In the name of Allah, the Compassionate, the Merciful

CHAPTER 1

DIVINE GUIDENCE ON SCIENCE
The Qur'an provides broader guidelines about a number of scientific facts and various phenomenons that take place in the universe. One important line of demarcation between the divine guidance about the natural phenomenon and the scientific laws and theories that is to be appreciated is that divine laws, facts and phenomenon and values are eternal and infallible while as scientific laws and theories are subject to change, modification and are even contestable. Physical sciences are not infallible and that scientific axioms are not necessarily the last word on the subject. There can be no such thing as an absolute scientific truth. Something that was universally accepted in the past as scientifically correct might not be accepted today in the light of latter day scientific experimentation and discoveries. Similarly, what is acceptable today in the world of science might be disputed and disproved in course of time. This does not, however, mean that no heed should be paid to purely science and scientific research or this does not mean that scientific research should be considered as an exercise in futility. Science is not divine revelation but it may serve as a means for betterment of mankind and may help to develop a better understanding of Allah's creation and its purpose.¹

Science is that systematic knowledge of nature and physical world, which is based on observation, experimentation and measurement. These is the meaning of science accepted and

described by scientists. No other explanation of science is acceptable to them that could lead to explore the scientific knowledge.\(^2\)

Generally, we find rational arguments in the *Qur'an*, these too on common sense level. The *Qur'an* does not generally favour the attitude of showing by demonstration. However, at two places the importance and significance of experimentation is not only implicit but actual experiment has been set up as described in the Holy text. Once as given in *Al Baqarah*\(^3\) a man was kept dead for hundred years in response to his question. During this period his donkey also died, degenerated and decayed and only its bones remained un-decayed. But his water and food were kept preserved. When he breathed again after hundred years, his donkey was given flesh and skin before his eyes. The man thus witnessed one of the attributes of Allah (S.W.T) that He can infuse life in dead bodies according to His Will in an extraordinary manner. Another event is related to the prophet Ibrahim (A.S.)\(^4\) who requested Allah to show how the dead ones will regain life. An experiment with four birds was suggested to the prophet but before that he was asked, “if he believe not”. The prophet Ibrahim (A.S.) aptly responded, “of course I believe but it is for a bit of satisfaction of his own understanding”\(^5\). The conversation


\(^3\) *Al Qur'an*, 2:259.

\(^4\) *Alayh Al Salam* means peace be upon the Prophet Ibrahim.

\(^5\) *Al Qur'an*, 2:260.
at this occasion points to the fact that Allah (S.W.T) does not like the attitude of making unnecessarily observations and experimentation in the matters of the unseen world. On the other hand, it also becomes explicit that in addition to Īmān⁶ and Āqīl⁷ the observation and experimentation is also a significant source of satisfaction. And these are the occasions when man is open to the danger of limiting the domains of knowledge to the material and sensual world. The scientists reject supernatural sources and methods of knowledge and develop a unique methodology for science and limit the concept of the entire world into the narrow confines. The reality thus sometimes skips from their vision because the method which they believe in does not always hold good. Contrary to this, the Qur'ān first tells about the reality and then provides evidences of the reality from the very world around man.⁸

The Qur'ān clearly looks supporting all positive aspects of scientific method as such it invites to ponder upon, study and try to understand the world and find its secrets, yet it explicitly tells many secrets beforehand. Then it guides the humanity that if man gives sound thought to the world there can be no reasonable ground for

⁶The conviction or certainty that Allah is indeed the one and only God and that Muhammad (Salla Allahu 'Alayhi wa Sallam) is His last prophet.
⁷Reason or collectively the faculties through which 'ilm (knowledge) is achieved.
⁸Abdul Ali and Sayyid Ahsan, op.cit., p. 10-11.
rejecting the revealed Truth. \(^9\) Almost all vital aspects of science are mentioned in the Qur'an.

The Hadith of the Holy Prophet Muhammad (S.A.W.S) are spread through 200 books and over the years Islamic scholars have tried to collect the Hadith exclusively dealing with disease and treatment separately. This has resulted in separate chapter Kitab Al-tibbi\(^10\) in books on Hadith. The Prophet Muhammad (S.A.W.S) has encouraged the spirit of investigation and analysis of facts. A careful examination of Ahadith of the Prophet Muhammad (S.A.W.S) reveals treasures of information. It can be safely accepted that the Prophet (S.A.W.S) had a tremendous knowledge of the science. Many of the methods used by the Prophet (S.A.W.S) find use in different branches of science of the world, thereby indicating the knowledge of the Prophet (S.A.W.S).

Now let us attempt to explore some important concepts of science under the divine guidance provided by the holy Qur'an and Ahadith of the Prophet Muhammad (S.A.W.S):

\(^9\)Ibid., p. 12.

\(^10\)Kitab Al-tib means book of medicine.
2.1 The Universe

The creation of the universe is a subject that is given detailed treatment in the Qur'an. The Qur'an is replete with the verses that provide divine guidance about almost every stage and aspect of the creation and this fact continues to astound scientists today because of its very accurate agreement with 21st century knowledge.

All the evidences available today suggest an explosive origin to the universe that brought both space and time into existence. This is what is referred to as the Big Bang.11 The theory of the Big Bang which has successfully taken over the place of the “Steady state theory”12 was worked out in the 1920's by two scientists quite independently of each other. One was the Russian meteorologist

11Big Bang Theory is currently accepted explanation of the beginning of the universe. The big bang theory proposes that the universe was once extremely compact, dense, and hot. Some original event, a cosmic explosion called the big bang, occurred about 10 billion to 20 billion years ago, and the universe has since been expanding and cooling.

12The steady-state theory holds that the universe looks; on the whole, the same at all times and places. The Austrian-British astronomer Hermann Bondi and the Austrian-American astronomer Thomas Gold formulated the theory in 1948.
Alexksandr Friedmann and the other Belgian Mathematician Georges Lemaitre. The Big Bang itself resulted from an extremely dense singularity. The theory of the creation of the universe is one of matter, space and time that are intimately linked together. Matter and space were joined as one and then were separated in the explosion. This is very accurately described in the Qur'an:

 позвайте, кем же была замикающаяся земля, когда вы были один? 

