, a distinguished physicist turned priest observes, "When you realise that the laws of Nature must be incredibly finely tuned to produce the Universe we see, that conspires to plant the idea that the Universe did not just happen, but that there must be a purpose behind it." Charles Townes, a Nobel laureate in physics observes, " Many have a feeling that somehow intelligence must have been involved in the laws of universe." A natural constant Pi, circumference of a circle divided by its diameter is 3.14159..., which also turns up in equations describing subatomic particles, light and many other quantities having no obvious connection to a circle, indicates that our mind, according to Polkingstone points to a very deep fact about the nature of universe. Carl Feit, a cancer biologist, observes that pure thought can penetrate the universe's mysteries, "this seems to be telling us that something about human consciousness is harmonious with the mind of God."⁴ (Science Finds God - Sharon Begley, *Newsweek*, July 20, 1998).

Professor Abdus Salam in his acceptance speech for his Nobel prize, started by saying, "*Ashadu-an la-ilaha illallah, wa ashadu-anna Muhammadan abduhu wa rasuluhu*", which in Arabic means that I bear witness to the fact that there is no god but God, and I further bear witness

that Muhammad is His prophet. I myself had the opportunity to hear him speak before the Chittagong University Senate, wherein he started his lecture with the same statement of Faith as indicated above. He was happy to note that I was a practising Moslem and encouraged me to discharge my duty as Ulema, which according to him meant scientist, and it surprised me. Actually, ulema in common Arabic term is normally used to indicate a religious scholar (theologian). Ulema in literal sense means, one who practices "Ilm", generally meaning knowledge and specifically used for "Science" in Arabic. As is true for most scientists, I myself was very reluctant to publicly acknowledge my Faith, but his encouragement broke the barrier enabling me to pursue religion as the spiritual knowledge, besides the worldly knowledge of science. Mehdi Golshani, a physicist in the Sharif University of Technology in Tehran believes that natural phenomenon are God's sign in the universe, and he quotes the Quran, "Travel through the earth and see how God did originate creation: so will God produce a later creation: for God has power over all things"(Chapter 29, verse 20), studying them (God's sign) being almost a religious obligation. Research itself is according to Golshani an act of worship that reveals more of the wonders of God's creation. Dr. Maurice Bucaille's book, "**The Bible, the Koran and Science**" (American Trust Publication, Indiana, 1978), encouraged me to go into the details of science in the context of religion⁵.

In the text reference for book, has been presented in **bold** letters and journals in *bold Italics*. Instead of surah and ayat, chapter and verse (0:0) has been used for the holy Quran. A trillion (10^{12}) has been used for one thousand billion (10^9), a billion for one thousand million (10^6), 10^{-9} for one billionth, 10^{-6} for millionth and so on.

While discussing the modalities of creation of our universe in scientific terms, the Quranic statements where appropriate has been mentioned. The revealed religions as stated in the Quran, of Judaism, Christianity, Zorastrianism and Islam have common roots and believe in the same Creator. This has also been specifically acknowledged in the last of the four religious texts. Other religious faith, where appropriate may establish the same truth, as seen from the quotation from the Quran. Earlier religions, which came to us through other geographical regions, can in many

instances also substantiate the facts presented. Indeed, prophets came to all the People everywhere on earth, some at the same time. The importance of our role as an observer in the scheme of creation has been shown. The historical role of the contributions of the golden era of science by the Muslim scientists has been mentioned to illustrate the complimentary and supplementary role of science and religion as was practised at that time. At the end mysteries of science and faith which shows us the way to the Creator, has been put up.

Chapter-I. The Scenario of Cosmic Creation

The Universe:

Our daytime experience limits itself to the presence of a powerful sun with its light and heat, obscuring all that is between us and beyond it. The night brings with it the presence of stars and the moon, opening up the door to an infinite expanse of the cosmos itself. Even then our observation is limited to what we can see, either directly or through a telescope. With this limited ability we came up with various theories of creation and the universe itself. The steady state theory, which even Einstein himself believed to be true, required no beginning (and thus no end) of our universe, and it has only recently been replaced by the expanding universe established through the observation of Hubble, which showed the red shift or the Doppler effect of the stars.

The Doppler effect is the result of compression or expansion of wavelengths of various forms of radiation like the sound or the light waves. The sound of the whistle from an approaching train is much shriller than that coming from a train moving away from us. This is the result of compression and expansion respectively of the sound waves by the speed of the train itself. Similarly, light waves coming from a star moving away from us will be elongated to the higher wavelength of light, like red, producing a red shift. On the other hand a star rushing towards us will result in the compression of light producing a blue shift. The daring expansion theory of universe, proposed by Hubble was confirmed through observation of a red shift through the 100 inch telescope mounted at Mount Wilson by Humason (The Red Shift and Magnitudes of Extragalactic Nebulae - M.L.Humason, N. V. Mayell and Allan R. Sandage, *The Astronomical Journal*, Vol.61, 1962; also The Red Shift - *Scientific American*, September 1956)^{6,7}. This theory has now been developed to show that the universe started from a primeval atom or nucleus, which expanded after a "big bang" explosion and is still expanding today. All atoms have a compact nucleus with a huge void of space around. If this space is eliminated then all the atoms of the universe will collapse to very nearly an invisible dot with a hundred million billion tons density (heavier than water). The big bang theory postulates that the super ball of dense matter gave rise to a

temperature in excess of a thousand billion degrees and a massive explosion, giving rise to the beginning of our universe⁸ (**The Creation of the Universe** - George Gamow, The Viking Press, 1952). The search for creation of the cosmic egg is still continuing, but we have been able to come up with some extremely plausible theories, mostly supported by mathematical deductions. In the domain of the beginning itself direct experimental proof will not be possible to create, but indirect proof and mathematical projections are being pursued with good results. This sequence of spontaneous creation of the cosmic black ball and the later big bang is simply stated in the Quran as: "When He decreeth a matter He saith to it: "Be;" and it is."(Chapter 2, verse 117), and the beginning of a spontaneous creation *ex-nihilo* is coming to our knowledge with recent scientific explanations, opening up a better understanding of such verses.

The Early Scenario of Creation:

Our knowledge is being constantly updated by space explorations and the Hubble Telescope has expanded our horizon of visibility. Last few decades have rewarded our ever-increasing human curiosity with a better understanding of our existence in the context of creation, with its extensive support of measurement in a time scale. When creation started at zero time the space was also zero. Both time and space, are interdependent in the context of our existence, and it must have evolved as we conceive it, only after the first creation that produced matter and energy within the confines of a cosmic egg giving rise to the Big Bang, which is followed by later developments in various stages⁹ (God and the Science of Creation - M.Manzoor-i-Khuda, *Journal of Islamic Thought and Scientific Creativity*, Vol. 2, No.3, 1991).

We have now established that in the domain of present day world there are four basic forces, which can explain all the law physics in the universe. All of these forces were unified as a Super Force at the beginning of creation. They are named: i) the *Strong Nuclear Force* and ii) the *Weak Nuclear Force*, acting within the atoms and iii) the *Electromagnetic Force* and iv) the *Gravitation Force*, which act in the domain of all pervasive cosmic space and the universe. The appearance of these fundamental forces of Nature in the scenario of creation can be understood by studying

the question of breaking of symmetry, and the big bang. In the language of science an absolute symmetry will signify, balance in form, size, and position of parts that are on two sides of an axis. An examination of the **C**, **P**, **T** symmetries, wherein **C** denote laws for symmetry of particles and anti-particles (matter and anti-matter particles), **P** denotes symmetry for a left handed spin particle, with its mirror image right handed spin particle (both are particles spinning like tops in opposite directions), and **T** denoting the time-reversal symmetry which will make laws for both the forward and backward motions of Time identical (that is time during the expansion and the reverse of it during contraction of the universe), has given rise to some very interesting observations. Lee and Young in 1956 showed that the *weak nuclear force* does not obey the **P**- symmetry, by aligning radioactive atoms in a magnetic field, whereby particles spinning in one direction were shown to give off more electrons than those spinning in the opposite direction under magnetic polarisation, and Nobel prize followed this discovery. It was also found that the weak force did not obey the **C**-symmetry, that is an universe composed of anti-particles will not behave the same as our universe, but the combined **C**, **P** symmetry was obeyed by the weak forces. Cronin and Finch later on found that even this **C**, **P** symmetry is not obeyed by the **K-meson** particles. Since laws of physics demand that an ultimate symmetry must exist, it follows that the combined **C**, **P**, **T** symmetry must always be obeyed. To make this possible, it follows then that **T**-symmetry will not be obeyed by the **K-meson** particles. This is also proven by the concept of *Entropy*, the universal tendency for order to break down to disorder or chaos. Entropy increases with time, and if at any point our development is reversed, the reverse journey will not be the same, because the entropy will still keep on increasing without a reversal (chaos to order, does not spontaneously happen and is called negative entropy). Under laboratory conditions creation of matter and antimatter is always symmetric. The Big Bang caused more *anti-electrons* to turn into *quarks* than *electrons* into *anti-quarks*, because of breaking of symmetry as described above. Thus after mutual annihilation of *quarks* and *anti-quarks*, a net balance of *quarks*, the ultimate building blocks of matter remained.

According to theoretical calculations, during the first billion billion

billion billionth of a second of creation at a temperature of a billion billion billion degrees, for every thirty billion of *antiprotons* one more protons in excess of that amount was created. Similarly, electrons also outnumbered positrons by one in thirty billion. Even though creation of something from nothing is logically impossible, the scientific explanation was accepted. Even today we are looking for any residual antimatter galactic material beyond our present day observed universe¹⁰ (Cosmic Antimatter - Gregory Tarle and Simon P. Swordy, *Scientific American*, April, 1998). The creation of matter and energy through the small asymmetry, as allowed by Grand Unification Theories (GUTs) in the matter and anti-matter production of early stages (as explained later on) giving rise to a *baryon* (name for all matter particles) non-conservation has resulted in the 1980 physics Nobel prize shared by Val L. Fitch¹¹. (The Quark Structure Matter -Frank Close, *The New Physics*, University of Cambridge, 1989). Recently, some experiments have been set up to establish this CP symmetry violation. BaBar detector when operative will measure **B-mesons** decay (transforming to other particles and/or energy), which is a very good candidate for such experiment. It is produced by very high velocity collision of the negatively charged electron, with its opposite the positively charged positron, within the SLAC (Stanford Linear Accelerator) Asymmetric factory, utilising the storage facilities at CESR (Cornell Electron-Positron Storage Ring) allowing study of about 100 million **B-mesons** per year from 9.0 billion electron volt of electrons (ev, an unit its measurement) and 3.1 giga electron volts (10^{11} ev) of positrons¹² (Accelerator Gets to Explore Cosmic Bias - *Science*, Vol.281, No.5378, 7th.August,1998).

Stated simply, the big bang creation developed itself in micro-stages releasing the fundamental forces (four) and allowed the later development of a matter-dominated universe as explained later. Some of the experimental proof consolidating the theories of initial stages of creation starting from one unified single force and at a point in the space-time scenario, are given above. More proofs are required to experimentally substantiate some of these projections, before we can reach the point of singularity or unity.

Creation ex-Nihilo:

In the holy Quran, besides the order of the Creator, "Be" for the creation (obviously from nothing, i.e ex-*nihilo*), there has been mention of the creation proceeding in certain stages of development. Such references are described later on, but first let us see what we have been able to get through our scientific explorations and the knowledge accumulated therewith so far. This knowledge read with the Quranic revelations may give us a better understanding of the references made out in the holy book for our guidance.

An understanding of big bang after 10^{-43} seconds of creation is now widely accepted. Any happening beyond the Planck time of 10^{-43} sec. (the smallest unit of time) and the Planck dimension of 10^{-33} cm. (the smallest unit of dimension) is incomprehensible in physical terms and the laws of physics cannot probe beyond that. A logical explanation based on scientific arguments of creation of a cosmic egg from time zero to 10^{-43} sec. has been published earlier on, by the author. In the process of creation after the big bang explosion of the cosmic egg created by quantum fluctuation, for every matter particle - the baryon, there are 400 million photons in the universe, and 10^{78} baryons make up the cosmic universe itself. The scientific explanation for an ex- nihilistic creation from absolute nothing, not even space and time, through quantum fluctuation as can be experimentally observed in a vacuum resulting in spontaneous creation of matter and anti-matter particles (through borrowed energy) and its subsequent annihilation (returning the borrowed energy), is well established¹³. (Edward P.Tryon in *Nature*, Vol.246,Dec.14,1973 and Creation of Universe from Nothing - Alexander Villenkin, *Physics Letter*, Vol.117B, Nov.4, 1982). Just the same as one pair appearing as seen in a laboratory experiment, billions or infinite number of such spontaneous creation is equally possible. The quantum fluctuation of particle and anti- particle production has to proceed at speed of light, and at that speed the special relativity considerations forbids any movement of time (anything moving at a speed of light will make time stand still). On the other hand general relativity will bring down the speed with accumulation of mass (at an infinite mass structure time will also stand still). The quantum fluctuation will result in subsequent accumulation of matter, and would eventually create a mass structure approaching infinity

for the cosmic egg. This ultimate scenario will also stop movement of time and bring down the speed of quantum fluctuation approaching zero. In a mathematical projection the speed of quantum fluctuation and the mass formation will remain proportionate during this period, as per the special and general relativity considerations, thus keeping the time factor, and consequently the space factor, stationary at zero, during the whole period of cosmic egg formation. Cosmic space evolved only after creation in the whole, a web of space-time creation¹⁴ (Time and Space - the Building Blocks of Our Existence, M.Manzur-i- Khuda, *Journal of Islamic Thought and Scientific Creativity, Islamabad*, Vol.7, No.3, Sept.1996).

Cosmic egg thus realised can then follow our present understanding of the big bang cosmology, with an initial phase of inflationary expansion to 10^{50} times or beyond, all of it possibly within 10^{-32} second as has been explained in various scientific publications. Big bang theory cannot go back beyond the Planck time 10^{-43} second, and the laws of physics can not conceive the geometry of space-time shorter than this. The creation from a dimensionless point, and a timeless, energyless, massless beginning as explained here, and the big bang explosion following it, allows the understanding of what happened after beginning of time. The whole scenario of creation with time and space appears only after the big bang. Emilliani establishes the appearance of time, space, energy and a superforce only after creation started its manifestation. Immediately after this at a very high temperature (10^{32} or 10^{31} Kelvin stated by Emilliani), gravity is the first force to separate out¹⁵ (**The Scientific Companion** - C.Emilliani, John Wiley and Sons Inc., New York, 1988), still leaving the three other forces to an unified existence.

At this point of creation, after separation of gravity, the "*super force*" then separates into two other forces - the strong nuclear force and an "*electro-weak force*" at a temperature of 10^{28} Kelvin after 10^{-35} seconds of the beginning of creation. At this point we had only three fundamental forces. The *electro-weak force* then gave rise to the two remaining natural forces, the *electromagnetic* and the *weak nuclear forces* only after 30 milli micro seconds to 5 micro seconds (3×10^{-10} to 5×10^{-6} sec.), followed by the stabilisation of *quarks* and *anti-quarks* - the ultimate building blocks of matter and antimatter, at a temperature of 3.6×10^{14} to 2.9×10^{12} Kelvin.

Experimentally, we have now been able to go back to this stage of scenario of creation. Steven Weinberg and Abdus Salam in 1967 succeeded in recasting the mathematical description of electromagnetic and weak nuclear forces, presenting the two in an integrated mathematical fashion. Later on the experimental evidences slowly kept on accumulating and in 1980 they received the Nobel Prize for this. The two unified forces giving the "*Electro Weak Force*" was deduced to have three particles carrying the force (all the forces have designated particles to carry them), called **Vector Bosons** (W^+ , W^- and Z^0) and they had the same spin as *photons* (+1), the massless light particle, and were its massive partners, each weighing 100 Giga electron Volts (10^{11} electron Volts, one electron volt is measured by the acceleration of an electron across a potential i.e. voltage difference of one volt)¹⁶ (Gauge Unification of Fundamental Forces - Abdus Salam, *Nobel Lecture*, The Nobel Foundation, Sweden, 1980). Later in 1983, in an experiment in the very powerful particle accelerator at CERN (Centre for European Nuclear Research), these vector boson particles were discovered at the very high temperature, produced by high speed collision of accelerated particles and anti-particles with each other, travelling at a speed approaching that of light. The unification of the forces envisaged for the next stage of unification giving rise to a super force and gravity will require another thousand-fold increase in the temperature, which is as yet beyond the experimental ability of our cyclotron machines.

Our mathematical projections giving us the insight into the temperature and the time sequences of subsequent developments indicate that protons and neutrons formed when temperature came down to 1.4×10^{12} Kelvin after 6 micro seconds (10^{-6} seconds). The stabilisation of electrons and positrons takes place at 3.9×10^9 Kelvin after 10secs. Nuclear Deuterium, Helium-3 and 4 ions are formed at 9×10^8 Kelvin after 3.8 minutes and around that period nuclear synthesis produced minute quantities of lithium. Electrons are captured at 3000° Kelvin and H, He and molecular hydrogen are formed after 700,000 years to-gather with minuscule amounts of boron, beryllium and helium-3. It takes 2 to 3 billion years of our time scale for the millions of *quasars* to form, the *quasi*-stellar objects are immensely massive but relatively small objects, and the galaxy formations followed. The cosmic radiations slowly came down to the visible and invisible range of our spectrum allowing chemical and biological evolution resulting in the

present day universe. The growth of clouds of gases and the millions of galaxies, each with millions of stars within (and the planets, which formed around them) followed. One of the stars, the Sun resulted in formation of earth, moving around it, the sun being one of the many stars in our milky way galaxy, which happened in the time range of possibly 10 to 15 billion years of our reckoning. At the beginning of creation annihilation of all the trillions and trillions of the matter and antimatter particles leaving behind the residual matter of our present day universe, would have resulted in a tremendous amount of energy in the form of heat. This is expected to be still visible to us, and indeed, the cosmic background temperature is now measured at $2.73^{\circ}\text{Kelvin}$ ¹⁷ (**The Search of Big Bang** - John Gribbin, Heinemaan, London, 1986).