“Have not the disbelievers pondered that the heavens and the earth were of one piece, then We separated them and that We made of water every living thing? Will they not then believe?”

The subsequent history of the Big Bang indicates that the whole event took place at a very high temperature; it was a hot Big Bang. For every phenomenon, however the scientists believe in the cause and effect. In case of Big Bang theory, surprisingly they fail to address the issue of cause responsible for the Big Bang. This leaves a big question mark on their assertion. This view has been confirmed by the later discovery of the background microwave radiation. The eventual formation of galaxies resulted as a condensation, under gravitational pull, of hot gases which was

---

mainly Hydrogen, but may also have contained Helium and a few other light elements as well. Over the ages, and with the formation of galaxies, the gas has gradually condensed into individual stars.\textsuperscript{15} The universe in its very early stages was, thus, still in the form of hot gases which is mentioned in the Qur'an in the following verse:

\begin{quote}

tَمَّ الْأَسْتَوَى إِلَى السَّمَاءِ وَهُوَ ذَخَانٌ ... (سُورَة فَصِّلَت)
\end{quote}

"Then He turned to the sky, which was smoke..."\textsuperscript{16}

Once these stars were formed a system had to be devised to govern their motion. The kinetic energy stored in the forward movement of these bodies could not be relied upon on its own, otherwise stars and also planets would have shot off in straight lines dispersing into space. No planet would ever revolve around its mother star, which also applies to earth and, thus, life would not have evolved on earth, because the whole of life on earth is so dependent on the sun.

The gravity is the brilliant divinely created force, working as an equating factor to the centrifugal force to induce precise orbits for all heavenly bodies. The speed, mass and distance of two bodies

\textsuperscript{15} Microsoft Encarta Reference Library, op.cit., s.v. "stars"

\textsuperscript{16} \textit{Al-Qur'an}, 41:11. Here the verse did not say clouds or gas, but smoke, which is a very accurate description as smoke is hot gas, whilst clouds are cold.
have to be worked out very precisely to develop the perception of an orbit.¹⁷

A tennis ball thrown upwards towards the sky travels upwards as a result of the kinetic energy stored in the throw but, eventually, the gravity of the earth overcomes it and the ball falls back to the ground. But, the ball thrown at a very high speed (say 10km per second), escapes the gravity of the earth and leaves the earth altogether. This is what is known as the Escape Velocity. It is the speed required for a moving body to enable it to escape the gravity of a planet or star.¹⁸

When an artificial satellite is placed in orbit around the earth, what happens is that at a required distance, while the satellite is shooting out of the earth's gravitational field, its speed is reduced which reduces its kinetic energy and with some directional adjustments its kinetic energy is equated with the earth's gravity.¹⁹ All these adjustments are very precisely executed at a precise distance and speed otherwise it can not find its desired orbit. When one looks at the endless intricate orbits and mathematical precision in the universe one can only gasp in. All the planets revolve around stars, which in turn revolve round the centre of gravity of their own


galaxies. These very accurate balances are mentioned in the following verses:

الشمس والقمر يحسبان

«The sun and the moon are bound by a schedule.»

والأسماء رفعتها ووضع الميزان

He elevated the sky and set up the balance.»

The orbits of the heavenly bodies are mentioned in the verse:

والأسماء والقمر كل في فلك يسبحون

«...and the sun and the moon, each one is floating in (its own) orbit.»

In the next stage these massive newly formed stars start to shrink under their own gravitational pull. As a result, their central regions become denser and, thus, hot. When the material in the centre of the star has heated up sufficiently, to be exact, at least seven million degrees Kelvin, nuclear reactions begin. These

20 Al- Qur'an, 55:5
21 Al- Qur'an, 55:7
22 Here the word "كل" i.e. "each one" indicates that the reference to the sun and the moon is symbolic and it applies to all other heavenly bodies also.
23 Al- Qur'an, 21:33.
24 The SI unit of absolute temperature, equal to 1/273.16 of the absolute temperature of the triple point of water, equivalent to one degree Celsius. A temperature in kelvin may be converted to Celsius by subtracting 273.16.
reactions, which are similar to those which take place in a hydrogen
bomb, continue throughout the life of the star. These reactions are
distinctly different from ordinary combustion (as in burning wood).
What actually takes place inside a star is that hydrogen is converted
to helium with the emission of huge energy.\textsuperscript{25} The \textit{Qur'an} precisely
refers to it as:

\begin{quote}
الله نور السماوات والأرض مثلكَ نوره كناركة فيها مصابح يضاء في زجاجة الرَّجاحة
كأنها كوكب ذري يوفد من شجرة مباركة زيتونة لا شرقي ولا غربي بكاء زينتها نضيء
وَلَا نَخْلَى تُعَمِّسَنَّ ... (سورة البور)
\end{quote}

Allah is the light of the heavens and the earth. The example of His light
is as a niche wherein is a lamp. The lamp is in a glass, the glass is as it
were a shining star. It is lit from a blessed tree, an olive, neither of the
east nor of the west, whose oil would almost glow forth though no fire
touched it...\textsuperscript{26}

A part of this verse mentions a star, its fuel, and a reaction
which is not combustion (fire) but a sort of "nuclear reactions" the
verse is a very accurate description of what goes on inside a star.
These nuclear reactions cause the stars to radiate all types of
radiation into space, from x-rays and gamma rays in the short waves
to the longer radio waves. The visible section of those waves which

\textsuperscript{25} \textit{Microsoft Encarta Reference Library, op.cit., s.v. “How stars produce energy”}

\textsuperscript{26}\textit{Al- Qur'an, 24:35.}
are found between the ultra-violet and the infra-red is what we call sunlight.  

On the other hand, planets do not emit any light of their own, but instead shine by reflected light. The Qur'anic guidance in this regard runs as follows:

"Blessed is He who has placed in the heaven constellations of stars and has placed in it a lamp and a moon enlightening."  

"It is He who gave the sun his brightness and the moon her light."  

In 1965, a very important discovery was made, and that was the background radiation which supported the Big Bang theory. But, the Big Bang theory, together with the detection of the red shift in the spectrum of far away galaxies, gave birth to yet a new concept and that was the universe is expanding.