It was still not possible to satisfactorily answer many of the questions including, i) the *Horizon problem* - the universe includes vast regions which could never have been in casual contact (considering the expansion rate), ii) the *Flatnes problem* - the universe as we observe is very nearly at the critical mass-density from an initial start, homogeneous to within an incomprehensible fine tuning of one part in trillion trillion trillion trillion, and iii) the *Clusters of matter formation* like the galaxies could not be satisfactorily explained. Alan H.Guth in 1979 discovered inflation as the key factor in the cosmic evolution, which could satisfactorily explain the problems. For a very short time of about 10^{-32} seconds, when actually gravity acted as a repulsive instead of an attractive force, resulted in nearly a spontaneous expansion of the universe to 10^{50} times or more and was followed by the symmetry breaking at 10^{27} Kelvin temperature¹⁸(*The Inflationary Universe* - Alan Guth and Paul Steinhardt, **The New Physics**, Press Syndicate of University of Cambridge,1989). However, for this to happen an expansion much faster than the speed of light and a variation in the otherwise smooth background temperature is required to be present, and it had been eluding us so far. Expansion of space, which is neither matter nor energy (being a void), can easily happen surpassing the speed of light many times over, without breaking any physical laws of Nature. The recent COBE satellite findings show ripples barely thirty-millionth of a Kelvin, and this variation in the background temperature of space, can now explain the galaxy formation within the denser spaces of cosmos¹⁹(COBE finds the Bumps in the Big Bang - Faye Flamm, **Science**, Vol. 256, May

1st.,1992). It has also now been further confirmed by observation from a balloon placed 30Km. above Texas and New Mexico.

Let us go further into the scientific realm of creation sequences before turning our attention to the Quranic references for the same.

The Earth Scenario:

Creation of our earth materialised only about five billion years ago, but the actual mechanism of this creation is still shrouded in mystery. Explosive speed of the creation of cosmos had to be fine-tuned so as to make it right for a balanced expansion countering the gravitational force of the created matter. Anything, less would have made the cosmos fall back on itself in a "big crunch", thus going back to the primary scenario of creation. And a speed more than what it was, would have made the expansion so rapid as to eliminate the possibility of any galactic formations. Astrophysicists have calculated this delicate balance that was required for the precise evolution of our universe. If the speed of explosion at the outset of the big bang even differed to the extent of one part in a million trillion trillion trillion trillion (10^{60}), this universe would not exist. Its statistical probability is the same as hitting an one inch target placed at the other end of the universe at a distance of twenty billion light years away (one light year is the distance light travels in one year's time at 1,86,000 miles per second).

After about three billion years of the big bang, clouds of matter formed, and started to condense into various mass concentration of the billions of galaxies that we see today. Our Milky Way must have started forming during that time, and the sun being one of its stars, formed much later. It has been postulated that most of the galaxies if not all of them should have central mass concentration carrying a *black hole* (a huge mass concentration in a micro-space). Gravity is the weakest of all the natural forces, but it has an accumulative effect of making everything collapse and even the earth or the sun would have collapsed without their stiffness (as in earth) or the power of pressure from within (as in sun), such a collapse would result in a black hole. The black hole, because of its tremendous gravitaion pull, will result in everything flowing into it, to an apparent oblivion of spaceless concentration of mass, which will be so powerful in

its gravitational pull that even light (photon particles) will not escape from it, thus making it an invisible point in the universe or the galaxy. During the early galactic formations, some of them did collapse and exploded again to continue the sequence. Recently, a black hole has been reported even within our own Milky Way. The detection of these massive celestial bodies are very difficult (for lack of any visible radiation) and has to be done through precise measurement of the bending due to its gravitation pull, that it causes to the light coming from other stars near it. A direct evidence of a picture showing a black hole, has now been collected by the Hubble Telescope in space at the centre of galaxy NGC 4261, with a mass of 500 times that of our sun²⁰ (Hubbles Eye on the Universe - William R.Newcott, *National Geographic*, Vol.191, No.4, April 1997). The gradual condensation of matter with the various energy balancing its own gravitational pull allows the creation of the celestial bodies. The stars are the central bodies around which the planets formed much later. This could have been caused by the pull of another celestial body's passing influence, or could have been caused by its own centrifugal force of rotation throwing out a part of itself. Similarly, the moons also formed around the planets themselves, being a repeat of a similar process.

Once the planet formation is accomplished, it starts its own sequence of development. In case of earth this sequence which started five billion years ago produced the only planet in our solar system which might have followed demise of life elsewhere (e.g. Mars) and so far has the only presence of life as we know today. Statistically, however similar conditions must have existed in other planets and galactic systems, to cause life formation. As yet definite knowledge of such a development is lacking, even though we now have some possible indication of elementary life forms in other parts of the solar system and possibly the universe. In the sequence of geological development in our planet, the sea was formed with landmasses forming within it about three to four and a half billion years ago in the *Archeozoic* era. The highly developed intelligent species of live animals, culminating with the human species, which of them, also have the faculty of consciousness, is known only to exist here on earth. These understanding are explained below in the of the Qranic guidance.

The Quranic Revelations:

The whole scenario of creation in the light of the Quran, based on our present day scientific knowledge, can guide us to a reasonable understanding, of the meaning of some leading references and statements contained in the Quran, "Say: Is it ye deny Him Who created the earth in two Days (meaning periods)? And do ye join equals with Him? He is the Lord of (all) the Worlds. He set on the (earth), mountains standing firm, high above it, and bestowed blessings on the earth, and measured therein all things to give them nourishment in due proportion, in four Days (periods), in accordance with (the needs of) those who seek (sustenance). Moreover He comprehended in His design the sky, and it had been (as) smoke: He said to it and to the earth: Come ye together, willingly or unwillingly. They said: We do come (together), in willing obedience. So He completed them as seven firmaments in two Days and He assigned to each heaven its duty and command. And We adorned the lower heaven with lights, and (provided it) with guard. Such is the Decree of (Him) the Exalted in Might, Full of knowledge." (chapter 41, verse 9 to 21), and in another chapter it is stated, "Your Guardian-Lord is God, Who created the heavens and the earth in six Days, and is firmly established on the throne (of authority): He draweth the Night as a veil o'er the Day, each seeking the other in rapid succession: He created the sun, the moon, and the stars, (all) governed by laws under His command." (Chapter 7, verse 54). And again, "The angels and the spirit ascend unto Him in a Day the measure whereof is (as) fifty thousand years" (Chapter 70, verse 4) and "He rules (all) affairs from the heavens to the earth: in the end will (all affairs) go up to Him, in a (single) Day (or Period) the space whereof will be (as) a thousand years of your reckoning." (Chapter 32, verse 5). The mention of various expanse of time periods (days) can be seen as separate epochs or periods when such references are made in the various chapters and can be understood in the context of its mention. The exact significance of them may also be meaningful when analysed from the viewpoint of an observer.

Time moves differently for an observer on earth and on moon, because gravity makes it slower on earth than on moon (one-sixth the earth's gravity). Similarly, space ship's speed of acceleration slows it down. These relativity considerations taken together with our present day measurement

of time will make the time factor different for observers at different points of creation. This has been discussed in a little more detail later on. At speed of light travel will be possible within the twinkling of eye, covering the whole of the universe! These factors indicate that the mention of days or years may actually refer to time periods, the measure of which may become clear later on. The use of plurality "worlds" in the above context, can now be understood with the discovery of the many planets - some expected to be earthlike, around other sunlike stars, about twelve to date and this number is increasing²¹ (Protostars and Planets - Sara S.Russell and Alan P.Boss, *Science*, Vol.281, 14th.August,1998; Planets discovered around other Sunlike Stars - *Science*, Vol.273, 26th.July, 1996).

The creation of earth in two days may signify, i) the early stage of the creation followed by the big bang and ii) initiation of the energy domain, followed by galactic evolution and ending with present day earth. An earlier publication (**Creation and the Cosmos**, Ref.No.2) had tried to identify these two stages as that of the Cosmos and the four stages that of an earth scenario. The four stages in that case may well be within the purview of the second stage of cosmic evolution. The clear mention of "bestowed blessings on the earth" and "measured therein all things to give them nourishment in due proportion" read together with the Command of bringing "smoke" (the early stages of creation was gaseous) and "earth" together thus completing seven firmaments, makes the assignment of four periods an earth period : i) Formation of earth's crust and consolidation of clouds of gas to a molten mass (about 1.25 billion years), ii) Azoic time of Geological era during which rocks formed (about 1.25 billion years), iii) The oldest life forms appear for which oxygen was a poison (about 1.25 billion years), and iv) The Great Biological Revolution with formation of atmospheric oxygen, ending up with ourselves (last 1.25 billion years).

Besides other explanations, a mathematical projection of the seven heavens has been explained as: i) the solar system, ii) the Milky Way, and the limit of observable universe as the third, the others being further out in the space not visible to us²². (Discrete Orders of Magnitude of Various Types of Natural Phenomenon -M.M.Qurashi, *Pakistan Journal of Science*, Vol.22, 1970). The six eras may indicate the six stages of evolution: i) *GUT era* - from Planck time (10^{-43} sec.) to the first separation

of Force (upto 10^{-35} sec.), ii) *Era of Forces* - Separation of the four fundamental Forces (upto 10^{-10} sec.), iii) *Era of Quarks* - particles form by freezing quarks (ending in about one micro second), iv) *Era of Particles* - nuclei form (upto about 3minutes), v) *Era of Plasma* - atoms form and the universe becomes transparent (3 minutes to 50,000 years), and vi) *Era of Synthesis* - all the matter including life formed (upto present time).

The reference to the various timeperiods in the Quran were in the context of making us understand, and the helpful Guidance and the knowledge of the facts that we are acquiring now, gives us a more comprehensive understanding. Crowning of our scientific efforts with success, only makes it easier for us to realise the significance and meaning of the verses in greater (material) detail. Future accumulation of knowledge may make the significance more elaborate.

Future Developments:

The expanding universe includes all the creations from the level of atoms to the macro level of our galaxy and beyond. The development life as in earth, particularly the intelligent life forms like us the human being, may be a unique creation to utilise us as the observer, who can understand and realise the Creation with Faith in the Unseen. We may still find other life forms elsewhere in the universe. The universe as we see them today is expanding, but the mass of the matter within it counteracts it by its gravitational pull. If we have enough matter within it to counteract the force of expansion, then it will eventually slow down and fall back on itself going back to the black ball of creation, with a big crunch. On the other hand if the mass within the universe is less than what is required to stop the expansion, then the universe will keep on expanding and eventually, after all the driving forces within the celestial bodies gets worn out, it will slowly spread out to a dark expanse of oblivion. A critical balance between the two is not very likely, even though the present state of the universe as we know today, points to something not far removed from it. The mass concentration required for the eventual slow down of the expansion towards a collapse of a big crunch is calculated to be one matter particle per cubic centimetre of space (5×10^{-30} gms. per cubic centimetre)²³ (**Mysteries of the Universe** - Franklyn M.Branley, E.P.Dutton, New York, 1984). The big crunch if and

when it comes is expected to be followed by another big bang creating an oscillating universe going back and forth between big bang and big crunch. In the language of holy Quran, "The Day that We roll up the heaven, like a scroll rolled up for books (completed), even as We produced the first creation, so shall We produce a new one: a promise We have undertaken: truly shall We fulfil it." (Chapter 21, verse 104) and similar statements have been repeated elsewhere (Chapters 10, 27, 29, 30, 32, verses 4, 64, 19-20, 11-27 and 10 respectively).

Presently, all the mass that we can see and which have been accounted for is not even ten per cent of what is required for the big crunch. Actually, it has been proposed that only one third of the mass of the Universe comes from the conventional matter (including dark matter), and the rest two thirds belongs to "*quintessence*" (reminiscent of "*ether*" of earlier times, explained to fill space) a bizarre form of energy possibly inherent in empty space²⁴ (The Flip Side of the Universe - George Musser, *Scientific American*, September, 1998). But indeed, every day we are discovering many of the dark matters with some of the missing mass, discovery of the massive black holes being one of them. Other dark matters for which our search is going on includes: i) *Quark Nuggets* (10^{15} g., evolving near about one microsecond after creation), ii) *Monopoles* (10^{16} GeV, time of origin: 10^{-34} sec.), iii) *Kaluza-Klein Particles* (10^{18-19} GeV, originating at the planck time 10^{-43} sec.), iv) *Invisible Axions* (10^{-5} eV, at 10^{-30} sec.), and v) *The Neutrinos*.

Mass of the neutrinos are presently not precisely known but is envisaged to be very small, originating about one second after the big bang. The electron-, muon- and tau- neutrinos as per standard models were predicted to weigh nothing. However, some recent discoveries in the giant Super Kamiokande detector in Japan, seem to confirm the Harvard University physicist Sanjib Mishra's observation that they carry weight. This weight has been measured possibly to be in the region of 0.1 to 0.01 eV (the electron itself, considered very nearly weightless weigh $500,000\text{eV}$)²⁵ (Neutrinos Throw their Weight Around - *Science*, Vol.281, No.5383, September 11, 1998; and A Massive Discovery - W.Wayt Gibbs, *Scientific American*, August,1998). Of these the primordial black holes (more than 10^{15} gm., origin time before 10^{12} sec. Of creation) and the

existence of the vast ocean of neutrinos, are well known, but their exact number and consequently, the total weight is unknown²⁶ (Overview of Particle Physics - Abdus Salam, **The New Physics**, University of Cambridge, Cambridge, 1989). It is now proposed that every one of the galaxies or at least most of them have a black hole at the centre and the galaxy within which we are living ourselves, is only now showing some evidence of the presence of a black hole.

A recent (1995) unambiguous discovery establishes the presence of Brown Dwarfs in the expanding space of the universe. This and others like it can answer some of the questions for a missing mass. They are stars less than ten percent the mass of our sun but substantially bigger than our largest planet. This is an insufficient mass to maintain nuclear fusion in their core, thus resulting in a temperature of about 15000 Kelvin. This lack of luminosity in the brown star makes it very difficult to detect. It has now been confirmed through x-ray detecting satellites. This now joins as a candidate to account for the missing mass of the universe, which will allow it to collapse again²⁷ (The Latest Spin on Brown Dwarfs; A Gray Day on a Brown Dwarf; and Rosat X-ray Detection of a Young Brown Dwarf in the Chamaeleon I Dark Cloud - Ralph Neuhauser and Fernando Comeron, *Science*, Vol. 282, No.5386, 2nd. October,1998).

The holy Quran does not tell us much more than what is mentioned here regarding our future. But scientists appear to agree that eventually, we will find the missing mass required to cause the "big crunch" and subsequently another big bang of creation with possibly different (or even similar) sequence of developments. This remains in the future domain of our understanding, but new facts are constantly coming up with additional masses. The mention of destruction of earth and/or the Judgement Day scenarios as referred to and mentioned in many places of the Quran may actually be different from the one mentioned herein regarding the end of the cosmic creation as we know it today.

Chapter-II. Time and Space - the Building Blocks of Our Existence

Evolution and the Earth:

Our earth is only about five billion years old at our present day reckoning and the chronology of its geological development leading to the formation of *Eobacterium* organism dates back about three billion years. Blue-green micro-flora living in depths of oceans shielded from ultra-violet radiation and oxygen, both poisons to them appeared two billion years ago. The self-nourishing organism tolerating oxygen appeared with a great biological revolution about one billion years ago. Fossilized skeleton indicates that, multicellular soft-bodied organism appeared 600 million years ago. Oldest humanoid species, *Ramapithecus* of India, came about two million years back (some South African findings also dates back to similar period), which followed the *Metazoan* animal *Spriggina* of Australia and the land animal *Cooksonia* of Britain. More recent studies of some fossil findings now indicate, that they might have originated in South Africa. This was followed by the appearance of the present species, and the present generations of human beings the *Homo Sapiens Sapiens* came into existence during the New Stone Age, only about 25 to 35 thousand years ago²⁸ (The Biosphere - G. Evelyn Hutchinson, *Scientific American*, September, 1970). What we know about ourselves today is based on the written history and the archeological excavations through which we open up the developments of our social and scientific past. This knowledge is limited and gives us some information for only the last ten thousand years.

Agricultural practices were initiated nearly ten thousand years back, and the invention of alphabets dates back six thousand years. Use of metals quickly followed with copper and bronze about seven thousand years ago. The invention of wheels revolutionized our developments five thousand years ago, with the atomic age ushering in our modern existence only a few decades ago.

Evolution of Life:

In the early stages of synthesis in evolutionary chain of events, after creation of atoms and molecules, external energy sources were utilized in formation of simple organic molecules like the amino-acids from carbon,

hydrogen, nitrogen and oxygen, and in a few cases sulfur was also incorporated. All organisms that we find today, use a limited amount of phosphorous, sodium, potassium, calcium, magnesium, iron, manganese, cobalt, copper, zinc, boron, aluminum, vanadium, selenium, chromium, molybdenum, silicon, strontium, barium, bromine, iodine and possibly, chlorine and nickel. The next stage of polymeric chains appear to have formed due to incorporation of some intelligence of a life force which could order formation of protein molecules and evolution of mono-cellular and later on viral or bacterial micro-organism followed. Both the animal and vegetative form of life had their initial creation in the water. Living biological materials like plants, marine life, animals, insects and other organisms that we see today, depend on sunlight, water and air for their sustenance. But the first cellular microorganism that was born from the primordial soup on earth lived under the ocean away from ultra-violet light of sunlight and oxygen of air, which were poison for them.