Light is made up of waves, and redshift is a change, caused by the object's motion, in the wavelength of light radiated by an object.

---

27 Microsoft Encarta Reference Library, op.cit., s.v. "light"
28 Ibid., s.v. "planet"
30 Ibid., 10:5.
Redshifts occur because of a phenomenon scientist's call the Doppler Effect. The Doppler Effect occurs when a wave-emitting object moves toward or away from an observer, and the observer sees or hears the waves differently than he or she would if the object were stationary relative to the observer. If a light-emitting object is moving away from an observer, each wave of light leaves the object from a point slightly farther away from the observer than the previous wave. Therefore, the distance between waves (called the wavelength) that the observer sees is longer than it would be if the object were stationary. Austrian physicist Christian Johann Doppler describes this effect in sound waves in the mid-1800s, and it became known as the Doppler Effect for all types of waves. When applied to light waves it was found that if the source of light is approaching its light would be shifted towards the blue end of the spectrum, while as light from a receding source would be shifted towards the red end of the spectrum. While analyzing the light we receive from distant galaxies it was found that they all had a red shift meaning that they were flying away from us. That contribution of the red shift analysis meant that the universe is indeed expanding. This finding is literally mentioned in the Qur'an.

وَالسُّمَاءُ بِتَبَتَا بَيْنَاهَا بِأَيْدٍ وَإِنَّا نُمُوسِفُونَ (سورة الدراي)
"And the sky, We created with might (power) and we are expanding\textsuperscript{32} it\textsuperscript{33}.

During the period of the revelation of the Qur'an (7th century C.E.), it was still believed that all the stars in the sky including our sun were eternal and are made of a material that never fades or decays. No one was really aware of the nature of the reactions that take place inside stars. The Sun cannot shine forever, because it will eventually use up its present fuel. The nuclear fusion reactions that make the Sun glow depend on the element hydrogen, but the hydrogen in the Sun's core will eventually run out. Nuclear reactions have converted about 37 percent of the hydrogen originally in the Sun's core into Helium. Astronomers estimate that the Sun's core will run out of hydrogen in about 7 billion years.

The Sun will grow steadily brighter as time goes on and more quantity of Helium accumulated in its core. Even as the supply of hydrogen dwindles, the Sun's core must keep producing enough pressure to keep the Sun from collapsing in on itself. The only way it can do this is to increase its temperature. The increase in temperature raises the rate at which nuclear reactions occur and makes the Sun brighter. As such it is presumed that in 3 billion years, the Sun will be

\textsuperscript{32} Here the word "expanding" is used in the present tense and not in the past which again is in agreement with the fact that the expansion of the universe is a continuous process.

\textsuperscript{33} Al' Qur'an, 51:47.
hot enough to boil Earth’s oceans away. Four billion years thereafter, the Sun will have used up all its hydrogen and will balloon into a giant star that engulfs the planet Mercury. At this point in its life, the Sun will be a red giant star. The Sun will then be 2,000 times brighter than it is now, and hot enough to melt Earth’s rocks. At this time the outer solar system will get warmer and more inhabitable. The icy moons of the giant planets may warm enough to be covered by water instead of ice.

It is further presumed that when the giant Sun uses up its fuel, it will no longer be able to support the weight of its inner layers, and they will begin to collapse toward the core, eventually producing a small, dense, cool star called a white dwarf. The Sun will then have about the same radius as Earth has, but it will be much denser and more massive than Earth. The Sun will become a white dwarf star about 8 billion years from now. After it becomes a white dwarf, it will cool slowly for billions of years, eventually becoming so cool that it will no longer emit light. Here, the Qur’an uses the very accurate scientific words:

"Then when stars will fade out".

The finite life of stars is also referred to:

---

34 *Microsoft Encarta Reference Library, op.cit.,* s.v. "The sun’s remote past and distant future"
35 *Al Qur’an, 77:8.*
...He has ordained the sun and the moon, each one runs (it's course) for an appointed time...\textsuperscript{36}

Chapter 81 of the Qur'an at its outset describes the end of heavenly bodies as follows:

إذا الشمس كُرَّت وإذا النجوم الكدرت وإذا البحر سجرت (سورة الكوثر)

“When the sun will be folded up, and when the stars will lose their luster...and when the oceans will be made to boil”.\textsuperscript{37}

It is very significant to note that verse reveals “When the stars will lose their luster” and not “When the sun will lose its luster”, because the boiling of the oceans will be a result of the expansion of the sun (red giant stage) and not it's folding or collapse, that is, the ocean will boil over long before the sun starts to fold or collapse. Also, the term “كدرت” means foldup or collapse”, as used in the Qur'an, is the precise term used by today's astronomers to describe that stage of a star’s life.

Whilst the Big Bang provided an explanation as to the origin of the universe, it still remained necessary to calculate its age. To do so,

\textsuperscript{36} Ibid., 13:2.
\textsuperscript{37} Ibid., 81:1, 2, 6.
astronomers once again rely on red shift to calculate the speeds and distance of the farthest galaxies\textsuperscript{38} and quasars\textsuperscript{39}.

Allah (S.W.T.) has not ‘finished’ creation; rather, it is an ongoing process. The Qur’an mentions:

\[ 	ext{...and He creates that which you do not know}. \]

\[ 	ext{...Allah creates what He will. Verily Allah has power over all things}. \]

This is very significant from a scientific point of view because man is gradually beginning to observe and understand certain natural phenomena which are still in a process of formation. One prime example is our observation of still-emerging galaxies from huge clouds of nebulae. Another is the creation of new species, with its associated evidence of strange and exotic "intermediate" life forms turned into fossils.

\textsuperscript{38} Galaxy is a group of billions of stars and their planets, gas, and dust that extends over many thousands of light-years and forms a unit within the universe. Held together by gravitational forces, most of the estimated 50 billion galaxies are shaped as spirals and ellipses, with the remainder being asymmetrical.

\textsuperscript{39} Quasar is a compact object in space, usually with a large red shift indicating extreme remoteness that emits huge amounts of energy, sometimes equal to the energy output of an entire galaxy.