In 1952 a laboratory experiment with methane, nitrogen, hydrogen and water, through which a high voltage electric current was discharged, resulted in the formation of a rich broth containing amino acids the building blocks of life sustaining molecules. This was thought to be the first stage of a biological revolution on earth. Recent study indicates that the early atmosphere here on earth consisted mainly of carbon dioxide and nitrogen. So far this has not produced any appreciable amounts of organic molecules under laboratory conditions. A solution to this problem has been suggested indicating that life came to earth through the bombardments of asteroids, which contained the life sustaining molecules or may even had some of the early micro life itself, which preceded the bacteria here on earth. Some have even suggested that the whole wealth of water here on earth came from the asteroids, many of which consist mainly of ice. Formation of protein molecules was followed by the complex RNA (Ribonucleic acid), serving the function of DNA (Deoxy-ribonucleic acid) as well, later on giving rise to the actual life containing DNA, the architects of life's building block.

The first biological revolution that took place with the appearance of autotrophic (self nourishing) respiratory organism tolerating oxygen, and it appeared only about a billion years ago. The change over to the present group of living beings of plant and animal origin is a fundamental

revolution in life form. In the later case both sunlight and oxygen has become essential for our life sustenance. The multiple symbiosis between a variety of prokaryotic cells to produce eucaryotic cells came with the advent of this biological revolution²⁹ (**Origin of Eucaryotic Cells: Evidence and Research Implications for a Theory of the Origin and Evolution of Microbial, Plant and Animal Cells of the Precambrian Earth** - L.Margulis, Yale University Press).

The first form of life in the water of oceans and the later transformations, created the RNA followed by the DNA. All the *eucaryotic* cells are believed to carry the descendants of *Precambrian* bacteria (of nearly 2.5 billion years ago), within their body cells, and this includes the human beings. They are the building force of living being and were the first to come in the chain of transformation from non-life to life of present generation of creatures through a process of evolution and revolution. DNA itself (with the help of RNA) in its memory has all the information needed for the development of a living organism or living being from its inception to its death with all the genetic information stored with it. Our understanding of life cycle has now revealed the important role being played by adenosine diphosphate (ADP), nicotinamide adenine dinucleotide phosphate (NADP). These together with adenosine triphosphate (ATP) and the reduced form of NADP (NADPH) help in the transfer of solar energy for fixing carbon dioxide from air to create the all important carbon complexes in every living matter. The eucaryotic cells, coming into existence after the *Precambrian* bacteria, are the surviving remnant of the oxygen breathing bacteria that invaded them³⁰ (*The Rise of Life on Earth* - Richard Monastersky, *National Geographic*, Vol.193, No.3, March 1998).

Chlorophyll forms an energized complex with hydrogen of water molecule and releases its oxygen, and the complex (*chloroplast*) in combination with carbon dioxide reacts in the presence of light (photosynthesis) to produce the carbohydrates in plants. The photosynthetic ability comes from the former *cyanobacteria*, and this process helps with replenishing oxygen in the atmosphere, by removing carbon dioxide released by non-vegetarian life form, including human beings, while breathing in air. The water hyacinth or the green algae *Chlorella* and the red, or the multicolored sea algae grows and multiplies in water, accounting

for nearly 90 per cent of world's vegetative growth. Photosynthetic process also fixes nitrogen in plants to produce various amino acids and proteins. Animals including marine animals convert plant resources and algae to protein, fats and oils. These organic products when burnt in air takes up oxygen and gives away carbon dioxide through the process of combustion releasing energy in the form of heat. Through bio-conversion in our body, with the help of tiny power plants, called *mitochondria* in our body cells, the oxygen of air and sugar is similarly burnt up producing energy (including heat) and releasing carbon dioxide and water. The ocean with its huge reserve of phyto-planktons, fishes and whales, all remain the biggest chemical factories on earth constantly producing more than ninety per cent of the live resources. We are now looking for water and oxygen, a component of water, in other planets to substantiate life forms in other parts of the universe. The recent discovery of fossilized micro-organism inside Martian rock (brought to earth as meteorite) found embedded in our polar ice seems to confirm this³¹ (Search for Past Life on Mars: Possible Relic Biogenic Activity in Martian Meteorite ALH84001 - David S.MacKay et.al., *Science*, Vol.273, 16th.August, 1996; also *Science*, 9th.August,1996 and *Science News*, Vol.150, 10th.August, 1996).

These scientific observation of facts, show the vital role of water, in which, through which and by which, life was created and is now sustained. In the language of the Quran: "He it is Who created the heavens and the earth in six Days - and His Throne was over the waters - that He might try you, which of you is best in conduct".(Chapter 11, verse 7), and furthermore, "Do not the Unbelievers see that the heavens and the earth were joined together (as one unit of creation), before We clove them asunder? We made from water every living thing". (Chapter 21, verse 30). "And God has created every animal from water: of them there are some that creep on their bellies; some that walk on two legs; and some that walk on four."(Chapter 24, verse 45). In case of creation of man the Quran goes on to say, "It is He Who has created man from water: then has He established relationships of lineage and marriage: for thy Lord has power (over all things)."(Chapter 25, verse 54); "He it is Who created you from clay, and then decreed a stated term (for you). And there is in His presence another determined term; yet ye doubt within yourselves!"(Chapter 6, verse 2), and "We created man from sounding clay, from mud molded into shape" also

"When I have fashioned him (in due proportion) and breathed into him of My spirit, fall ye down in obeisance unto him"(Chapter 15, verse 26 and 29).

Creation of man in the society of animals brings in a unique form of superiority over others (as per scientific theory we all came from creations in the water), it includes the intricate formulation of our body (over ninety per cent is water) with organic molecules and the inorganic matter (clay) in the bones (calcium), brains (phosphorous) and blood (iron). These facts seem to be in good agreement with whatever is stated for our spiritual guidance. Human body is composed of not only the material elements but also a non-stuff, which gives us the gift of life. The mind with its intelligence and soul (spirit) uses the body only as a temporary abode.

The matter in the body itself, when broken down to its atoms and molecules consist of 99.9999 per cent of empty space, as disclosed to us through quantum physics and the rest of space are filled with sub-atomic particles moving with all their vibrating energy, ripe with bundles of information making our body function throbbing with its life³² (**Ageless Body, Timeless Mind** - Deepak Copra M.D., Harmony Books, New York, 1993). The nerve bundles get their directions from the brain for all their activity, through neuron impulses (which are electrical in nature), for all their walking, smelling, breathing, seeing or any other physical functions. The messages received by the brain are analyzed with a speed still unthinkable in the domain of the fastest computer and it manifests itself as vision, smell, pain, passion, anger or love. The brain also acts as storage place for all the memory beyond the capacity of any chips developed so far. Recent discovery of gene chips have made a beginning into the realization of a bio-chip computer through introduction of a million probes on a single chip³³ (New Chip Off the Old Block -W.Wayt Gibbs, *Scientific American*, September, 1996)

Sir Fred Hoyle in his presentation before the Royal Institute at London (1982), stated that to achieve evolution of human species as per Darwin's concept it will take 2,00,000 chains of amino-acids to form and re-arrange themselves in a fashion which will be like throwing five millions consecutive sixes on a dice. He stated that he could think of no other explanation beyond planting of life on earth after being spawned for millions of years elsewhere in the universe. The Quran says,"Behold, thy Lord said to the angels: I will create a vicegerent on earth," and then, "We

said: O Adam! Dwell thou and thy wife in the garden and eat the bountiful things therein as (where and when) ye will but approach not this tree, or ye run into harm and transgression. Then did Satan make them slip from the (garden), and get them out of the state (of felicity) in which they had been. We said: Get ye down, all (ye people), with enmity between yourselves. On earth will be your dwelling place and your means of livelihood for a time", "We said: Get ye down all from here; and if, as is sure, there comes to you guidance from Me, Whosoever follows My guidance on them shall be no fear, nor shall they grieve."(Chapter 2, verses 30,35,36,38 see also 30:54). Darwin's theory of evolution suggests that all evolution has taken place through a natural selection, which obviously requires an intelligent Guidance. Scientifically speaking, even a degree of fine selection can not happen by itself and its subsequent deliverance through a species not related to what follows comes through the Creator's design. A revolutionary appearance of man from elsewhere could equally be envisaged as stated by Sir Fred Hoyle from outside the earthly bounds, having been created and nurtured elsewhere before appearance here on earth. Thus an evolutionary or a revolutionary appearance of human species has to come through an intelligent and miraculous Guidance and an exact understanding awaits our future understanding.

The first human like species the *Hominids* are said to have evolved four million years ago. The *Homo erectus*, the ones who could stand up (and walk) came three million years ago, followed by the early *Homo Sapiens* who are said to be anatomically similar to us, came about two million years back. The stone age *Homo Sapiens Neanderthals*, now believed to have come to South Africa about one million years ago. This has been established on the basis of fossilized footprints of a female of the species who had the same type of Mitochondrial DNA as all of our species. Scientifically, it is now known that only one type of (gene) DNA is passed through only the female of our species, and that all the present generation of human beings of all ethnic backgrounds have this in common. Very little is known about what happened in between 60,000 and 20,000 years in the past. The species *Homo Sapiens Sapiens*, the present day human beings with our thinking ability came only during the new stone age, 25,000 to 35,000 years ago³⁴ (The Dawn of Humans - Rick Gore, *National Geographic*, Vol.192, No.3, September 1997).

The most recent discovery of some heat loving (thermo-philic) micro-

organisms (bacteria) which lives deep near the ocean floor on erupting volcanic crevasses and its gases; thrives at temperature of 48-94⁰ degree Celsius and is nurtured by carbon dioxide, nitrogen and hydrogen, producing methane. This belongs to a group of new life form very different from the plants, animals or human genetic structure³⁵ (Life's Last Domain - Virginia Morell, *Science*, Vol.273, 23rd.August 1996). Even more recently, In the extremely acidic waters of Rio Tinto in Spain we have found an abundance of some unexpected organisms thriving in the most inhospitable media which was supposed to kill any known life form so far. Some of these algae and fungi color the water red. The vitriolic (highly acidic) nature of the media in which some 1300 species have been discovered. These findings of previously thought impossible life forms, might very well signify what the Martian life forms if any, would have had to face for their evolution if and when it happened³⁶ (River of Vitriol - *Scientific American*, September,1998). New discoveries such as this is unique in its revelation of Creator's creation, and with such chain of knowledge given to us, even today we may be able to perceive the group of living beings described in the Quran, "And the Jinn race, We had created before, from the fire of a scorching wind." (Chapter 15,verse 27); possibly, fire here refers to a form of energy as opposed to clay and water used for human composition. Jinns are stated to share the earth with us and follow His guidance similar to that of the human race, "Behold, We turned towards thee a company of Jinns (quietly) listening to the Qur'an: when they stood in presence thereof, they said, "Listen in silence!" When the reading was finished, they returned to their people, to warn (them of their sins). They said, "O our people! We have heard a Book revealed after Moses, confirming what came before it: it guides (men) to the Truth and to a Straight Path."(Chapter 46, verses 29,30). Angels on the other hand are possibly light (which has a mind of its, choosing to be a particle of photon or a wave) with intelligence mentioned in the Quran, "Praise be to God, Who created (out of nothing) the heavens and the earth, Who made the angels messengers : He adds to creation as He pleases: for God has power over all things."(Chapter 35,verse1). Light form can travel spontaneously as explained earlier on, and at speed of light, time is immobile.

Human Body and Mind:

The human body lives through the energy it derives by burning sugars (carbohydrates) primarily, and it is supported by fats and oils, and protein molecules - the vitamins and minerals supplement, tone up many other body factors. The energy required for various bodily functions are transported to the numerous cells of the body in the form of glucose, including the heart, kidney or brain cells. The utilization of this energy source is performed through the process of metabolism, which is an action dictated by special intelligence. The pumping of heart is through a rhythmic muscle contraction, elimination of excess sodium and other impurities through dialysis is performed by the kidney, and the electrical impulses going in with information (of sight, touch and smell) and coming back to the nerve centers with command from the brain, making our limbs move spontaneously, are all acts of intelligence. The DNA gives the encoded guidance and its twin the RNA translates them into action through an element of intelligent performance imparted to the thousands of enzymes to make proteins and all the body functions. Every cell of the body (98%) is replaced in the course of a year, skeleton in three months, liver in six weeks, body skin in the course of a month and stomach lining every five days in an active human body - the process slowing down with age. We are not the person as we were yesterday in terms of our physical body, the age of the material body is a relative factor, in terms of our body parts our age can be counted in days, weeks, months or years as the case may be. But if we go to the atomic level it can be reckoned to be as old as the universe itself, all the atoms and molecules were formed from the quarks - having been created in the beginning of creation, supplemented and complemented within our material body. The commonly stated age in terms of years is solely dependent on the observer.

Our body and for that matter the whole of the universe is composed of the ultimate building blocks of nature - *quarks* and *leptons*, which occupy very little space, and the whole of universe comes down to the apparently invisible cosmic egg. Thus our body is primarily a void, in which the quark particles are bonded into atoms (and molecules) by the strong nuclear force, through which intelligent messages are constantly being transmitted by bio-electric impulses, enabling us to perform all the functions as we do. Reality

of our perception is due to our sight and touch, with our reassuring three-dimensional existence (the fourth dimension time, is beside it) conception; and our sight, hearing, touch, taste and smell reinforces this.

Under Einstein's geometry of time and space the whole of the universe turns out to be energy strings vibrating and wielding through void. Neutrino particles are high energy particles with little or no mass, and billions of them pass through the earth every second of night and day. Because they pass through matter without any encounter within or without, we are nearly invisible to them. Neutrinos pass through all the atoms and molecules of our body without any resistance through the void therein. We are visible only to an observer and our presence is essential for a material manifestation of what we see. Bats do not see us but they guide themselves though reflected sound waves from objects, instead of light. The Quran in its guidance says, "When I have fashioned him of My spirit, fall ye down in obeisance unto him." (Chapter 15, verse 29) and then, "They ask thee concerning the Spirit (of inspiration). Say: The Spirit (cometh) by command of my Lord: of knowledge it is only a little that is communicated to you (O men!)." (Chapter 17, verse 85). Human intelligence with our life force (spirit), makes it possible for all our senses to play their vital roles. And this includes the inseparably important role for the human beings as an observer - bestowing upon us the unique and outstanding role in the interest of whole of the cosmic creation..

The concept of Spirit - *Prana*, a bio-force flowing through the body and its presence in all physical and mental functions is also seen in the Ayurvedic and Hindu texts. It is described as a life force or life energy, which in Chinese equivalent is probably described as *Chi*. The Spirit or *RooH* as it is called in Arabic, is our life force and it can not die. Magnetism, electricity, light or any other physical energy does not occupy any space and we cannot assign any spatial configuration to any energy. Soul, which guides our mind or the self within us, possibly is a bio-energy (an energy form of biological nature), and thus cannot be assigned any spatial configuration. The rewards and punishment will come to us on the Day of Judgement for our eternal life, "The Day that the Spirit and the angels will stand forth in ranks, none shall speak except any who is permitted by (God) Most Gracious, and He will say what is right. That Day will be the sure

Reality: Therefore, whoso will, let him take a (straight) return to his Lord! Verily, We have warned you of a penalty near, the Day when man will see (the deeds) which his hands have sent forth, and the Unbeliever will say, Woe unto me! Would that I were (mere) dust!" (Chapter 78, verses 38-40). Obviously, the Reality of our eternal existence comes from the Day of Judgment, with our rewards and punishment, the present world thus acts only as an illusion of a passing phase. When we conceive or perceive anything it is our selves that is our spirit, which realizes it and it is only manifested through the body and mind.

Time and space are relative factors without an absolute measure, being what we as an observer assign to it for our own realization. As per Einstein's theory of relativity time can and does change, only the speed of light remains absolute. Consequently, a person traveling in a space ship at high speed will gain time (time having been slowed down at high speed), and on return to earth will find his twin brother to have aged much more than himself. On the other hand gravity also slows down time; and someone spending a length of time on moon will age more than his twin, as he will find on his return to earth (at one-sixth earth gravity lunar time will be faster). These changes of time factor can actually be calculated and measured experimentally. Thus our existence in a time-space continuum is an illusion that is real only to or for an observer - that is our Spirit.