\textsuperscript{40} \textit{Ibid.}, 16:8

\textsuperscript{41} \textit{Ibid.}, 24:45
A significant number of scientists and writers have come to realize that the ability of the physical world to organize itself constitutes a fundamental, and deeply mysterious, property of the universe. The fact that nature has creative power, and is able to produce a progressively richer variety of complex forms and structures, challenges the very foundation of contemporary science. The greatest riddle of cosmology, writes Karl Popper, the well-known philosopher, is that "The universe is, in a sense, creative".42

The orbits of the infinite number of the stars and all the galaxies are the result of immaculately precise balances. These very accurate balances are clear indications of the existence of a supreme governing power that is responsible for creating as well as sustaining the universe. The Qur'an speaks of these fine balances:

\[ \text{\textit{وَالسَّمَاءَ رَفَعَهَا وَوَضَعَ الْمِيزَانَ}} (سُورةَ الرَّحْمَٰن) \]

"He elevated the sky and setup the balance".43

If the moon was closer to the earth, the tides would rise causing gigantic waves that would destroy life on islands and coastal areas. If the moon was further away from the earth the tides would come to a standstill leading to the stagnation of seas, the result of which would be grave damage to marine life. These very precise

42 www.najaco.com, s.v. "on the ongoing process of creation"
43 Al-Qur'an, 55:7
measurements of such variables as distance, mass, speed etc. are referred to in the following verses:

الشمس والقمر يحببان (سورة الرحمن)

"The sun and the moon are bound by a schedule".  

The earth spins on its axis once every 24 hours. If it does not spin, the oceans would empty all their waters and if it spins much faster it would disperse into empty space. The spinning movement is also responsible for the night and day, without which one half of the earth would be under continuous sunlight and heat up excessively while the other half would be submerged in total darkness and freeze to death. The Spinning of the earth is also mentioned in the Qur'an:

خلق السماوات والأرض بألحق بكُور النَّسل على النَّهار وِبِكُور النَّهار على الْلَّيْلِ  
وَسَخَّرَ الشَّمْسِ والْقَمْرِ كُلٌّ يَجْرِي لأجل مُسْمَّى آلهُ العزيز العظيم (سورة النور)

He has created the heavens and the earth with truth. He makes night to succeed day and He makes day to succeed night, and He made the sun and the moon obedient, each running for an appointed term. Lo! He is the Mighty, the Forgiver.  

---

44 Ibid., 55:5  
45 Microsoft Encarta Reference Library, op.cit., s.v. "moon"  
46 Al-Qur'an, 39:5
Today we know that the Earth is oval shaped, bulging at the equator. Fourteen centuries ago it was believed that the earth is flat. It was not known then that the earth is round oval. The Qur'an again states that the earth is oval:

\[\text{والأنَّ طَيْباً جَاءَهَا} \text{ (سورة النازعات)}\]

"And after that He spread the earth [like a dahiya]."\(^47\)

The word "\textit{dahiya}" in Arabic means an egg, hence the oval shape. But the verse also includes a further remarkably accurate scientific fact. The words 'after that' clearly indicate that the earth acquired the oval shape at a later stage after its formation. Modern science will testify that the bulging of the earth at the equator is a result of the continuous spinning of the earth on its axis, and thus had to occur sometime after the formation of the earth. The earth spins on its axis at a speed of one thousand kilometers per hour. The earth rotates round the sun once every 365.25 days. Whilst doing so it is tilted on its axis at an angle of 33 degrees. As a result, the seasons occur making it possible for the habitation on the planet. If the earth was not tilted on its axis the poles would have been submerged in continuous cold darkness preventing the seasonal thaw of the polar ice. The accumulating ice would

\(^{47}\) \textit{Ibid.}, 79:30
eventually result in non shifting frozen poles and little water elsewhere.\textsuperscript{48}

The rotation of the earth around the sun was not known in the 7th century C.E. At that time it was still believed of the earth as a non moving planet at the centre of the universe. Due to the apparent movement of the sun, moon and stars in the sky, it was assumed that they are moving around the earth. The movement of the earth in space is confirmed in the following verse:

\begin{verse}
\textit{And you see the mountains, you think they are firm, (but) they will be flying like clouds: the doing of Allah who has perfected all things. Verily He is aware of what you do}. \textsuperscript{49}
\end{verse}

Since the earth is moving in space thus everything on earth is moving with it, including the mountains. If the earth’s crust had been thicker than its present thickness all the oxygen would have been absorbed into the earth. Without oxygen no life would be possible. Similarly, if the oceans were much deeper, all the oxygen and carbon dioxide would have been absorbed into the oceans with similar results. All these precise specifications are referred to in the following verse:

\textsuperscript{48} Microsoft Encarta Reference Library, loc.cit.
\textsuperscript{49} \textit{Al Qur'an}, 27:88
“It is He who created the heavens and the earth in truth (with a purpose)…”

2.2 The atom

The Qur'an provides guidance with regard to the formation of elements. About one of the elements created in the earth it speaks:

...وَأَنزَلَ النِّحْدِيَّةَ فِيهِ بَأْسًا شَدِيدًا... (سورة الحديد)

“...and [He] sent down iron wherein is mighty fright…”

‘Mighty fright’ (نَاسْمُ شَدِيدٍ) means it contains that power which was necessary for war purposes. The sword, canon, the tank and other armaments are made of iron, which frighten the enemy and break their backs. Similarly this power can also be used to punish the guilty. Moreover, iron is also a thing of common usefulness as it is used on a large scale in various industries.
The formation of the elements poses further intriguing questions. The atoms of elements are comprised of a nucleus orbited by a number of electrons. The nucleus contains a number of protons, which are positively charged, and a number of neutrons which are neutral in charge. But since like charges repel each other while opposites attract we might expect the nucleus to split apart with every proton trying to get away from every other proton. What is it then that holds them together? Gravity, due to the mass of the protons and neutrons, is certainly insufficient. It is believed that there is a strong binding force many thousand times stronger than the gravity.

The scientists believed for a long time that atoms were the smallest components of matter. They were of the opinion that there would be nothing found within the atom. They all held the view that an atom could not be divided. However Joseph John Thomson (1856-1940C.E.) demonstrated by a series of experiments in the laboratory came to the conclusion that there were particles within

---

the atom that carried a negative electrical charge. He called them electrons. He was also able to discover the weight of these particles and found out that they weighed 1/20,000 parts of the hydrogen atom, the lightest element known to man.\textsuperscript{55}

Working from Newzealand, Ernest Rutherford (1871-1937C.E.) was also interested in the study of the nature of electrons. He wanted to see if he could find anything else within the atom. Hans Wilhelm Geiger (1882-1945C.E.) who discovered the Geiger counter, worked with him on this study. They decided that the best way to learn what was within the atom was to blow it apart. They decided to shoot the atom with a particle in the laboratory having a strong positive electrical charge. They called this as alpha particle.\textsuperscript{56}

Finally, in the year 1911C.E. after a series of experiments in the laboratory, Rutherford concluded that the atom consists of a very small, heavy center, called the nucleus. Far away within the shell of the atom were the electrons, each one of them orbiting at high speeds around the nucleus.\textsuperscript{57} Although Rutherford now had a fair idea of what the atoms looked like. However, many questions remained to be answered. What was the nucleus made of? What balanced the negative electric charge of the electrons? He performed another set of experiments and concluded the nucleus was positively

\textsuperscript{55} Microsoft Encarta Reference Library, op.cit., s.v. "Electron"

\textsuperscript{56} Ibid., s.v. "Geiger, Hans Wilhelm"

\textsuperscript{57} Ibid., s.v. "Rutherford"
charged. He called these positive charged particles as protons. Now he had a complete picture of the atom.

At the same time, there were other scientists, who were trying to discover the composition of the Nucleus. Following his discovery of the proton in 1919, Rutherford suggested that a third particle, in addition to the proton and the electron, existed inside the atom. In 1932 C.E. British physicist James Chadwick (1891-1974 C.E.) measured the energy of the protons emerging from the hydrogen atoms and showed that they had been knocked out by a particle of about the same mass, but electrically neutral. This new particle was therefore named the neutron. It was also found that protons and neutrons moved in a circle at different levels within the nucleus of an atom, just as electrons travel in circles outside the nucleus. With the discovery of neutrons in the year 1932 C.E. the idea about the composition of atom was comprehended in a better way.\footnote{\textit{Ibid.,} s.v. "Neutron"}

Nevertheless, new discoveries led scientists to suggest that there was further scope to study the composition of atom. Thus, in the 4\textsuperscript{th} decade of 20\textsuperscript{th} century a new branch of physics emerged which exclusively dealt with the science of elementary particles. This led to the idea that some particles also behaved as wave of energy without any mass. It was later discovered that these elementary particles were not elementary; and some particles acted not only as
particles, but also as waves of energy without any mass. The first particle found was an electron with a positive charge. Carl D. Anderson (1905-1991 C.E.) discovered it in the year 1932. It was called as a positron. He found that some atoms struck by certain rays sent out a particle exactly like the electron, except for a positive electric charge. It had not been noticed before for its total life is one-billionth of a second.59

In 1935, Hideki Yukuwa (1907-1981 C.E.) of Kyoto, University of Japan, said that there should be another particle in the nucleus of the atom. He called this particle the meson. He said that the meson was the energy bond that held together the particles within the nucleus. Carl Anderson also found out the meson working in his laboratory. Later on, it was found that there are two types of mesons-the \( \pi \) meson and the \( \mu \) meson and that the former was denser than the later.60

Earlier in 1931, an Austrian-born Swiss physicist and Nobel laureate named Wolfgang Pauli (1900-1958 C.E.) had formulated that there was another particle having no mass that was being sent out from some elements. It was able to get rid of its energy during

---

59 Ibid., s.v. “Positron”
60 Ibid., s.v. “meson”
radioactivity. In 1956, these observations led to the discovery of neutrinos.\textsuperscript{61}

When a positron and an electron hit each other, both disappear, and energy is sent out. It is for this reason that the positron is also called as an anti-electron, meaning an opposing electron. This led to the belief that perhaps there is an antiparticle for each of the particles of the atom. At present, this belief has been proved correct. A total of more than 30 particles and antiparticles have been found within the atom and thus is in line with the information contained in the Qur'\text{\textasciitilde}ân. These sub-atomic particles are also mentioned in the Qur'\text{\textasciitilde}ân:

\begin{equation}
\text{لاَ يَغَبِبُ عَنْهَا مَثْلُ ذَرَةٍ فِي السَّمَاوَاتِ وَلَا فِي الأَرْضِ وَلَا أَصْغرُ مِنْ ذَلِكَ وَلَا أَكْبَرُ إِلَّا هُوَ فِي كِتَابٍ مُّبِينٍ (سَورَةُ سَبْتُ)}
\end{equation}

"... Not an atom’s weight or less than that or greater escapes Him in the heavens or in the earth, but it is in a clear book".\textsuperscript{62}

This Qur'\text{\textasciitilde}anic verse clearly indicates that the atom is not the smallest form of substance but that there are particles smaller than the atom. This might seem common knowledge today but it was not so in the 7th century.

\textsuperscript{61} Ibid., s.v. "neutrino"

\textsuperscript{62} Al-Qur'an, 34:3
2.3 Atmosphere

The atmosphere acts as a protective shield that absorbs harmful radiations. The sun, like any other star, radiates at a wide range of wavelengths. The visible waves, which we call sunlight, are only a portion of that radiation, and that light lies between the ultra-violet and the infra-red rays. The sun also radiates at wave lengths longer than what the human eye can see and that is in the infra-red and the radio wave regions, and also in wave lengths shorter than we can see in the ultra-violet, X-ray and Gamma Ray regions. These short waves (X-ray and Gamma rays) are completely blocked off in the upper layers of the earth's atmosphere. While most of the ultra-violet rays
are absorbed in the ozone layer only a small amount of ultra-violet rays can penetrate, and these are the rays that cause us sunburn, and in excess, are said to cause skin cancer. The ozone\textsuperscript{63} layer lies at about 50 kilometers above the earth's surface and works as a natural shield to protect us from harmful sun rays.\textsuperscript{64}

The Qur'an asserts this function:

\begin{equation}
\text{وَجَفَّنَا السَّمَاءَ سَقْفًا مَّحْفُوظًا وَهُمْ غَنِّيًا مَّعَ عِبَادَهُ}
\end{equation}

"And We have made the sky [Samā]\textsuperscript{65} a roof safe. Yet they turn away from its signs".\textsuperscript{66}

\begin{equation}
\text{حَتَّى إِذَا بَلَغَ مَطْلَعَ الْشَّمْسِ وَجَدْنَا نَفْتَعُهُ عَلَى قَوْمٍ لَّمْ نَجْعَلَ لَهُمْ مِنْ ذُرُّوتِهَا سَتْرًا.}
\end{equation}

"Till, when he reached the rising place of the sun, he found it rising on a people for whom We had appointed no shelter from it [the sun].\textsuperscript{67}

---

\textsuperscript{63}Ozone is a form of oxygen.