Time Modulation:

The three dimensions of objects are easily perceived by us through our senses and in terms of our day to day existence play a very important role. All living animals or creatures and to be more general, all subjects of creation by Creator are three dimensional (four dimensional including time; and more dimensions are only in the realm of mathematical projections), two dimensional projections are strictly speaking true only in mathematical terms. A sheet of paper also has a thickness, if we make its thickness zero it will cease to exist, even atoms exist in three dimensions. Theoretically, living beings in two dimensions cannot exist, all our body functions including eating by mouth followed by digestion and ending with excretion, or the circulation of blood through our arteries and veins feeding oxygen to various body cells cannot exist without three dimensions. If we go

somewhat deeper and change our casual examination to a more analytical mode, we will find that every object also have a fourth dimension - the dimension of time, without which nothing can exist. The whole of our material creations as we see them started their existence since their creation, and if this dimension of existence is made zero, they will not exist. As had been explained all living beings actually builds body cells which replaces their own equivalent in the body and the whole human body takes about a year to be replaced by a new body. Thus the infant body grows to a young person and eventually gets transformed to an old person, finally returning the body to the grave to return where it came from - the basic 10^{78} baryons of creation, but our soul or spirit which used the facilities of the body is indestructible, being a form of energy. The fourth dimension - the time, because of our difficulty in directly perceiving it as a dimension through our sensory perceptions, becomes difficult to accept it as a dimension, even though we are using it everyday and without it we can not truly describe or define anything. Time as a dimension can only be conceived as opposed to perceiving the other dimensional objects. We measure time only in a linear scale, the flow of time having no width, breadth or depth of its own. The historical monuments, the Pyramids and the Tajmahal or the individual person will become meaningless without the assignment of a dimension of time to them. We measure this in terms of our own arbitrary convenience. The year used to be measured in terms of twelve lunar months and then subsequently as per later developments in terms of a solar year, which is about ten days more than the lunar year. Our spirit or soul can perceive our age from birth to death; in terms of body we get replaced every year, and in terms of skeleton in three months and in terms of body skin in a month! Snakes renew their skin every year, which is visible to us, but our aging process, except for the visible changes in our appearance does not show itself. Our ourselves as an observer play an integral role in it. Dr. Dipak Chopra describes aging as an illusion, and Sufi poet Rumi describes it as, "You are the unconditioned spirit trapped in conditions, the sun in eclipse." The common proverb, "you are as old as you think you are," is thus a valid spiritual concept.

Length, breadth and height are static in their manifestation but time is dynamic in our conception, having a unidirectional flow of its own. We visualize that this whole universe, began expanding from a big bang and

will eventually stop expanding being a captive of its own gravity of matters (which has to obey a critical mass, yet to be discovered or found), and will collapse on itself ending with a "big crunch" to the cosmic egg of creation, possibly re-emerging with a big bang. Thus it may keep up an oscillating expansion and contraction. The time reversal in such a case will not make the old people go back to their infancy and back to their mother's womb, because entropy will keep on increasing. Entropy is the tendency for order to break down to disorder and is a one way arrow - the time reversal in a contracting universe will most likely create a completely different scenario from our present day world. The next big bang can be made to choose its own design and its own natural constants.

In the language of Quran: "(In Falsehood will they be) until, when death comes to one of them, he says: 'O my Lord! send me back (to life)'- In order that I may work righteousness in the things I neglected.' - 'By no means! it is but a word he says,' before them and on no soul doth God place a burden greater than it can bear. It gets every good that it earns, and it suffers every ill that it earns. (Pray): Our Lord! Condemn us not if we forget or fall into error; Our Lord! Lay not on us a burden like that which Thou didst lay on those before us; Our Lord! lay not on us a burden greater than we have strength to bear. Blot out our sins, and grant us forgiveness. Have mercy on us. Thou art Protector; help us against those who stand against faith." (Chapter 2, verse 286). "To Him will be your return - of all of you. The promise of God is true and sure. It is He Who beginneth the process of Creation, and repeateth it, that He may reward with justice those who believe and work righteousness, but those who reject Him will have nothing but draughts of boiling fluids, and a Penalty grievous: because they did reject Him." (Chapter 10, verse 4), "Or, who originates Creation, then repeats it, and who gives you sustenance from heaven and earth? (Can there be another) god besides God? Say, Bring forth your argument, if ye are telling the truth!" (Chapter 27, verse 64); "See they not how God originates creation, then repeats it: truly that is easy for God. Say: Travel through the earth and see how God did originate creation: so will God produce a later creation: for God has power over all things." (Chapter 29, verses 19,20) and "The Day that we roll up the heavens like a scroll rolled up for books (completed) - even as We produced the first Creation, so shall We produce a new one: a promise We have undertaken: truly shall We fulfill it." (Chapter

21,verse 104). To solve some of the intricate problems of big bang creation, we had to take recourse to the "inflation" theory at the initial moments of creation; we do not know if such an argument for the reverse of it, a "deflation" at speeds far beyond our concept, may come up for initiation or modulation of a "Big Crunch" at some stage, thus expediting the process.

The Quran refers to periods of time as Day in a number of places, "The angels and the spirit ascend unto Him in a Day the measure whereof is (as) fifty thousand years"(Chapter 70,verse 4), "He rules (all) affairs from the heavens to the earth: in the end will (all affairs) go up to Him, in a (single) Day (or Period) the space whereof will be (as) a thousand years of your reckoning." (Chapter 32,verse 5), "The Day that He assembles you (all) for a day of Assembly, that will be a day of mutual loss and gain (among you)"(Chapter 64,verse 9). And in the context of creation, "He created the heavens and the earth in true (proportions): He makes the Night overlap the Day, and the Day overlaps the Night: He has subjected the sun and the moon (to His law) each one follow a course for a time appointed." (Chapter 39,verse 5), "If He so pleased, He could blot you out and bring in a New Creation: Nor is that (at all) difficult for God."(Chapter 35, verses 16-17). "God created the heavens and the earth for just ends, and in order that each soul may find the recompense of what it has earned, and none of them be wronged." (Chapter 45, verse 22); "Verily a day in the sight of thy Lord is like a thousand years of your reckoning." (Chapter 22, verse 47). Day is thus seen as a completely relative factor of time that is dependent on an observer and his disposition in space and dynamics of motion, gravity slowing down time and motion enhancing it. Thus nothing in this universe is absolute or real; it all belongs to a web of space and time structure. The double helix of DNA traps within itself all the information for the past present and future actions. The past for designing life itself, present for guiding the ongoing cellular functions and the future is locked in its memory for further applications. Without the DNA's intelligence and its storing ability, we would not exist. The only reality is the observer, which is actually not the body but the soul, or spirit, which utilizes the mind and its intelligence for all its factual presentation. The body is the destructible matter, and is a material part of the creation itself. The matter particles were first synthesized - then the soul or the spirit, was put in thus establishing the living being, to create the reality of our existence.

Structure of Space and Time:

We visualize real existence in terms of a three (time being the fourth) dimensional space. In theory a two dimensional space or even a linear single dimensional space can be visualized, but something which does not have any dimensions is in the domain of conceptual existence. Forces and energy as opposed to matter is not visualized with any assigned dimensions of space, but mass and energy are inter-convertible, energy being equal to mass times the square of speed of light ($E = mc^2$). This huge release of energy from spontaneous conversion of matter is experienced in the atomic and hydrogen bombs. In the cosmological context just as the beginning of creation is without any space - once created the available space becomes infinite in terms of the expanding universe. The existence of space becomes intertwined with time, at the beginning both time and space is zero, and from then on the space occupied by the expansion can only be seen in the context of time, as the time passes the evolution of universe spreads further into space.

The concept of physical time is an essential part of our existence, which is however different from our mental experience of time. Our mind biologically visualizes time separated into what we call periods of the past, present and future, which we perceive individually through the experience of various events compartmentalized in our mind. In physical term it is only another dimension besides space (confined to the dimensions of length, breadth and height), for every event or object in the universe. Time is an integral part of the space-time web; it not only describes our existence in space, actually one of them (time) cannot exist without the other (space). The whole scenario of creation is only one unit of creation, with a time dimension within a space-time web, the entirety from the beginning to the end (or a continuum to infinity) is one cosmic unit of Creation. To the Creator past, present and future all merge into one unit of cosmic dimension. Thus time is dynamic only to us and our individual perception. This may be different for different observers, depending on their positions in the space-time web.

When we see an event happening or is being perpetrated by us, the concept of now and then, creates an illusion of past, present or future. If I record the whole scenario of a soccer match or any such events, and later

on play it to an audience through the television, without mentioning it as a recording of a "past" event, the observer will perceive it as a current (live) show. Every action and all activities will come as it takes place in "future" to him and all the actions of the individuals (recorded) therein, will be as per their own "free will" or conscience. But to me, who has recorded the event it will all be a known (or predetermined) activity (even when watching it all together). Thus the same event in the context of past or present (or future) is only obvious to the observer in the context of his disposition.

A physical analysis of time and the role of an observer can be elucidated by imagining a space travel. The individual in the space ship traveling at nine-tenth the speed of light (167,000miles per second; not possible to achieve presently), time will be conceived slowly, to the extent of about half the speed of what it will be to the earth bound controller of the ship, based on mathematical calculations as per Einstein's theory of relativity. The space traveler will also feel the distance to his goal, as half of that being conceived by the earth based controller, thus making the journey take the same time for both the observers. Because we know the physical laws behind it, there won't be a problem calculating it without any misunderstanding. The traveler will also perceive it as a normal time, because all his mental and body functions, as well as his watches would adjust to the slowed down speed. Thus when we calculate everything with the four dimensional approach, they will remain the same for both. This exemplifies the "now" of time as perceived by different observers set at a different space-time matrix to be different only as a mental conception. All our events are present as dots in the space-time web of the universe, where past, present and future exist as a perennial whole (unit).

Thus to the Creator Himself, the beginning is as close as any other event, which may appear to be subsequent only to our mind's perception or conception. Our "fate" or destiny, is known to the Creator Himself; but it still leaves us with the complete freedom of will to do the right things and save ourselves from the wrong things, as dictated by our conscience (the result is in the future to us, but known to the Creator Himself). So far we are the only animal in the universe known to have this faculty. Our actions in the past, present or future is so, only to us and our mental conception;

they all belong to the matrix of space-time web and everything is known at the same time to Him and Him only. We have been bestowed with the privilege to act according to what is right or wrong, as defined by the society, or more appropriately by the spiritual Guidance of the Creator³⁷ (God's Purpose in and Beyond Time - Russell Stannard, **Evidence of Purpose Scientist Discover the Creator**, Continuum, New York, 1994).

In the language of holy Quran, "Every man's fate We have fastened on his own neck: on the Day of Judgement We shall bring out for him a scroll, which he will see spread open. (It will be said to him:) "Read this (own) record: sufficient is thy soul this day to make out an account against thee. Who receiveth guidance, receiveth it for his own benefit: who goeth astray which is most right (or stable), and giveth the glad tidings to the Believers who work deeds of righteousness, that they shall have a magnificent reward. And to those who believe not in the Hereafter, (it announceth) that We have prepared for them a Chastisement grievous (indeed)" (Chapter 17: verses 13-16).

The quotations above makes it clear that we and only ourselves, are responsible for all of our actions and we will be judged accordingly, because all the records are a part and parcel of our earthly existence.

Chapter-III. The Science of Reality

The Quantum Theory:

Quantum theory is a brilliantly successful practical branch of physics. This has helped us in developing the laser, the electron microscope, the transistor, the super conductor and nuclear power, and is showing us the path to many other wonders of science yet to come. It explained chemical bonding, structure of atoms and its nucleus, conduction of electricity, the mechanical and thermal properties of solids, the stiffness of collapsed stars and many other cosmological explanations. Uncertainty, is the fundamental force behind the quantum theory, and brilliant scientist like Albert Einstein refused to believe it. Under concept of this theory, motion and position of anything cannot be determined at the same time, which means that cause and effect cannot be ascertained simultaneously. Indeed, as per the concept anything can come up anywhere without a causative factor behind it. As such the orbit of electrons inside atoms cannot be exactly determined (it can only be assigned an energy level, which we equate with an orbit or shell), causing a hazy envelope of electrons around the nucleus, seems to be the only practical solution of an exact statement. According to Bohr, the fuzzy and nebulous atom sharpens into a reality when an observation is made. Under this bizarre theory cause and effect can happen independent of each other; that is an effect can be independent of its causative factor. Thus electron from an electron gun will appear on the screen where it is pointed at, all by itself and at a place of its own choosing. Unless the receptor co-operates in receiving it as and when so assigned by an observation.

The "ghost theory", states that if a particle explodes into two fragments rotating clockwise and anti-clockwise, and are allowed to travel independent of each other to great distances wide apart, each will carry the ghost image of the other particle. When an observation is made of one of the particle showing its rotation as clockwise (or anti-clockwise), the other particle will automatically shed its ghost and show itself as rotating anti-clockwise (or clockwise), without any apparent means of exchange of information between the two. It is a baffling and a paradoxical fact, and even Einstein would have gladly agreed with it, just to know how the

particle being observed subsequently knows what the other particle has opted for, without any known means of communication between them. Many experiments have been designed, only to prove that the actual observation determines the reality, eliminating the ghosts. Thoughts and such bio-communications can be done spontaneously, at a speed of their choice, without being chained down by the present day laws of physics, which itself has as yet offered no satisfactory explanation of thoughts, minds, intelligence, souls and all such bio-force or biological energies, even though they form integral part of our physical world.

Role of an Observer:

The scenario of space-time web is also very much dependent on observation by an observer. When we look through a telescope and see a star one million light year away, it means that at the time of our observation the light from the star is reaching us after traversing a space of one million light years - the distance light travels in one million years of our time at 1,86,000 miles per second, which is 586,596, 000,000,000,000 miles. This also means that even though we are seeing the star at our present time it is actually the phase of its evolution as it was one million years ago, and it will still be visible to us even if it had died or exploded within this time period! If we are able to observe any part of the universe about 15 billion light years away, we will actually be observing the beginning of creation (presently believed to be between 13 to 18 billion years), as it was in its initial stages. The Hubble telescope in space is orbiting the earth 370 miles up above us, and is thus able to see everything clearly and without any interference, above all the haze and shielding effect of our atmosphere. It has already been able to see unto eleven billion years into the past and with further modifications due in 1999 and 2002 may be able to go back very nearly to the scenario of the time of creation itself. Dynamic time has different measures unique to an observer, depending on the relative speed and relative gravitational (or acceleration) measures in which he finds himself, and it is thus a personal concept.

The observation by our eyes are limited to the visible light spectrum and whatever we may see in the cosmic space will only be related to developments giving off photons or light waves. Other developments

resulting in emission of any other kind can only be observed through instruments developed for that purpose by us. It is obvious that without an observer, more specifically human beings, who are observing the whole range of cosmic developments directly or indirectly, the universe and consequently the creation can not exist. The universe in which we live has thus materialized as the only one out of the millions of other possible ones. In the language of the holy Quran, "I have only created Jinns and men, that they may serve Me. No sustenance do I require of them nor do I require that they should feed Me. For God is He Who gives (all) Sustenance, Lord of Power, steadfast (forever)" (Chapter 51, verses 56-58) and "Behold, thy Lord said to the angels: I will create a vicegerent on earth. They said, Wilt thou place therein one who will make mischief therein and shed blood? Whilst we do celebrate Thy praises and glorify Thy holy (name)? He said: I know what ye know not." (Chapter 2, verse 30). And for our guidance, "And call not, besides God, on another god. There is no god but He. Everything (that exists) will perish except His own Face. To Him belongs the Command, and to Him will ye (all) be brought back." (Chapter 29, verse 88), and "Verily We take upon Ourselves to guide, And verily unto Us (belong) the End and the Beginning" (Chapter 92, verses 12-13). Creation of human beings in the chain of His creation, is indeed to serve the purpose of a worship, which would include the search for knowledge and the modalities for creation to give us; and as His "vicegerent" and with His guidance, we are to serve the purpose for which we were created. The realization that our Creator is the supreme Commander, Designer and the Perpetrator of the whole of His Creation is indeed the best worship, and the prayers with their rituals are a grateful acknowledgment of the same. He is our guide, and from Him we came and to Him we are all destined to return.

Modality of any other evolution and development would give rise to an infinite variety of cosmic evolutions, including millions of other universes. But because of us, the human observers, who can observe the development of the present universe where we live, this model of universe, have become possible, and it has materialized itself. In some of the early Muslim literature, creation of prophet Muhammad (SAW) as the first step in our creation have been mentioned, and not only that but indeed God in His design had the whole of His creation predetermined³⁸ (**Nure Muhammadi** - Mowlana Shah Mohammad Abdullah, Sirat Library, Dhaka, 1977).

Alternative developments are thus eliminated by our presence, we being the integral part of the cosmic creation. Mathematical calculations reveals that under the set conditions of creations a very fine tuning is necessary to eliminate all other universes - universes without us, and such a design must have been assigned to it right in the beginning of creation by the Creator Himself.

The famous Schroedingers cat theory of the dead and live cat in a basket pierced with a sword (or left with a bottle of hydrogen cyanide gas, which can be broken by a chance hammering), states that the cat within will be dead and alive at the same time, one of them being a ghost of the other. Only when we observe it, after opening the basket, does the ghost get replaced by the actual reality of dead or alive, through our observation. Light has a mind and intelligence of its own, which shows up as a split personality in its behavior both as a particle or energy wave, depending on how we choose to observe it. There are many experiments, which have established this psychic and universal behavior of light. In Young's two Slit experiment, light passing through a small hole is allowed to illuminate two closely spaced narrow slits on another screen. The resultant image coming out is displayed on a third screen, where it will create a fine pattern of bright and dark bands called interference fringes. This is due to light's wave nature, arriving from each slit successively in step or out of step, with the peak or the trough of the waves. Even when a single photon at a time traverses the apparatus, the same interference pattern builds up. When the third screen is allowed to move freely, each photon coming out from one or the other slits builds up two blobs of light showing the particle nature of light. The same effect can be demonstrated for electrons, mesons or atoms proving inherent duality of nature. This change from the interference pattern to the individual spots is due to the inherent uncertainty of quantum physics. A moving screen allows independent observation for each particle as it comes, the screen bending to right or left depending on the impact of the photon particle, which makes each observation independent of each other. Whereas in the fixed screen their pathway through one or the other slit cannot be independently determined.

"O mankind! verily there hath come to you a convincing proof from your Lord : for we have sent unto you a light (that is) manifest" (Chapter

4, verse 174) and "God is the Light of heavens and the earth. The parable of His Light is as if there were a Niche and within it a Lamp: the Lamp enclosed in Glass: the Glass as it were a brilliant star: lit from a blessed Tree, an Olive, neither of the East nor of the West, whose Oil is well-nigh luminous, though fire scarce Touched it: Light upon Light! God doth guide whom He will to His Light. God doth set forth Parables for men: and God doth know all things" (Chapter 24, verse 35). This magnificent verse of Sura Nur (Light) is not only an awe inspiring description as conceived in parables variously explained by many scholars, of an all encompassing nature of light and a supreme statement the Creator (Allah), explaining His Own Nature, but can also be perceived in the direct conceptual meaning as unveiled through our scientific knowledge now available. He has herein opened up an explanation of His all Encompassing, Supreme and Sublime Authority and Power, which should make us bow down our head with submission, understanding and thanks. As stated, this indicates the Light of Creator having control over the light of His creation - an expanding primeval nucleus - the totality of the whole of cosmic universe.

From what has been said above, the role of human beings in the predetermined scheme of creation becomes obvious. The *weak* and *strong anthropic* principles states that: i) what we can observe is restricted by our presence as observer, and ii) the universe must be such as to admit the creation of observers within it. In both the cases it follows that had the universe different properties than what it is, we would not have existed and that a universe without life is an impossibility. The infinite number of all universes that are possible to have been created all exists, only the one with us as observers has materialized. This principle itself has been stated by some as a proof against the design of a creation, following from it rather than because of it. However, in either of the cases, without a design of the principle itself, this universe in which we are, could not have materialized from amongst the millions of possible modes of creation of universes, starting at the big bang. As we have seen, even this creation would not materially manifest itself without an observer. There are scientific experiments in which this role of us as an observer has been proven. When we allow an electron (or light) beam to hit an object in a fashion so as to deflect it or split it into, two equivalent and equal deflections to the right and the left, and set up machines to capture the electrons (or the light) to

measure it, we find that when we observe them singly either on the right or the left - the machines find them all to have emerged only on that side where it is being observed. Then if we eliminate our role as observer, putting up another machine to observe the result of the first one and then others to observe the result of the second machine and so on; eventually, when we see the result nothing materializes unless an observer is actually present when the measurements are made³⁹ (Quantum Philosophy - John Horgen, *Scientific American*, Vol.267, No.1, July,1992).

The conclusion from these experiments are that the observers (experimenters) are themselves involved in the nature of reality in a fundamental way, and that the cherished commonsense concepts about it, is completely demolished by quantum theory and its recent application in cosmology. John Wheeler in 1979 presented his conclusion that the decision to make a hybrid world (with us in it) come into one of the possible existence, can be delayed even after the world has come into existence! Wheeler claimed that the precise nature of reality has to await the participation of a conscious observer, who may come later on in the chain of creation. It includes retroactive creation of reality that existed even before there were human beings present as an observer. This can be understood on the basis of the experiment of clockwise and anti-clockwise rotating particles divulging from the same source (as reported earlier). The nature of its rotation as either clockwise or anti-clockwise becoming a reality on its observation spontaneously (without any apparent means of communication, and after a time lapse) making the other particle shed its ghost configuration (which could be either one), based on what we first observe for either of them. An observed clockwise rotating particle will automatically make the other one an anti-clockwise rotating particle (and *vice-versa*), even when observed after a time lapse from its origin. Of the millions of possible universes, only the one in which we are, have materialized. Obviously, this is because we are an integral part of the creation as a whole⁴⁰ (**Beyond the Black hole** - John Wheeler, *Some Strangeness in the Proposition: A Centennial Symposium to Celebrate the Achievements of Albert Einstein*, ed.H.Woolf, Addison-Wesley, 1980).

A hologram is a three dimensional picture produced by the interference pattern from a split laser beam, which can be projected or recorded on a photographic film, giving a three dimensional image of the object or an

individual. It can be also transmitted and projected in a way to give the illusion of the original object, which could be a live human being. With the advances now being made in science, it would be possible to make the hologram appear same as the original individual. In reality only one of them will be factual the other being an illusion only. Here also the role of a live observer will be necessary to substantiate reality of the object from its hologram.

In the holy Quran these scientific facts, which we realize now are recorded in an effective language, "Not for (idle) sport did We create the heavens and the earth and all that is between! If it had been Our wish to take (just) a pastime, We should surely have taken it from the things nearest to Us, if We would do (such a thing)! Nay, We hurl the Truth against Falsehood, and it knocks out its brain, and behold, Falsehood doth perish! Ah! woe be to you for the (false) things ye ascribe (to Us). To Him belong all (creatures) in the heavens and on earth: even those who are in His (very) Presence are not too proud to serve Him, nor are they (ever) weary (of His service): they celebrate His praises night and day, nor do they ever flag (weaken) or intermit (stop)" (Chapter 21, verses 16-20). See also ref.41: **Mahakal Sayare Manab Darshak** (Man as the Observer at the Sea of Time: in Bengali) - M.Manzur-i-Khuda, Brac Printers, Dhaka, July, 1998.⁴¹

Chapter-IV. Religion and Society

Social Evolution and Religion:

The established portion of human history as we know today is limited by our direct knowledge of written history; and the archaeological excavations only give us some ideas about life in the past. Even though the present family of human beings are known to have come about twenty-five (less than thirty-five) thousand years ago, the direct knowledge of our social behavior can be established with a reasonable certainty extending only for the last five to ten thousand years - the time after the recent ice age and flood which in the later religious books of the Old and the New Testaments and the Quran have been depicted as having taken place during the time of prophet Noah (PBH). This flood has been mentioned in all these religious texts and in the Quran it is said, "Relate to them the story of Noah. Behold! He said to his People: O my People! If it be hard on your (mind) that I should stay (with you) and commemorate the Signs of God - yet I put my trust in God. Get ye then an agreement about your plan and among your Partners, so your plan be not to you dark and dubious. Then pass sentence on me, and give me no respite. But if ye turn back, (consider): no reward have I asked of you: my reward is only due from God, and I have been commanded to be of those who submit to God's Will (in Islam). They rejected him, but We delivered him, and those with him in the Ark, and We made them inherit (the earth), while We overwhelmed in the Flood those who rejected Our Signs. Then see what was the end of those who were warned (but heeded not)!" (Chapter 10, verses 71-73). "So We inspired him (with this message): construct the Ark within Our sight and under Our guidance: then when comes Our command, and the fountains Of the earth gush forth, take thou on board pairs of every Species, male and female, and thy family - except those of Them against whom the word has already gone forth: and Address Me not in favor of the wrongdoers; for they shall be Drowned (in the Flood)" (Chapter 23, verse 27). The ice covered the earth, creating an ice age at least four times; alternating with periods of extensive erosions by glaciers and flooding when it melted. The last of these cycles came to us only about ten thousand years ago, and after the extensive flood the animals and the human ancestors of us who survived resulted in our

today's world. *Neolithic* or the modern man came only about 25-35 thousand years back.

Religion has been practiced by human society from the beginning of social existence of the present creed. Messengers and prophets came to us with God's message to help us establish ourselves in this world, for achieving a successful life in the Hereafter. If we believe in our Creator and His creation, giving us His Guidance from our inception, then He sent only one religion (Islam) from the time of Adam (PBH) rectified and modified with additions and alterations, for a supplementary-complementary guidance through the advent of prophets (guides) to every society. They have been identified by different names and by the prophets who brought them, for our own understanding. Islamic literatures state that Religion came to us through 1,20,000 prophets (according to some 2,20,000) with 313 Apostles, sometimes more than one at the same time, in all societies the world over. The Quran says, "For We assuredly sent amongst every People an Apostle, (with the Command) 'Serve God and eschew Evil': of the people were some whom God guided, and some on whom Error became inevitably (established). So travel through the earth, and see what was the end of those who denied (the Truth)." (Chapter 16,verse 36); "None of Our revelations do We abrogate or cause to be forgotten, but We substitute something better or similar; knowest thou not that God hath power over all things?" (Chapter 2,verse 106) and further, "To those who believe in God and His Apostles, We shall soon give their (due) rewards: for God is Oft Forgiving, Most Merciful." (Chapter 4,verse 152), and "The Religion before God is Islam (submission to His Will): nor did the people of the Book dissent therefrom except through envy of each other, after knowledge come to them. But if any deny the Signs of God, God is swift in calling to account." (Chapter 3,verse 19). Later on, with maturity of the human society, the religion of Islam was completed through the last of our prophet Muhammad (SAW),"This day have I perfected your religion for you, completed my favor upon you, and have chosen for you Islam as your religion." (Chapter 5,verse 3) and "Muhammad is not the father of any of your men, but (he is) the Apostle of God, and the Seal of the Prophets: and God has full knowledge of all things." (Chapter 33,verse 40).

The Vedanta of early Hindu religion says, "*Ishwar Ekamebad-ditium*",

this translated in Arabic is *la Ilaha Illallah* (there is no god but God). And states further that Creator is, "Eternal, Infinite, Devoid of Material Qualities, Devoid of Material Shapes, All Knowing, Unmanifested, One and Unique and a Soul beyond Countries and beyond Times, neither Static nor Dynamic." The Jews, the Christians and the Moslems believe in the same God - Jehovah in Hebrew, God in English, and Allah in Arabic, "Those who believe (in the Quran), those who follow the Jewish (Scriptures), and the Sabians and the Christians - any who believe in God and the Last Day, and work righteousness - on them shall be no fear, nor shall they grieve." (Chapter 5, verse 69); and "Mankind was one single nation, and God sent Messengers with glad tidings and warnings; and with them He sent the Book in truth, to judge between people in matters wherein they differed; but the People of the Book, after the Clear Signs came to them, did not differ among themselves, except through selfish contumacy (willful disobedience to God)." (Chapter 2, verse 213). Buddhism has also been stated to believe in God⁴² (**The Creed of Islam** -Abul Hashem, Islamic Foundation, Dhaka, 1980). The essence of all religion as we know it believes in a Creator and we are given the guidance, to follow the path best for our eternal life.

Hinduism is now acknowledged to be amongst the oldest of practicing religions. Some of the teachings and the interpretations of many of the older religions, including Christianity, have changed through passage of time resulting in numerous variations. The Quran is protected as mentioned, "No falsehood can approach it from before or behind it: it is sent down by One Full of Wisdom, Worthy of Praise" (Chapter 41, verse 42), and "Nay, this is a Glorious Quran, (Inscribed) in a Tablet Preserved!" (Chapter 85, verses 21- 22), mentioned as a guarded Tablet in another translation. No doubt being only fourteen hundred years old, the diligent efforts of religious men have made it easier. The human society belongs to a single brotherhood, "And verily this Brotherhood of yours is a single Brotherhood, and I am your Lord and Cherisher: therefore fear Me (and no other)." (Chapter 23, verse 52). To ensure uniformity in the Quran, during the caliphate of Uthman, about fifteen years after Muhammad (SAW), all the copies in use were collected and replaced with a standard copy according to the accent and dialect of Quraysh, which was used by prophet himself. The unique status of the Quran as the gift of God to humanity is that it acknowledges the previous revelations. It guides humanity to the

Straight Path to awaken the human conscience and enlighten it, using this world's facilities given to us for use and convenience only, the goal is for a happy and successful Hereafter.

As the best of his creations, "*Ashraful Makhhlukat*", through the ages we have developed our social and scientific progress. The history of scientific development started with religio-social developments. The invention of open form of wheel (the sign of swastika) - brought with it revolutionary progress, about five thousand years ago. Use of this symbol by Aryans who migrated to the east and initiated the class of priests of Brahmins in India, and in the west the Germans who claimed superiority of their Aryan decent and progress is well known. Use of copper and bronze was known seven thousand years back and iron followed later. First records of Pharmacy can be traced back to nearly six thousand years, to Cheops time (about 3,700B.C) and was further developed by the Egyptians, Chinese, Persian, Indian and Greco-Roman pharmacists until the fifth century AD and even today the Unani-Tibb, the Ayurvedic and the Chinese system of traditional medicines are well known⁴³ (**Pharmacy and Medicine Through the Ages** - Hakim Mohammad Said, Hamdard Foundation, Karachi, 1980).

The early social developments were controlled by religious leaders and during the Christian domination, the European society operated with a direct control of the church. Scientific developments, when it appeared to contradict the then current religious understanding were rejected and even some of the philosophers and scientists of those era faced execution (Socrates). Even much later (1633), We have seen the fate suffered by Galileo for his scientific conviction - the excommunication order of him was lifted only in 1984 by Pope John Paul⁴⁴ (*Times* - March 12, 1984). It was not until the times of Prophet Muhammad (SAW) that pursuit of knowledge and science in particular, received direct support from him, and later on also received strong support from the Muslim rulers of the time, creating the foundation of modern science⁴⁵ (Muslim Chemists of the Golden Age of Islam - M.Manzur-i- Khuda, *Journal of Islamic Thought and Scientific Creativity*, Vol.3, No.1, COMSTEC, 1992).

The very first message sent to us and recorded in the Quran states, "Proclaim (or read!), in the name of thy Lord and Cherisher, Who created - Created man, out of a (mere) clot of congealed blood: Proclaim! And thy Lord is Most Bountiful- He Who taught (the use of) the Pen - Taught man

that which he knew not."(Chapter 96,verses 1-5), and prophet Muhammad (SAW) himself said (**Illustrious Sayings of the Prophet of Islam** - Rashidul Hasan, Biswa Zaker Manjil, Associated Printers, Dhaka, 1980)⁴⁶: "Seek knowledge from cradle to grave"; "Who ever searches after knowledge, it will be expiation for his past sins"; "One learned man is harder on the devil than a thousand ignorant worshippers"; "The ink of scholar is more holy than the blood of the martyr"; "Search knowledge though be it in China"; "Reason is the root of my faith"; and "Knowledge (science) is my weapon". Modern Arabic even today uses "Ilm" as the only word for science, even though in its general meaning it includes all knowledge. His love for learning is exemplified by his order that a prisoner of war who agreed to teach some Muslim children can earn his freedom⁴⁷ (Muslims, the Pioneers of Modern Science - A.R.Nowshervi, *Hamdard*, Vol.23, No.3, Karachi, 1980).

The technological development of the present day world is what we understand as progress. Our affluency dictates that automobiles, houses or such other items, to be better if they are more expensive. The product of scholarly exploitation of knowledge of science handed down to us through the technology has become the measure of our development, leaving behind our intelligence and academic efforts of the sciences. Its products are a gift of an unseen source, materialised through our efforts for our worldly comforts. Ethical or moral values so very essential in social developments and taught to us through religious teaching are being forgotten. Until recently civilization was an indicator for moral and ethical developments, but now the industrialized world has developed a society of convenience in which it has become synonymous with material progress, thus taking away the integral role of religion as the code of life. Faith has been replaced by religious commands instituted by human convenience and initiatives, by accepting changes demanded by the modern living. The social developments with its intimate relationship of religious faith, science and philosophy, established by the Muslims in the past, is still reflected in naming the highest degree of science (and other subjects) as Doctor of Philosophy (Ph.D.).

Scientific Development and Faith:

Scientific facts amounts to the understanding of Nature and the natural phenomenon; and scientific discovery is nothing more than a logical

disclosure of facts carried out through experiments and observations of its results. It is the unveiling of the secrets of Nature, which our human mind is always trying to achieve. Obviously, there is no conflict between Faith and Science, both leads to the knowledge given to us by the Creator as His spiritual and material guidance. Albert Einstein observed, "Religion without science is blind. Science without religion is lame." J.B.S.Haldane states, "The wise man regulates his conduct by the theories both of religion and science." Paul Davies observed, "The early attempts by the church to hold back the flood-gates of scientific advance have left a deep suspicion about religion among the scientific community. For their part, scientists have demolished a lot of cherished religious beliefs and have come to be regarded by many as faith-wreckers"⁴⁸ (**God and the New Physics** - Paul Davies, Simon and Schuster, New York,1983).

The fact is that in today's society we have developed a system of compartmentalized education system wherein the religious school sometimes teaches religion with very little, if any, of science and scientific understanding. And on the other hand the scientific and other worldly subjects are taught without reference to any religious understanding or knowledge of religion. Indeed, our scientific world ignores religion altogether as a source of spiritual knowledge, only being concerned with our worldly material knowledge. This becomes more problematic when we preach secularism, which instead of allowing all religious faith to have their equal expressions, frequently does not allow room for any Faith at all. It becomes more complicated with conflicts of various religious faiths amongst themselves. Islamic faith even with its present day political problems in the countries propagating it, presents no conflict between pursuit of religious and worldly education - it is limited by their inherited education system which does not allow much communication between the two. Thus most of the religious knowledge coming from men without scientific understanding becomes "blind" and the scientific knowledge from people without any religious understanding remains "lame" as observed by Einstein. Charles Townes, the Nobel laureate in laser technology said, "Science wants to know the mechanism of the universe, religion the meaning. The two cannot be separated"⁴⁹ (*Science*, Vol.277, 15 August, 1997).

Going back to the history of building up the foundation for modern scientific development, we see that Alchemy was introduced as a science; whereby base metals like lead was attempted to be transformed into gold (and silver), the symbol of immunity from deteriorating influences through use of a juice, *Hataka* as mentioned in the early 2nd.- 4th. Century AD by Avantamska Sutra in India, brought in enthusiastic chemical experiments towards achieving it. Even though it never appeared to have delivered the promised transformation, the enthusiastic approach brought with it a great deal of chemical discovery that formed the building blocks for all future developments⁵⁰ (Alchemy as Branch of Medicine - S. Mahdihassan, **Essays on History of Alchemy, Medicine and Drugs**, Hamdard Foundation, Karachi, 1982). The "*Rasayana*" philosophy, chemistry in today's language, went to Greece via Egypt as Kimiya and transliterated as Chimia - which claimed a philosopher's stone or an elixir of a sulpho-mercurial complex as ferment, changing not only base metal to gold but dead metal to live gold. This intimate faith of relationship between religion, science and philosophy started the alchemist's pursuit for a solution through allegories, symbolism, occultism, mysticism and theosophy. The astrological and cosmological interpretations, in their search were frequently expressed in poetical terms of imaginative methodology and through their impact, occultism and theology became strongly integrated with alchemy. This came with the foremost concern for preserving good health and cure of diseases, not necessarily limited to making of gold - and thus brought in the first applications of iatrochemistry, the art of preparing drugs by chemical methods. Thus various potent drugs and chemicals were brought into use for cure of diseases⁵¹ (Islamic Alchemy - Sami K. Hamarneh, **International Conference on the History and Philosophy of Science**, Islamabad, 1979).