\textsuperscript{65} The words "Samā" and "Samawāt" are used in the Quran in different meanings. The word "Samawāt" (skies), which is the plural of "Samā" (sky), is always used to denote the heavens or the universe as a whole. The word "Samā" is usually used to denote our immediate sky or the earth's atmosphere. As an example of the two uses, we read: "God created the 'samawāt' (heavens) and the earth, truthfully. This provides a sufficient proof for the believers." 29:44 Here the word "samawāt" (plural) means heavens or universes. "He (God) sends down from the 'samā' (sky) water for your drink, and to grow trees for your benefit." 16:10 Here the word "samā" (singular) is used to mean our immediate sky.

\textsuperscript{66} \textit{Al- Qur'ān}, 21:32

\textsuperscript{67} \textit{Ibid.}, 18:90
The verse indicates the presence of a people, and thus areas, that are not shielded. This is in line with the current knowledge concerning the existence of holes in the ozone layer. It is generally thought that these holes have always existed. The matter has suddenly acquired an alarming nature because the size of these holes is greatly being enlarged as a result of man's pollution of the planet.

Another scientific knowledge that was referred to the Qur'an centuries before man's actual discovery of it relates to the composition of the atmosphere. It is now known that the higher we ascend in the sky the less air we would find, and thus the less oxygen so vital for respiration. A person flying at great heights in aircraft or air balloon would feel a sharp contraction of the lungs causing pain.

فيَمَنْ يُزِيدُ اللَّهُ رَبّهُ بِثَرْحٍ صَدْرًا لِلإِسْلَامِ وَفِيَمَنْ يُزِيدُ رَبّهُ بِصَدْرٍ صَغِيرٍ صَغِيرًا حَرَجاً كَأَنْ يَصَعَّلَ فِي السَّمَاءِ... (سُورَةُ الأنعام)

"Whom Allah wills to guide, He opens his breast to Islam; and whom He wills to mislead, He makes his breast small and narrow as if he is climbing sky-high..."

The atmosphere acts as a medium for the movement of clouds to supply rain to all the corners of the globe and maintain all types of vegetation.

---

69 *Al-Qur'an*, 6:125
Do you not see that Allah drives the clouds, then gather them, then piles them in layers? Then you see rain coming out from between them...

And it is Allah who sends the winds and they raise the clouds; then We lead them to a dead land and revive therewith the earth after its death. Such is the Resurrection.

2.4 Oceans and seas

---

Ibid., 24:43

Ibid., 35:9
The contracting nebula caused the earth to be very hot in the initial stages. As it slowly began to cool the heavier elements like iron fell to the centre whilst the lighter compounds like granite and oxides surfaced at the top. The cooling continued and a thin crust formed. The layer immediately beneath the crust eventually started to solidify giving rises and depressions above it leading to the formation of mountains and valleys. When the surface cooled further, to below 100 degrees centigrade (100°C), liquid water (which before then was still trapped inside the earth) began to form and fill the depressions that are now the oceans and seas.\(^2\) The knowledge that all the water was once trapped inside the earth and then was drawn out is mentioned in the Qur'an:

\[
\text{أخرج منها ماءها ومراعها}(\text{سورة النازعات})
\]

“And [He] produced there from its [the earth] water and pasture”.\(^3\)

An interesting geographical fact, relating to high and low land on earth, is mentioned in the following verse:

\[
\text{غلبت الروم في أدنى الأرضي...}(\text{سورة الروم})
\]

“The Romans have been defeated in the nearby territory [in the lowest of the lands]...”\(^4\)

---

\(^2\) Microsoft Encarta Reference Library, op.cit., s.v. “Age and origin of the earth”

\(^3\) Al-Qur'an, 79:31

\(^4\) Ibid., 30:2-3
It is now known that the area near the Dead Sea, which was the scene of these battles, is the lowest spot on earth below sea level.\textsuperscript{75}

There are innumerable things such as different minerals, petrol etc.on the sea bed and below the sea bed. For using these oceanic resources and also for harnessing ocean in proper ways, man must study to know qualities of ocean water, ocean bed and its geographical or geological structures, different minerals available, their distribution etc. and man must find out or make devices or ways and means for using these resources. Gratefulness to Allah (S.W.T.) will also be associated along with the use of Allah's bounties available in the oceans. In this regard Allah says:

وَهُوَ الَّذِي سَخَّرَ الْبَحْرَ

"And He it is who has subjected the sea to be of service..."\textsuperscript{76}

Again in another verse Allah guides:

اللَّهُ الَّذِي سَخَّرَ لَكُمْ الْبَحْرَ لِتَجْرَيْنَ فِيهِ بَيَاضَةً وَانْتِظَرُواْ مِن فَضْلِهِ وَلْتَلْكِنْ تُشْكُرُونَ (سُورَةُ النَّبِل)

“It is Allah who has subdued the ocean to you so that ships may sail on it at His bidding, so that you may seek His bounty and render thanks to Him.”\textsuperscript{77}

\textsuperscript{75} Microsoft Encarta Reference Library, op.cit., s.v. “Dead Sea”
\textsuperscript{76} Al-Qur’an, 16:14
\textsuperscript{77} Ibid., 45:12
In this way after getting indication or information of bounties of Allah in the sea and instruction to harness them, no believers (Mumin) can stay away from study of sea and get benefit from it. In this modern age of science, a subject viz “Oceanography” has thus been opened in many universities. For the profession of sailing on the sea i.e. for becoming a navy and also to learn techniques of harnessing oceanic resources “Marine Engineering” are taught in many institutions.78