Alchemy was not an exact science, but knowledge of sciences particularly the chemical sciences, evolved from these efforts. An exact foundation for science, required the use of mathematics as its primary language and through the unerring perseverance of scientists and philosophers many of whom were acknowledged religious leaders of the day, brought in the developments of today's algebra, trigonometry, geometry, arithmetic and calculus from their efforts of about eight to twelve hundred years ago.

The advent of Islam after the fall of Roman Empire brought in a new era of initiatives through scientific and technological development. Muslim scholars, who were frequently both scientific and spiritual leaders, laid the foundations of modern mathematics, astronomy, medical science and chemistry (through the earlier alchemy). The guidance of prophet Muhammad (SAW) himself, urging not to be simply a narrator of Ilm (knowledge and science), but try to examine, verify and put to test all that we are told, in order to help ourselves to find the ultimate truth - helped in the establishment of a Golden Age of Islam⁵² (History of Muslim Contributions to Chemistry - Mohammad Saeed Aryane, *International Conference on Science in Islamic Polity*, Islamabad, Pakistan, 1983). The renaissance in Europe and the scientific and industrial development that followed was made possible by the great advent of Islam with its enlightenment spreading to Spain in the north and India and the east. The hub of its Development centered in Damascus (in Syria), Baghdad (in Iraq), And Cordoba (in Spain). The development followed the Ummayyads, The Abbasids and the Caliphate in Spain (Abd al-Rahman of Arab decent fled from the defeated Ummayyad dynasty in 755AD to establish it). The grandeur and over indulgence in the worldly riches brought the downfall of the Muslim rulers. The Muslim dominance in Spain survived for a long time, during which the western scholars had to go to Spain to learn and discover the advances in science and the progress that came with it. End of the fifteenth century AD saw the advent of Christian kingdom of Ferdinand and Isabella. One of the first actions after such conquests in the north as well as in the south of Spain later, was to burn each of the books of the great libraries established by the Muslims, and the treasure of these information are all lost to us. The colonial rule in the nineteenth century world effectively brought in a Dark Age for the Muslim countries, and now the opportunities are opening up again for the people of the world to join in. A mountain is always the first thing that is visible from a distance, but can actually be a long journey before we can reach and climb it.

Development of Modern Science:

Study of most of the physical sciences in the nineteenth and early twentieth century was included in the subject of chemistry. In the Middle Ages, the same individual very frequently delved at great length in the

science subjects which we now know as botany, astronomy, pharmacy, chemistry, mathematics, medicine, biology, physics etc. Al-Kindus carried on work on various aspects of astronomy, mathematics, medicine, pharmacy, geography, physics, logic, psychology and philosophy. Abu Musa Al-Khawarizmi discovered the principles of algebra and his book *Hisab-al-Jabr* appears to have given the name Algebra to the subject, and this is in addition to his contributions on the subjects of geography and astronomy. Al-Biruni was an astronomer, in addition to being a biologist, pharmacist and geographer in his own right. Avicenna was a great astronomer, biologist, pharmacist, physicist and geologist with impressive contributions in all the subjects. With our ever expanding knowledge even chemistry today is divided into the subjects of Industrial Chemistry, Organic Chemistry, Medicinal Chemistry, Pharmaceutical Chemistry, Inorganic Chemistry, Physical Chemistry, Nuclear Chemistry, Bio-Chemistry and more.

The help offered by religious leaders and the rulers of the day made such pursuits a welcome progress, and in many cases huge rewards were offered to patronize such efforts. The large investment for organizing, establishing and maintaining hospitals for health-care of the population and for the medical practices under the patronage of the early caliphs of Islam, is well documented (Hamarnah). Jabir Ibn Hayan, the founder of modern chemistry was a great alchemist of his times and his efforts led to the refinement and discovery of many basic chemical techniques in practice and therapy. This includes refinement and invention of apparatus for the chemical process of distillation, sublimation and calcination. The foremost amongst scientists who did not believe in effective basis of alchemy was Ibn-e-Sina (Avicenna, 980-1037 A.D) and his famous treatise "Canun" is the foundation of Greco-Arabic school of medicine. This was the accepted textbook on the subject in the European Universities until 1650 AD Avenzoar (b.1113 A.D) was opposed to mysticism and astrology, and left behind important works, which influenced subjects of pharmacy and alchemy. Iatrochemistry developed from the alchemists approach for using elixir of life (*Haoma, the juice of Ephedra*) extolled for the drug of longevity and even immortality. Al-Biruni's *Materia Medica* (c.1000 A.D) refers to the *Ephedra* juice as *Hum-al-Majus* as an energizer cum euphoriant. The "spirits" extracted from plant materials for ointments and

aromatic waters, is a natural pharmaceutical useful in the healing of many ailments. We find this spirit of alchemy still pervading us, in the development of modern pharmaceutical chemistry, and medical science. We have established the transmutation of elements by radioactive transformations, and developed many medicines from various health-giving plants, and other natural sources. Some of the synthetic drugs have been developed based on a natural model for a more profitable and easier dispensation. The human aging process has been established as a disease of the mind and body, for which we are constantly looking for a cure and recently we have been able to identify a gene responsible for it. We have established that many of the body chemistry could be moderated or controlled through our thinking itself, and our own spirit or soul remains the immortal self as created by the Almighty for using the privileges of this world as given to us, "(To the righteous soul will be said:) O (thou) soul, in (complete) rest and satisfaction! Come back thou to thy Lord-well pleased (thyself), and well-pleasing unto Him! Enter thou, then, amongst My devotees! Yea, enter thou My Heaven!" (Chapter 89, verses 27-30).

The benefit of iatrochemistry has helped directly in the development of modern medicine, and the Islamic medicine of the Unani or Tibb systems and the Ayurvedic medicines of the Indo-Arab system is still effectively flourishing in the sub-continent of India. The penetrating assessment of Ibn-e-Khaldun in fifteenth century ended the heyday of the alchemists, and brought an end to the developments, which became independent of alchemist's philosophy, but the exact sciences of today are greatly indebted to the spirit and contributions of the alchemists of the past. A short list of some of the important scientists of the Muslim Golden Age is appended at the end. It should be understood that the scientific progress through the ages has been a continuous affair. The golden age of the Muslim scientists however deserves to be highlighted because of the all out religious support that it achieved during the time.

Science in the Light of Human Progress:

God gave us the knowledge and wisdom to lead a useful life on the face of this earth. The wisdom developed through centuries of human existence has revealed many of the secrets of Nature for our own benefit. The moment of realization of truth by Newton, when he realized that falling

apple from the tree does so because of an attraction by earth, led him to elucidate the elegant theory of Gravity. The observation of dancing iron lid of the heavy iron kettle, with water boiling in it, helped Stephen in elucidating the power of steam; and it resulted in the development of steam engine. Archimedis' principle was realized, by observation of the simple process of displacement of equal volume of water that overflowed from the tub when he entered it for taking his bath. It made him realize that a specific relationship exists in all matters, between its own weight and the weight of the volume of water it displaces and is different for each individual substance. This allowed him to determine if the gold crown of the king was of pure gold or not, without ever breaking any portion of it. And his well-known dash from the bathtub without any robes, shouting "*Eureka*" (I got it) is well known. The discovery of penicillin - resulted in a very novel group of medicine, the antibiotics of today, was also based on an equally accidental observation when some of the petri dishes did not allow growth of inoculated bacteria because it had come into contact with a mold that contained the new product penicillin. A modern scientist observing and correlating facts of his experiments heavily relies on the conscious or unconscious moments of realization of truth, which results in the discoveries of science. The explosion of knowledge that came to us through the recent decades has forced the human society through a rapid phase of development and discovery. The technological output has changed our lifestyle and the basic social demand for our day to day existence has also changed with it. This has resulted in the very basic ethical conflict of modern society and the inherited social values given to us by religious faith. The design of the cosmos and life in it has been made possible through the "*Qudrat*" (Power of Sublime Authority) of God. The Nature or "*Fitrat*" could not have evolved only through coincidence and accidents. The sheer complexity of the creation with us as the observer in it would have been a statistical impossibility for each of the evolutionary phases. The importance of religion as guidance for this life, in which we are to follow the right path prescribed by our Creator, to enable us to achieve the goal of reward (or punishment for failure) is well understood. The Quran says, "This Is the Book: in it is guidance, sure, without doubt, to those who fear God: who believe in the Unseen, are steadfast in prayer, and spend out of what We have provided them; And who believe in the Revelation sent to

thee, and sent before thy time, and (in their hearts) have the assurance of the Hereafter. They are on (true) guidance, from their Lord, and it is these who will prosper." (Chapter 2, verses 4-5). Most of us betray an intellectual crisis when it is mentioned that religion's role is not limited to personal spiritual guidance and training of the human virtues but it actually incorporates total guidance that includes our material day to day living. In case of Islam it is stated to be a guide for all of us and in the language of Muhammad Qutub, a progressive thinker of recent times, Islam is not a mere creed, nor does it represent simply an edification of souls, or a refinement and training of human virtues but is rather a harmonious whole, that includes a just economic and a well balanced social system with codes of civil, criminal as well as international law. This flows from the same fundamental creed of Islam and its moral and spiritual temperament. The Quran says, "They impress on thee as a favor that they have embraced Islam. Say, Count not your Islam as a favor upon me: Nay, God has conferred a favor upon you that He has guided you to the Faith, if ye be true and sincere." (Chapter 49, verse 17).

Science and Islam is a Path to Progress and Peace:

The aspiration of human beings has always been to achieve progress through peace. The very instruments through which we want peace, the development of science and technology, not only creates material progress but is also delivering to us the very sophisticated weapons of self destruction, which we want to use to defend ourselves against the oppressors. This century has seen us through two great world wars, and since the end of the second one in 1945 we have made it possible to keep up fighting each other through regional wars, wherein all the world powers have been equally active directly or indirectly. We have seen wars in the Middle East, in Asia, in Africa and in Central and South Americas and in parts of Europe without a single day's rest. Wars have actually become an instrument of destruction through which we are trying to establish the superiority of brain (intelligence) over brawn (strength) at the cost of great human sacrifices. We have commercialized wars for our own economic benefits. The benefits of developing war machinery have a long-term effect as can be observed through the spread of pain and misery to the children and the women by the land mines and many other war devices.

The world commerce runs on the basis of production and consumption to establish a profitable trade. The tobacco industry with high-pressure advertisement and salesmanship captured a great world market, and now we realize the very dangerous consequences to which it has led us. Similarly, the production and marketing of narcotics all over the world is still on the rise. But our best efforts seem to be achieving very little progress except creating new markets by trying to phase out the old ones. Similarly, the so called safe chemicals used in our food materials as additives, preservatives, and to improve its color and smell, together with the agricultural chemicals which we ingest indirectly, keeps on expanding. When proven dangerous, they get replaced with better products without any assurance of long term assurance of their safety. All our ailments keep on getting multiplied in spite of the fact that we are constantly improving our standard of living and the quality of life. Actually, the peace of mind that our past generations had, does seem to be replaced by an expansive material demand, without being able to bring in the peace of mind, which becomes more elusive than ever.

We now have to define our goal to enable us to stop the inevitable self-destruction to which we are pushing ourselves. The destruction of the green belts, by indiscriminate deforestation, the damage to the ozone layer by the exhaust fumes of the automobiles, and the over fishing in the waters is not going to help us. The purely material goals that we keep on making, devoid of any spiritual consideration may be helping our body to achieve some short lived comforts, but our mind and soul are starving from its consequences and the associated dangers. This is where the value of our religious teaching can be perceived for our peace of mind. If we make the world as our goal, we may be able to amass millions or even billions of "dollars" but our mind will not be satisfied and in most cases the burden of wealth tends to bring in more misery than it solves. When we establish the right choice of making the Hereafter our goal, and use this world only for our convenience, just the same as we use our clothing, house or furniture, the solution will be easy to achieve. The Quran says, "Before this We wrote in the Psalms, after the Message (given to Moses): My servants, the righteous, shall inherit the earth." (Chapter 21, verse 105).

Indeed, as has been explained in the context of time and space, all the material elements when broken down to its components shows that not only

ourselves but the whole of the universe is an empty space (99.99999%) filled with sub-atomic particles moving with vibrating energy with bundles of information making the live matters perform all their functions. In effect all matter is nothing more than a mirage of illusion, the only truth being our spirit (soul) which enjoys the facility of our body and mind but is not confined to it. The eternal existence that we are to enjoy belongs to our soul and in the language of the Quran, "One day every soul will come up struggling for itself, and every soul will be recompensed (fully) for all its actions, and none will be unjustly dealt with." (Chapter 16,verse 111). The great spiritual leader, philosopher (and scientist) Hazrat Abdul Qader Jilani (RA) said, that the Quranic ordainment, "*Amru bil ma'aruf, nahi anil munkar*", to do good things and prevent others from doing bad things is equally applicable for all. His instruction goes on to say that the intelligent, educated and adult Muslims must try to attract people towards doing the good things and prevent them from going astray. In the present day world what we see as enjoyable, turns out to be an illusion, eventually proving its harmful effect. This is exemplified by use of the narcotics (or the tobacco and alcohol), which shows their ill effects only after we get used to them. The taste of the smoke to the beginner is surely most obnoxious, but we get attracted by the illusion of pleasure derived from them. After our body chemistry gets used to the nicotine of the tobacco, the relief that its use brings to us, inevitably acts as the pleasure for a short while of our time in this world and then we live the rest of our life to repent for its harmful effects. An addiction to only a worldly goal, may have the same consequence for our Afterlife.

The material world has led us to develop some materialistic philosophy of life, limiting our goal to the world itself. The failure or limitations of the communist society has recently been exposed in the changes of the earlier Soviet Union. The welfare society of the European countries like Sweden is facing a crisis within itself and the free democracy is finding it difficult to come up to the expectations of its promises. All this is happening only because we are trying to formulate material goals with a very fluid and changing spiritual standard within it. Religious life on the other hand lays its emphasis on the after life and the material benefits of this world remains for our use as long as we are alive. The moral and ethical values for the way of life showing the path is not an integral part of a materialistic society,

making its own norms based on changing attitudes to-wards right and wrong, good and evil or even justice and injustice, or success and failure. Looking unto an ideal Islamic society the leader is nominated by the choicest representatives of the society - a leader does not have to be elected through material promises, which may be hard to deliver. In many of the countries of the world this is breeding corruption instead of helping the social cause, sometimes accepting right as wrong (or vice-versa), only on "popular" demands. Even developed countries are having their problems. It has become a case of entropy applied to our worldly living; disorder is increasing when it is compared to what we had before. But even though the case of making a negative entropy is not easy; the case of overall entropy of the universe, is what we can easily or effectively push back for our own benefit. One still can have a better order here on earth, still keeping our mathematical entropy balance within the universal whole.

The universal brotherhood of man is a utopia under our conditions of world politics. Mutual understanding of give and take is not difficult to achieve, if it creates a wining situation for everyone involved. Within our social environment we find loving persuasion able to work miracles where mere force fails. The same is true not only in the national context but is equally true in the context of international politics. In our day to day life the pleasure and sorrow that we feel are felt by our soul through our mind and body facilities. Indeed, the psychosomatic diseases are real ailment, which are physically absent (or caused by our own mind), but still very much felt by our ourselves. The peace of mind as we call it has to be earned through our conscious efforts, even in this world. So why should we doubt its role, when it comes to its eternal existence to come? The reward and punishment of the soul comes through our material actions in this world to be carried over for our own benefit (or punishment) in the Hereafter. In language of the Quran, "To any that desires the tilth of the Hereafter, We give increase in his tilth: and to any that desires the tilth of this world, We grant somewhat thereof, but he has no share or lot in the Hereafter" (Chapter 42,verse 20), "But if the enemy incline towards peace, do thou (also) incline towards peace, and trust in God: for He is the One that heareth and knoweth (all things)" (Chapter 8,verse 61), and for the righteous, He extends, "Peace! - a Word (of salutation) from a Lord Most Merciful!" (Chapter 36,verse 58) and "Those who desire the life of the Present and its glitter- to

them We shall pay (the price of) their deeds therein -without diminution. They are those for whom there is nothing in the Hereafter but the Fire: vain are the designs they frame therein, and of no effect are the deeds that they do!" (Chapter 11,verses 15-16). We pray for a successful transformation of our worldly attitude, to enable ourselves not only to open the door for our goal of the Hereafter, but to utilize the same effort in pushing us up to our success in this world. "God will certainly aid those who aid His (cause); for verily God is Full of Strength, Exalted in Might, (Able to enforce His Will)" (Chapter 22,verse 40) and God has assured us of rewards and punishment for our eternal life to come based on how we choose to utilize the time on earth, "Are (these two) alike? - One to whom We have made a goodly promise, and who is going to reach its (fulfillment), and one to whom We have given the good things of this life, but who on the Day of Judgment, is to be among those brought up (for punishment)?" (Chapter 28,verse 61), "God created the heavens and the earth for just ends, and in order that each soul may find the recompense of what it has earned, and none of them be wronged." (Chapter 45,verse 22). "Rabbi Zidni Ilma - O my Lord! advance me in knowledge."(Chapter 20, verse 114).

Chapter-V. Nature - the Miracle of Creation

Place of Faith:

Albert Einstein refused to believe that we are living in an expanding Universe, and to make mathematics obey his faith of scientific understanding, in his equations he introduced a "natural constant" to make room for a stationary universe. Eventually, he accepted Hubble's expanding universe theory and admitted that the introduction of the natural constant was the biggest mistake of his life. He also refused to believe in Heisenberg's theory of uncertainty and the quantum mechanics, insisting that "God does not play dice", that is as per his conviction everything had to be as per exact law with known outcome. But even though the scientific faith of this great giant of an intellectual did not agree with some of the accepted basic fundamentals of our present day science, we do not doubt the facts, as they are observed today and proven by experiments.

The completely self-contained universe without a boundary, now envisaged by Hawking, eliminates the singularity of a classical big bang evolution. Thus as per his conviction, brings in a universe without a beginning (and an end). To achieve this he had to use an "imaginary time" in his equations. Actually, scientists have been using the imaginary number " i " to signify square root of minus one (-1), which in a mathematical concept is an impossible number and thus "imaginary" number. But the use of an "imaginary time" appears to mean that the actual or real time we are living in is not being followed by the equations solving Hawking's theory, which satisfies his projected solution. The Euclidean space-time (with Imaginary time) in Hawking's projection has been described by him as a mathematical trick, and it satisfies his comprehension of a beginning without a real point of creation. Which can be argued to be also an "*imaginary*" point of creation based on the mathematical devices utilized to satisfy his quest. The imaginary time in real co-ordinates can make our existence imaginary, unless of course we accept imaginary time as our real time. Actually, Hawking himself believed in the singularity of creation, signifying creation at a particular moment in space and time, which he had proposed earlier on. But later on, in his attempt to find a mathematical solution to explain singularity, he eventually modified it with the use of an

imaginary time. In this context the use of natural constant by Einstein to satisfy his theory of stationary universe comes to mind!⁵³ (**A Brief History of Time** - Stephen W.Hawking, Bantam Books, New York, 1988). Earlier on in this book, I have made an argument through the general and special relativity considerations, explaining creation from a singularity in which the time factor remains at zero while the cosmic egg is created ready for the "big bang" of creation. This logical argument when transformed into a mathematical equation, can satisfy singularity and a point of creation for this universe in which we are living as observers.

Bondi is very critical of religious faith, and states, "Generally the state of mind of a believer in a revelation is the awful arrogance of saying I know, and those who do not agree with my belief are wrong" and goes on to say, "Since at most one faith can be true, it follows that human beings are extremely liable to believe firmly and honestly in something which is untrue in the field of revealed religion."⁵⁴ (*Religion is a good thing* - H.Bondi, **Lying Truths**, Eds. R.Duncan and W.Weston-Smith, Pergammon Press, 1979). Scientists are more frequently than not eccentric about their own ideas and beliefs, and indeed, this challenge helps in success with many discoveries. Knowledge brings with it new facts replacing sometimes the old Ones, but that does not change our attitude for science, because faith in material observations are easy to accept on the basis of new observations. Sometimes our own arrogance of trying to establish some scientific conviction, can be changed on the basis of new observations or findings.

George Ellis, a cosmologist in the University of Cape Town, has a huge amount of data supporting the existence of God, and the father of modern Astronomy Allan R.Sandage says that you have to answer the question of what is sufficient evidence, yourself⁵⁵ (*Beyond Physics - Scientific American*, August,1998). With the scientific knowledge of creation showing us the path to an understanding of the Creator and our role within it, should make it possible for us to have an understanding of our eternal life to come, for which this material life is given to us to earn our way. This conflict within ones mind of religious and scientific "faiths" can be resolved if we accept that there can only be one Creator and that He has been sending prophets to us only to show us the right path to follow in our worldly life. Thus giving us a code of life for our own benefits, some of which we ourselves have corrupted or changed to suit our own convenience. Basically

only one religion with later modifications came to us. Religions, as we know them today have compartmentalized themselves into various groups, just as the political systems work differently, in People of various Nations. A genuine effort of human understanding leaving behind our ego can make the religious Faith easily identifiable as the perpetual science of social development or that of Nature itself.

The Natural Constants:

Scientists would like to have answers to the various laws and the constants of Nature that we observe today. Some of the questions are:

- i) why the electric charges come in the exact values that we find them to carry,
- ii) why are there three (or possibly four) families of quarks (and leptons),
- iii) why the masses of elementary particles are what they are,
- iv) why the fundamental forces are only the four, as we know them to be,
- v) why the forces have the widely different values.

There is no reason as to why the natural constants come in the values that they do, nor is there any reason for the laws of physics to be what they are derived to be. The fundamental numbers like the size of electrical charges of electron and protons and the ratio of their masses are fixed in nature. A slight deviation of these values even to the extent of one in billions would have made the stars either incapable of burning hydrogen to helium, or else make them unable to explode when so required by their functions, thus making the whole scenario of cosmic creation as we know them now impossible. Consequently, life and evolution as we know them today would never have materialized.

The exact energy levels in the nuclei of carbon and beryllium atoms resulted in the lucky synthesis of life from the oxygen and carbon atoms, which evolved from them. Three helium nuclei with just the right energy level, or the oxygen synthesized from carbon and helium, made life possible. If the neutron was even 0.1 per cent heavier than proton, this difference would have made it impossible for decay of neutrons to protons in the early big bang era. While a slightly heavier mass of protons will make

it decay to neutrons, and positrons which after annihilation by the electron carrying the opposite charge, would have left nothing but neutrons in the whole of universe.

Slightly stronger "strong force" would have resulted in di-protons (two nucleus of hydrogen), instead of the normal slow burning (through nuclear fusion) hydrogen in the stars (including our sun), resulting in catastrophic explosion leaving behind only helium, the product of the fusion. A little weaker force on the other hand would not have been strong enough to hold the proton and neutron in the atoms eliminating formation of all elements and thus matters, as we know them today.

There is no reason as to why the natural constants have come in the values that we observe them to have, nor is there any reason for the laws of physics to be as we observe them to be. Gravity or the weak and the strong nuclear forces could have been a little stronger or weaker with very different evolutionary sequences. Similarly, the mass and the charges of protons and electrons could have been a little more or less than what they could be. There is no fundamental reason for any of the variations not happening in the sequence of creation, nor is there any special scientific arguments in their favor except the anthropic (weak and strong) principles indicating that they all happened because the net result of it was predetermined. However, if any of these changes or deviations ever happened, we would have been in a lifeless universe and probably nothing could have evolved at all from some of those variations.

All these factors are explained to be a coincidence of natural evolutionary process. But it remains to be explained as to how such a coincidence ever came to materialize without any predetermined chain of sequences. The product of very specific and unique evolutionary process, created human beings from the ultimate nothingness of a total symmetry. It is only because we exist as part of the creation sequence that we can observe whatever happened and the role of an observer is essential to this creation. We can not logically or scientifically prove or explain the reason for their happening except by a predetermined guidance, Guidance from an active and living Creator or God.

Evidence of Purpose in Creation:

To understand the complexity of Nature and all of creation we have in our scientific adventure spent so many generations. And the recent times have brought with it an explosion of Knowledge and progress. The Milky Way has our sun as one of its hundred billion stars, each of which has its own "solar (star)" system, with or without planets of its own. It will require nearly ten thousand years only to glance through each of their records taking a second at a time. Our universe is now known to have more than a hundred billion galaxies similar to our own Milky Way galaxy. Living in such a complex structure makes it an impossibility to know everything that goes on within it.

Physician Lewis Thomas observes that the greatest of our Accomplishments this century has been to discover our own Ignorance⁵⁶ (**Coming of Age in the Milky Way** - T.Ferris, William Morrow, New York, 1988).

In the sphere of evolution of life, we have been able to summarize the appearance of the first microorganism, followed by *eukaryotic* cells (about 1.5 billion years ago), with a nucleus for inheritance and *mitochondria*. The unicellular plants such as algae and fungi appeared about 800million years ago; it was followed by the appearance of multicellular organisms like the green algae, and then primitive sea-weeds and fungi followed about 200million years later. The soft-shelled aquatics appeared only 570million years ago, followed by the hard-shelled animals, 70million years later. The land organisms came about 400million years ago, with the land-based plants. The symbiosis between the anaerobic (living without oxygen) with aerobic (living with oxygen) organisms, resulted in the appearance of spider like animals (390million years), corals, sponges, earthworms, insects, mollusks, star fish, sea urchins and such other animal life. Following a tortuous path of evolution and/or revolution, the largest animal ever to inhabit the globe, the dinosaurs, appeared much later. Then about 65million years ago suddenly they all disappeared. It was possibly due to bombardment of earth by a large comet, which raised enough dust to cover the sun rays long enough to create a cold desolation, in which

photosynthetic productions were nearly eliminated, and the climate with its food scarcity killed the huge animals which still survived the initial catastrophe. This opened up the path for development of warm-blooded animals including us. The hominids were followed by the *Homo erectus*, then *Homo Neanderthals*, but our generation probably only took over only about 25,000 years back.

L. J. Henderson in his book, "**The Fitness of the Environment**" observes that the uniqueness of the carbon atoms as the chemical basis for life points to the fact that the properties of matter are what they are, only by following the design of formation of carbon itself. This requires a very delicate energy balance, called resonance, of three helium nucleus to fuse together within the stars, creating the carbon. Fred Hoyle states, "Some super-calculating intellect must have designed the properties of the carbon atom, otherwise the chance of my finding such an atom through the blind forces of nature would be utterly miniscule"⁵⁷ (*The Universe, Past and Present Reflections* - Fred Hoyle, *Engineering and Science*, November 1981). G. G. Simpson observes, "Man did originate after a tremendously long sequence of events in which both chance and evolution played a part The result is the most highly endowed organization of matter that has yet appeared on earth - and we certainly have no good reason to believe there is any higher in the universe. To think that this result is insignificant would be unworthy of that high endowment"⁵⁸ (**The Meaning of Evolution** - George Gaylord Simpson, Mentor Edition, New York, 1951). The probability of forming a two thousand atom protein molecule (the building blocks of animals) in nature has been calculated as one in 10^{321} or in other words an impossibility, requiring an infinitely longer time than the estimated age or duration of the earth's own existence⁵⁹ (**Human Destiny** - Lecomte du Nouy, New York, 1947). The argument of Milton Munitz is that, for a Transcendence beyond time and space should not be seen just as an extra cosmic existence of the Creator, but should show His presence within His Creation Itself⁶⁰ (**Cosmic Understanding: Philosophy and Science of The Universe** - Milton K.Munitz, Princeton, 1986). The exact modality of creation by the Creator within it or without, is not spelled out

in any of the religious texts, more than what is required for our guidance within this life. A complete understanding may not be required until the time we go back to Him. Our knowledge and understanding of scientific facts should suffice for a meaningful guidance. The Holy Quran states, "Allah! There is no God but He - the Living, The Self-subsisting, Eternal. No slumber can seize Him nor sleep. His are all things in the heavens and earth. Who is there can intercede in His presence except as He permiteth? He knoweth what (appeareth to His Creatures as) Before or After or Behind them. Nor shall they compass aught of His knowledge except as He willeth. His Throne doth extend over the heavens and the earth, and He feeleth no fatigue in guarding and preserving them for He is the Most High, the Supreme (in glory)" (Chapter 2:verse 255; see also 3:26; 59:22; 64:1).

All these instances of the evolutionary (or revolutionary) sequences of a natural selection or a cosmic evolution, following our appearance on earth, brings with it the impossible statistical probability in every stage of the process. A Guidance and/or a predetermined sequence is essential for this to happen, making Nature itself a manifestation of the Creator. In recent times many eminent personalities including scientists of eminence have given their support for such a conclusion⁶¹ (**Evidence of Purpose: Scientists Discover the Creator** - Edited by John Marks Templeton, Continuum, New York, 1994).

Miracle of Nature:

Miracle is defined as a supernatural event or happening regarded as an act of God. Anything, which we can not comprehend through the laws of physics, should come to us as a miracle. Even the natural phenomenon which were not understood by us previously, but is now explained by our expanded knowledge in laws of physics, would now appear to be a case of miracle explained or solved. As a matter of many of the intricate natural processes, which we now understand, fall in this last category. Water achieves its maximum density at four degrees Celsius, thus allowing the lighter frozen ice to float, thus allowing all the live creatures to survive and thrive, beneath the frozen ice sheet. Energy from the sun sustains all life

here on earth, through the heat and light that comes to us. This tremendous amount of energy is released through the process of fusion, when four hydrogen atoms are fused to give a molecule of helium and the difference in the weight of the four atoms of hydrogen and the helium is converted to energy. We have now been able to experimentally achieve this here on earth by creating the hydrogen bomb. An atomic bomb utilizes the process of fission, in which the reaction established through radioactive decay from uranium or plutonium to more stable element releases the energy of the atomic bomb, from the resultant mass difference of the products. This is expedited through setting up conditions for a chain reaction, to develop the bomb. When the atom bomb is used as the triggering mechanism, for converting isotopes of hydrogen to helium, we get the hydrogen bomb (energy released from the mass difference of the products). So far a controlled fusion reaction has been eluding us, even though many claims have been made for it in various ways. Recently however an experiment in a device called the Z-machine, a new way has been found to trigger controlled fusion reaction with immense nanosecond (10^{-9} sec.) bursts of X-rays. This eventually may bring in a way for the controlled fusion⁶². (Fusion and the Z pinch - Gerald Yones, *Scientific American*, August, 1998).

Thus the very basic process of our earthly existence is well explained, but we can still call it a miracle of Nature. And Nature has many such marvels in its store for us to wonder, appreciate and revel, at the awe inspiring significance of a Creator Who manifests Himself through it all. We have seen that everything, not only light, have a dual existence both as "particle" and "wave" forms. This has been clearly demonstrated in the case of photons, electrons and other particles as described earlier on. The bigger the particle size the larger will be the wave length configuration, and for a human being it will have to be measured in cosmic magnitude, rather than an earthly dimension. This fact, and the knowledge that time stands still at the speed of light, and that space can expand or contract spontaneously at speed far exceeding that of light, as seen during the inflationary period of cosmic creation are all very enlightening. We have also seen that

communication between two objects not physically or biologically connected, and each of them separated to cosmic distances, can take place spontaneously, as explained in the case of quantum ghost theory. Time travel to "future" and "past" events are still in the realm of science fiction, just the same as space travel, landing on the moon and bringing back a portion of it back home on earth were, only a few decades ago. Actually, much of what we are taking for granted today including television, atomic powered submarines and space ships and many others were unthinkable even earlier in this century. All these facts, makes it easy to comprehend "*Miraj*" (or Ascension), an extraterrestrial travel of prophet Muhammad (SM), not only as a spiritual but also as a material travel on the basis of a scientific conception. God is giving us the knowledge of many things and future developments can solve more of these miracles. Having been created with an inquisitive mind to ensure realization of the meaning of all of the creation - more answers may yet come to us through our investigations as and when appropriate. All that is yet to come is entrenched in the space-time web of creation as designed by the Creator Himself.

Creation implies role of a Creator, whatever and however we may visualize the cosmos to be. Even if the universe is completely self contained, with no singularities or boundaries, and is completely described by a "Unified Theory" - the role of the Creator has still to be perceived in key factors governing the laws of physics, mathematics and all the other laws of Nature, together with the natural constants, allowing the evolution and the creation of the universe as it is and with us forming an integral part of it, playing a vital role in the chain of creation. The quantum physics of cosmology is still at its infancy, and may explain some of the things we would like to understand. Outstanding genius like Einstein did not believe in the "expanding" universe, but later accepted his stand was a mistake. He never could fully accept the Heissenberg's theory of uncertainty during his lifetime; and now this has become the foundation stone for all our developments of the last decades. His genius was not degraded by such challenges, but actually helped in the solutions of many others. We are still looking for an elegant mathematical solution to the moment of creation and

the string theory, which postulates infinitesimal loops resembling a vibrating string, to replace all the point like particles and propagate many more dimensions, which can only materialize in a mathematician's dream. A combination of five such independent theories, combined into one "M-theory" with eleven dimensions has been proposed. But even this projection is without any mathematical or experimental solution!⁶³ (Unfinished Symphony - J.Madeleine Nash, *Time*, December 31, 1999). Development of intelligence and the genius of human beings with which we are nurtured, who like to know the ultimate of everything and have questions behind questions, can only be answered by accepting a Creator guiding His creations and "Nature" as we see them today, being His Own manifestation.

The most oft repeated verses, forming the first chapter of the book (Surah Fatiha), without which none of the prayers for a Muslim is complete, states, "In the name of God, Most Gracious, Most Merciful. Praise be to God, the Cherisher and Sustainer of the Worlds; Most Gracious, Most Merciful. Master of the Day of Judgment. Thee do we worship, and Thine aid we seek. Show us the straight way. The way of those on whom Thou hast bestowed Thy Grace, Those whose (portion) is not wrath (anger), who go not astray." Amen! (Chapter 1, verses 1-7).