Modern Science has discovered that in the places where two different seas meet, there is a barrier between them. This barrier divides the two seas so that each sea has its own temperature, salinity, and density.79 For example, Mediterranean Sea water is warm, saline, and less dense, compared to Atlantic Ocean water. When Mediterranean Sea water enters the Atlantic over the Gibraltar hill, it moves several hundred kilometers into the Atlantic at a depth of about 1000 meters with its own warm, saline, and less dense characteristics. The Mediterranean water stabilizes at this depth.80 Although there are large waves, strong currents, and tides in these seas, they do not mix or transgress this barrier. The Qur'an mentions that there is a barrier between two seas that meet and that they do not transgress. Allah (S.W.T.) prescribes:

78 Dr. A. Rahman, Islam on Science and Technology, New Delhi, Adam Publishers, 2005, p.50-51
79 Dr. Zakir Abdul Karim Naik, The Qur'an and Modern Science Compatible or Incompatible?, Mumbai, Islamic Research Foundation (IRF), 2001, p.27. Also see Davis, Principles of Oceanography, p. 92-93.
80 Idem
"He released two seas so that they meet. Between them is a barrier which they cross not."\(^{81}\)

But when the Qur'an speaks about the divider between fresh and salt water, it mentions the existence of "a forbidding partition" with the barrier. Allah (S.W.T.) says in the Qur'an:

\[\text{"It is He who had caused the two seas (river and sea) to meet; one palatable, sweet, and the other saltish, bitter; and has set a barrier between them, an insurmountable obstruction."}^{82}\]

One may ask, why does the Qur'an mention the partition while speaking about the divider between fresh and salt water, but does not mention it while speaking about the divider between the two seas? Modern science has discovered that in estuaries\(^{83}\), where fresh (sweet) and salt water meet, the situation is somewhat different from what is found in places where two seas meet. It has been discovered that what distinguishes fresh water from salt water in estuaries is a "Pycnocline zone with a marked density discontinuity separating the

---

\(^{81}\) Al-Qur'an, 55:19-20.

\(^{82}\) Ibid., 25:53.

\(^{83}\) Estuary is the wide lower course of a river where the tide flows in, causing fresh and salt water to mix.
two layers. This partition (zone of separation) has a different salinity from the fresh water and from the salt water.

This information has been discovered only recently, using advanced equipment to measure temperature, salinity, density, oxygen dissolubility, etc. The human eye cannot see the difference between the two seas that meet; rather the two seas appear to us as one homogeneous sea. Likewise, the human eye cannot see the division of water in estuaries into the three kinds: fresh water, salt water, and the partition (zone of separation).

\[84Dr. Zakir Abdul Karim Naik, \textit{op. cit.}, p.29. \textit{Also see} \textit{Introductory Oceanography} \textbf{by Thurman, pp. 300-301.}\]

\[85\textit{Idem}\]
2.5 Clouds

Scientists have studied various types of cloud and have realized that rain clouds are formed and shaped according to a peculiar pattern and certain steps connected with certain types of wind and clouds. One kind of rain cloud is the cumulonimbus cloud associated with thunderstorms. Meteorologists\(^\text{86}\) have studied how cumulonimbus clouds are formed and how they produce rain, hail, and lightning. They have found that cumulonimbus cloud go through the following steps to produce rain:

\(^\text{86}\) A meteorologist is a person who studies the atmosphere.
1. The clouds are pushed by the wind: Cumulonimbus clouds begin to form when wind pushes some small pieces of clouds (cumulus) to an area where these clouds converge.

2. Joining: Then the small clouds join together forming a larger and denser cloud.

3. Stacking: When the small clouds join together, updrafts within the larger cloud increase. The updrafts near the center of the cloud are stronger than those near the edges. These updrafts cause the cloud body to grow vertically, so the cloud is stacked up. This vertical growth causes the cloud body to stretch into cooler regions of the atmosphere where drops of water and hail formulate and begin to grow larger and larger. When these drops of water and hail become too heavy for the updrafts to support them, they begin to fall from the cloud as rain, hail, etc.87

Allah (S.W.T.) affirms in the Qur'an:

```
إِنْ تَرَى اللَّهَ يَجْعَلُ السَّمَاءَ مِنْ جَبَالٍ فِيهَا مِنْ بُرَّةٍ فَيُصِيبُ بِهِ مِنْ يَتَّشَاءٍ وَتَصِرَّفُهَا عَنْ مَنْ يَتَّشَاءُ

ِبِكَادَ مِنْ شَابُّهٍ يَدْهَبُ بِالْأَنْبَاضِ (سُورةُ النُّورَ)
```

Do you not see that Allah drives the clouds, then gather then, then piles them in layers? Then you seen rain coming out from between

---

87 www.it-is-truth.org
them; He sends down hail from the heavens, from the mountains which are therein, and smites with it whom He will and turn it away from whom He pleases. The flash of the lightning almost snatches away the sight.88

Meteorologists have only recently come to know these details of cloud formation, structure, and function by using advanced equipment like planes, satellites, computers, balloons, and the like to study winds and its direction, to measure humidity and its variations, and to determine the levels and variations of atmospheric pressure.

Meteorologists have found that these cumulonimbus clouds, that shower hail, reach a height of 25,000 to 30,000 feet (4.7 to 5.7 miles), like mountains, as the Qurʾān mentions: And He sends down hail from mountains (clouds) in the sky...89 Actually clouds become electrified as hail falls through a region in the cloud of super cooled droplets and ice crystals. As liquid droplets collide with hail, they freeze on contact and release latent heat90. This keeps the surface of the hail warmer than that of the surrounding ice crystals.91

When the hail comes in contact with an ice crystal, an important phenomenon occurs. Electrons flow from the colder object toward the warmer object. Hence, the hail becomes negatively charged. The same effect occurs when super cooled droplets come in contact with a

88 Al. Qurʾān, 24:43
89 Idem
90 Latent heat is the amount of heat absorbed or released by a substance sufficient to produce a change of phase.
91 www.it-is-truth.org
piece of hail and tiny splinters of positively charged ice break off. These lighter, positively charged particles are then carried to the upper part of the cloud by updrafts. The hail, left with a negative charge, fall toward the bottom of the cloud, thus the lower part of the cloud becomes negatively charged. These negative charges are then discharged to the ground as lightening. We conclude from this that hail is the major factor in producing lightening. This information on lightening was discovered only recently.