APPENDIX

Scientists of Golden Age of Islam with some selected publications and subjects

1. DifaFarul Sofi Jabir Ibn Hayyan (702-765 A.D) - **Kitab an-Nabat, Kitab al-Fillah, Kitab al-Sabin, Kitab al-Miza, As-Somum Waddafa Madarriha** (total fifty books) - Chemistry and Alchemy.
2. Ali Ibn Rabban Al-Tabari (d.850 A.D) - **Firdausal Hikmah** (Paradise of Wisdom) - Medicine.
3. Abu Musa Jafar Muhammad Ibn Musa Al-Khawarizmi (780-870 A.D) - **Hisab al-Jabar Wal Muqablah** - Algebra, Geography and Astronomy.
4. Hunain Ibn Ishaq (810-870 A.D) - **Al-Ashar Moqalat fi al-Ain** - Pharmacy.
5. Abu Yousuf Yaqub Ibn Ishaq Al-Kindi (800-873/4 A.D) - **Fil Jawahir Wal Asbah (Book of Rays)** - Astronomy, Mathematics, Medicine, Geography, Psychology and Music.
6. Abdullah Ibn Khordadbeh (c.844 A.D) - Geography and Astronomy.
7. Muhammad Ibn Kathir Al-Farghani (800-870 A.D) - Astronomy.
8. Muhammad Ibn Jabir Al-Battani (800-870 A.D) - Astronomy.
9. Yahya Ibn Masawahy (800-870 A.D) - Pharmacy.
10. Al-Jawahari (c.830 A.D) - Mathematics.
11. Abu Hanifah Ahmed Ibn Daud Al-Dinawari (815/25-895 A.D) - **Kitab al-Nabat (six volumes)** - Biology and Botany.
12. Ibn Firnas (d.888 A.D) - Engineering (invented flying devices).
13. Sarakhi Ahmed Muhammad Ibn Al-Tayyaib (d.889 A.D) - Geography.
14. Al-Baladhuri (d.892 A.D) - Geography.
15. Yaqubi Al-Abbasi (d.897 A.D) - Geography.
16. Abu Djaafaar Mohammad (Banu Musa brothers,d.837 A.D)- Astronomy.
17. Abu Kasim Ahmed (Banu Musa broth., 9th.cent.)- Music, Mathematics.
18. Al-Hasan bin Musa Shaker (Banu Musa brothers,c.9th.century)- Music and Engineering (invented automatic hydraulic organ).
19. Samad b.Ali (c.9th.century) - Physics.
20. Thabit Ibn Qurra (836-901 A.D) - Mathematics.
21. Abu Zaid Ahmed Ibn Sahl Al-Balkhi (840-934 A.D) - Geography.
22. Abu Bakar Muhammad Ibn Zakariyya Al-Razi (Rhazes;841-923 A.D)

**Kitab fi-Hayat al-Ain, Kaifiat al-Absar, Al-Mansure, Al-Hawiconinene
Kitab al-Asrar, Maqala fi Ilaj al-Ain bil Hadid** (total of over two hundred books) - Chemistry, Medicine and Minerology.

23. Ali Ibn Washi Ya Al-Nabati (830-935 A.D) - **Kitab ul-Ususi al-Kabir** - Alchemy and Medicine.
24. Ali Ibn Essa (Hally Jesu; c.10th.century) - **Tadkhirat al-Kahhalin** - Astronomy and Medicine.
25. Abdul Abbas Al Fadl Hatim Al-Nayrizi (897-922 A.D) - **Al-Kitab fi al-Ustarlab** - Astronomy and Medicine.
26. Ahmad b.Fadlan b.Abbas b.Rashid b. Hamad Ibn Fadlan Al-Battani (c.920A.D) - Astronomy, Geography and Botany.
27. Al-Qass (c.950 A.D) - Mathematics.
28. Ibrahim b. Mohd.Al-Farisi Al-Istakhri (c.950 A.D) - Geography.
29. Abul Hasan Ali b.Hussain Al-Masudi (915-966 A.D) - Geography.
30. Abu Kamil Al-Shuja (d.955 A.D) - Medicine.
31. Al-Farabi (d.951 A.D) - Mathematics.
32. Ali Ibn Al-Abbas Al-Majusi (Haly Abbas; d.994 A.D) - **Kamil al Sana's Kitab ul Hikmat Al-Malki** - Medicine.
33. Al-Yaqubi (d.994 A.D) - Geography and History.
34. Abu Abdallah Al-Khwarizmi (d.997 A.D) - Astronomy.
35. Ikhwan Al-Safa (c.10th.century) - Rasail Ikhwan al-Safa - Mechanics.
36. Abu Abdullah Md. Bin Ahmed Ibn Said Al-Tamari Al-Maqdisi(d.990 A.D) - **Ahsan al-Taqsim fi-Marifat fi al-Tarikh, Al-Murshid** - Medicine and Geography.
37. Abu Md. Al-Hasan b. Yaqub Al-Hamdani b. Al-Haik (c.985 A.D) - Astronomy and Geography.
38. Ayub Bin Ayun (c.10th.century) - **Fi Amrad al-Ain wa Mudawathio** - Ophthalmology and Alchemy.
39. Hudud Al-Alam (c.985 A.D) - **Kitab Ul-abnia Un Haaq Ul-Abdia** - Astronomy and Geography.
40. Muhallabi (c.985 A.D) - Astronomy and Geography.
41. Abu Mansur Muwaffiq (Harawi, c.957 A.D) -- Chemistry and Medicine.
42. Abdul Rahman Al-Sufi Ahmed Al-Sughain (c.980 A.D) - Astronomy.
43. Ibn Umayal (c.10th.century) - **Kitab al-Maal Waraqi Wal-Ard al-Najmiyyah** - Alchemy.
44. Abul Wafa (10th.century) - Astronomy.

45. Ishaq Ibn Sulaiman (880-932 A.D) - Published a **Guide for the Physician** - Medicine.
46. Kamal Al-Din Al-Farisi (c.10th.century) - **Tanqih al-Manazir** - Medicine.
47. Nastas b. Jurai (d.971 A.D) - Medicine, Physician.
48. Ibn Yunus (d.1009 A.D) - Astronomy and Physics.
49. Ibn Al-Jazzar (920-1009 A.D) - **Zad al-Musafir, Siyasat al-Sibyan Wa Tadbirihum** - Medicine.
50. Ishaq b. Husaib Al-Munajjim (951-1063 A.D) - Geography.
51. Abu Ali Al-Hasa Ibn Al-Haitham (Al-Hazen; 965-1039 A.D) - **Risala fil Azhal, Risalah fi-Khawass al-Muthallatah min Jihath al-Umud, Kitab ul-Manzir (Opus Majus)** - Astronomy, Astrology, Biology, Mathematics and Physics.
52. Abu Raihan Muhammad b. Ahmad Al-Biruni Al-Khwaizmi (Al-Biruni; 973-1051 A.D) - **Kitab ul-Hind, Kitab al-Saydana fil Tibb, Kitab al-Jamah fi-Marifah, Al-Jawahir, Tahdid, Qanun-i-Masudi, Athar al-Baqiya** - Astronomy, Biology, Geography and Pharmacy.
53. Abul Ali Al-Hussain Ibn Abdullah Ibn Sina (Avicenna, Bu Ali Sina; 937/980-1037 A.D) - **Al-Qanun, Kitab al-Shifa al-Tabiyat, Al-Ishrat Wa al-Tanbihat, Al-Najat** - Astronomy, Biology, Geology, Mathematics and Medicine.
54. Al-Muziz Ibn Budis (1015-1061 A.D) - **Umdat al-kuttab Wa Uddat Dhawil Albab** - Chemistry (Paper making).
55. Abu Sahl Isa Ibn Yahya Al-Mashihi Al-Jurjani (d.1002/9 A.D) - **Mast-o-Masthee, Kitabal Miafil Tibb** - Medicine.
56. Khalifa Ibn Abi Al-Mahasin (C.11th.century) - **Al-Khafi fi al-Ihul** - Medicine and Ophthalmology.
57. Ahmed Al-Qaisi (c.11th.century) - **Kitab Natijat al-Faikar fi-Ilaj, Amrad al-Basara** - Medicine and Ophthalmology.
58. Bahanyar Ibn Al-Marzuban (d.1066 A.D) - **Al-Tahsil** - Physics.
59. Abu Ubaid Abdullah b. Abdul Aziz Al-Bakri (1040-94 A.D)- Geography.
60. Ibn Malka Al Baghdadi (1062-1152 A.D) - **Almutabar fi al-Humah** - Physics (Mechanics).
61. Abu Al-Fath Umar Ibn Al-Khayyam (1033-1123 A.D) - Astronomy, Pharmacy and Poetry.
62. Abu Abdullah Muhammad b. Abdur Rahim Al-Mazimi (1080-1169 A.D)- Geography.
63. Ibn Al-Lais (c.10/11th.century) - Mathematics.
64. Al-Khujandi (c.10/11th.century) - Mathematics.

65. Abdul Hakim Muhammad Al-Kathi (c.11th.century) - **Aynal Sanah Wa Awn al-Sanaa** -Alchemy.
66. Al-Karkhi (c.11th.century) - **Al-Kafi fil Hisab, Al-Fakhri** - Mathematics.
67. Syed Ismail Al-Jurjani (c.11th. century) - **Zakhira-i-Khwarazmshahi**-Medicine.
68. Abu Moslamah Al-Majriti (c.11th.century) - **Rubatal Hakim, Ghayatal Hakim** - Alchemy.
69. Abul Qasim Al-Zahrawi (Albucasis; Ali Zohravia, 1013-1106 A.D)- **Al-Tasn** (formed the basis of many European studies) - Medicine.
70. Abd Al-Malek Ibn Zohr (Avenzoar; Abhomeron; 1091-1162 A.D) - **Kitab al-Taysir fi al-Madawah Wal Tadbir** - Medicine and Pharmacy.
71. Abd Al-Rahman Al-Manzur Al-Khazini (d.1121 A.D) - **Kitab Mizan al-Hikma** - Physics (Mechanics).
72. Muhammad b. Abu Bakr Az-Zuhri (c.11th.centuri) - Geography.
73. Ali Ibn Ridhwan (Hally Rodoam, c.11th.century) - **Al-Tatarruq bil Tibb, Daf Madar** - Medicine.
74. Ibn Giazla (Bingesia, c.11th.century) - Medicine.
75. Abdullah Muhammad b.Idrisi(Al-Qurtabi,1100-1164 A.D)-Geography
76. Al-Bitruni (c.12th.century) - Mathematics.
77. Abul Md. Ibn Ahmad Ibn Zubair (1115-1217 A.D) - Geography.
78. Ibn Al-Baytar (1190-1248 A.D) - **Kitab al-Mughnai, Kitab al-Jami** - Botany, Medicine and Veterinary.
79. Abu Nasr b.Adnan Ibn Al-Ayn Zarbi (d.1153 A.D) - **FI Marad al-Shifah, Al-Kafi fi Sana al-Tibb** - Astrology, Medicine and Physician.
80. Ibn Fadlan (c.12th.century) - Geography and History.
81. Ibn Hassan (c.12th. century) - Astronomy.
82. Abu Imran Musa Ibn Maimun (Maimonides, d.1251 A.D) - Wrote **Treatise of Poisons** - Medicine.
83. Abu al-Wahid Md. Ibn Ahmed Ibn Rushd (Ibn Rustah; Averroes; 1126-1198 A.D) - **Kitab al-Kolliyat fil Tibb and also the Grand Commentary** - Astronomy, Geography and Medicine.
84. Qasar Ibn Abi-I-Qasim Ibn Abd al-Ghani Ibn Musafir Alam Al-Ghafiqi (d.1251 A.D) - **Maqalat fil Ain** - Astronomy, Biology, Botany, Engineering.
85. Abu Ismail al-Hussein Ibn Ali Ibn Muhammad (c.12th.century) - **Kitab al-Jauhar al-Nadir fi Sanaat al-Iksir Jami al-Asrar Wa Tarakib al-Anwar, Mafatib al-Rahman wa Masabih al-Hikma, Haqaiq al-Ishtihad fil Kimiya** - Alchemy.

86. Al-Bakria (c.12th.century) - Medicine.
87. Fakhr Ali Din Al-Razi (1150-1209/10 A.D) - **Al-Mabahith Al-Mashriquiyyah** - Physics (mechanics).
88. Abul Qasim Ammar Ibn Ali al-Mawsili (c.12th.century) - **Kitab al-Muntakhab-bi-ilaj al-Ain** - Medicine.
89. Jabir Ibn Aflah (c.12th.century) - **Islam al-Mijisti** - Astronomy.
90. Mahmud b.Shan Shah al-Ayubi Abul Fida (b.1273 A.D) -Geography.
91. Ibn Said (d.1247 A.D) - Geography.
92. Alauddin Ibn Al-Nafis (d.1288 A.D) - Medicine.
93. Ibn Jumay (c.12th.century) - Alchemy.
94. Salah al-Din Ibn Yusuf(c.12th.century) - **Nur al-Uyun** - Medicine.
95. Ibn al-Alam (c.12th.century) - Astronomy.
96. Ibn Al-Wafid (Abenguefi,c.12th.century) - Medicine.
97. Abu Dawood Sulaiman b.Hassa Ibn Golgol (Ibn Juljul,c.12th.century) - **Tabaquat al-Atibba wal Hukma** - Medicine.
98. Mohammad b.Mahmud Abu Yahya al-Qazwini (b.1203 A.D)-Geography.
99. Ibn abi-Usaibiah (c.13th.century) - **Uyun al-Anba fi Tabaqatal Atibba, Tarikh al-Hukamah** - Pharmacy.
100. Ibn Abdullah ar-Rumi Yaqut Hamavi Nasiruddin al-Tusi Almuhaq-qiq, 1201-1274 A.D) - **Al-Zij al-Ilkhani Tadkhirah al-Haiah, Al-Kitab al-Masum bi Sarhai Al-Isharat** - Astronomy, Geography, Mathematics.
101. Abu Yahya al-Qazuini (Najm Al-Din Al-Kitabi, 1203-1283 A.D) - **Al-Mufassa fi Sharh Al-Muhassal, Kitab al-Umdah** - Medicine, Physics.
102. Abu Muhammad Al-Abdari (c.1290 A.D) - Geography.
103. Muhyiail-din al-Maghribi (1260/65 A.D) - Mathematics.
104. Al-Samarqandi (c.1270 A.D) - Mathematics.
105. Abdullah Ibn Ali Al-Kashani (c.13th.century) - **Kitab Jawahir al-Arais wa Ataib al-Nafa** - Chemistry and Ceramic Glazing.
106. Abd al-Rahman Ibn Khaldun Al-Akfani (1332-1406 A.D) - **Muqaddimah, Kitab al-ibar** - Alchemy, History, Sociology.

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	Quotations from the Holy Quran (Chapter:Verse) , numbered in order of their appearance:	
i.	The eternal goal for our soul 57:20	5
ii.	God's sign in the Universe 29:20	8
iii.	The spontaneous creation 2:117 ...	11
iv.	Scenario of creation 41:9-21;7:54;70:4; 32:5 ...	20
v.	The end scenario 21:104; 10:4; 27:64; 29:19-20; 30:11-27; 32:10	23
vi.	Life on earth 11:7; 21:30; 24:45; 25:54; 6:2; 15:26,29	28
vii.	Man on earth 2:30, 35, 36, 38; 30:54	30
viii.	Jinns 15:27	31
ix.	The straight path 46:29-30	31
x.	Angels 35:1	31
xi.	Soul and Spirit 15:29; 17:85	33
xii.	Day of reality 78:38-40	34
xiii.	Aim of life 2:286	36
xiv.	Return from earthly life 10:4	36
xv.	New creation 27:64; 29:19-20; 21:104; 35:16-17	36
xvi.	Creation Periods 70:4; 32:5; 64:9; 39:5; 22:47	37
xvii.	Just Ends 45:22	37
xviii.	Fate or Destiny 17:13-16	40
xix.	The human observer 51:56-58; 2:30	43
xx.	The Guidance 29:88; 92:12-13	43
xxi.	The Light 4:174; 24:35	45
xxii.	Purpose of man's creation 21:16-20	47
xxiii.	Generations after the Flood 10:71-73	48
xxiv.	The Flood 23:27 ...	48
xxv.	Prophets for all communities 16:36; 2:106; 4:152; 3:19	49
xxvi.	The completion of religion 5:3; 33:40	49

xxvii.	Books of Faith 5:69; 2:213	50
xxviii.	Protection of the Quran 85:21-22	50
xxix.	Brotherhood of Man 23:52	50
xxx.	The importance of knowledge 96:1-5	52
xxxi.	The immortal soul 89:27-30	57
xxxii.	The Book of Guidance 2:4-5	59
xxxiii.	Islam is a favour for us all 49:17	59
xxxiv.	Message of the Books revealed 21:105	60
xxxv.	Just returns for the soul 16:111	61
xxxvi.	The Goal of Hereafter 42:20; 11:15-16	62
xxxvii.	Incline fo peace 8:61; 36:58	62
xxxviii.	Fulfilment of our Goal 22:40; 28:61; 45:22	63
xxxix.	Prayer for knowledge 20:114	63
xL.	Creator and His Creations 2:255; 3:26; 59:22; 64:1 ...	70
xLi.	In the Praise of God (Surah Fateha) 1:1-7	73

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Summary of "Beyond Faith and Science"

Science is the pursuit of understanding and discovering the mysteries of nature; and technology utilises this knowledge for our worldly benefits. When we say all living beings are created by God - a scientist tries to discover the natural truth behind the complexity of its creation, propagation and survival. Faith on the other hand accepts all that as the creation by Creator Himself. An established natural process thus reveals itself as a miracle of creation and Nature itself becomes the manifestation of Creator and we discover the Design in the Might and Benevolence of all that we see and perceive with our senses. Beyond Faith and Science traces our cosmic creation from the point zero, bringing out the known scientific facts and arguments behind all of creation; and tries to discover the purpose of placing the genius of human intelligence as an observer to make it all possible in the design of God's Creation.