2.6 Deep Seas and Internal Waves

Allah (S.W.T.) asserts in the Qur’an:
Or (the unbelievers' state) like darkness on a vast, bottomless sea, there covers him a wave, above which is a wave, above which is a cloud. Layer upon layer of darkness. If he stretches out his hand, he can not see it...  

This verse mentions the darkness found in deep seas and oceans, where if a man stretches out his hand, he cannot see it. The darkness in deep seas and oceans is found around a depth of 200 meters. At this depth, there is almost no light. Below a depth of 1000 meters there is no light at all.93 Human beings are not able to dive more than forty meters without the aid of submarines or special equipment. Human beings cannot survive unaided in the deep dark part of the oceans, such as at a depth of 200 meters.

Scientists have recently discovered this darkness by means of special equipment and submarines that have enabled them to dive into the depths of the oceans. This can very clearly understood from the text of the above quoted verse, “...on a vast, bottomless sea, there covers him a wave, above which is a wave, above which is a cloud....”, that the deep waters of seas and oceans are covered by waves, and above these waves are other waves. It is clear that the second set of waves are the surface waves that human eye see, because the verse mentions that above the second waves there are clouds. But what about the first waves? Scientists have recently discovered that there are internal waves which “occur on density interfaces between layers

92 Al-Qur'an, 24:40.
93 Dr. Zakir Abdul Karim Naik, op.cit., p.31.
of different densities. The internal waves cover the deep waters of seas and oceans because the deep waters have a higher density than the waters above them. Internal waves act like surface waves. They can also behave, just like surface waves. Internal waves cannot be seen by the human eye, but they can be detected by studying temperature or salinity changes at a given location.

2.7 Mountains

The mountains that were formed, as the earth's crust cooled, play a major role (as modern geological theories indicate). They contribute to affixing the continents in place. These continents are

94 Microsoft Encarta Reference Library, op.cit., s.v. "deep sea"
95 Idem
virtually floating on melted layers that lie beneath. In general, the thickness of the earth’s crust is about five kilometers. However, the thickness directly beneath mountains extends up to thirty five kilometers.\(^{96}\) That is because beneath every mountain lies a reversed shaped mountain root below the surface. These reversed mountains do the job of pegs in affixing the land. This is very accurately stated in the Qur’an:

\[ \text{Al-} \text{Qur'}\text{'an, 78:6-7} \]

“Have We not made the earth as floor? And the mountains as pegs?\(^{97}\)

As the earth does not rest on any support, it seems inevitable that the earth should be balanced on all sides to ensure its smooth functioning and security against earthquake. The mountains and hills are so placed on the northern hemisphere to balance the oceans on the southern.\(^{98}\) The Qur’an pronounces:

\[ \text{Al-} \text{Qur'}\text{'an, 31:10} \]

He created the heavens without pillars as you see it, and set into the earth mountains so that it may not shake with you...\(^{99}\)

---


\(^{97}\) \text{Al-} \text{Qur'}\text{'an, 78:6-7}.

\(^{98}\) Dr. Mohammad R. Mirza and Muhammad Iqbal Siddiqi, op. cit., p. 85, 86.

\(^{99}\) \text{Al-} \text{Qur'}\text{'an, 31:10}.
And we spread out the earth, and placed therein mountains and caused to grow therein everything in due proportions.¹⁰⁰

They ask you about the mountains. Say: “My Lord will crush them into scattered dust, “And leave it (the earth) as a level plain, “Wherein you will see neither curve nor ruggedness”.¹⁰¹

2.8 Geology

Geology is the study of the planet earth, its rocky exterior, its history, and the processes that act upon it. Geology is also referred to

¹⁰⁰ Al-Qur'an, 15:19
¹⁰¹ Ibid., 20:105-107
as earth science and geoscience. The word geology comes from the Greek geo, “earth,” and logia, “the study of.” Geologists seek to understand how the earth formed and evolved into what it is today, as well as what made the earth capable of supporting life. Geologists study the changes that the earth has undergone during its 4.5 billion year history.¹⁰²

Allah (S.W.T.) at a number of places in the Qur’an directs the attention of human beings towards the geological science as:

وَآيَةٌ لَهُمُ الْأَرْضُ الْمَيْتَةَ أَحْيَانَا وَأَخْرَجْنَا مِنْهَا حَيَا فَمَنْ يَبْكُلُونَ (سورة يس)

The dead earth is a big sign to them. We gave it life, and from it brought forth grain so that they eat thereof.¹⁰³

أَوَلَمْ نُبْرِزْ إِلَى الْأَرْضِ كُمْ أَنْبِيَاتِهَا مِنْ كُلِّ زَوْجٍ كَمْ (سورة الشعراء)

Have they not seen the earth, how much of every beneficial kind We made to grow therein:¹⁰⁴

هُوَ الَّذِي جَعَلَ لَكُمُ الْأَرْضَ ذَلِكَ فَاعْمَشُوا فِي مَنَاكِبِهَا وَكُنُوْا مِنْ رُزْقِهِ وَإِلَيْهِ الْبَعْرُ (سورة الملك)

It is He Who has made the earth subservient to you. So walk over its shoulders and eat of His provisions, to Him is the resurrection.¹⁰⁵

وَإِلَيْ الْجُنُوبِ كَيْفَ نُصِبْتُمُ وَإِلَيْ الْأَرْضِ كَيْفَ مُسْلِحْتُمُ (سورة الغاشية)

¹⁰² Microsoft Encarta Reference Library, op.cit., s.v. “Geology”
¹⁰³ Al Qur’an, 36:33
¹⁰⁴ Ibid., 26:7
¹⁰⁵ Ibid., 67:15
[Do they not look] and at the mountains — how they are fixed firm? And at the earth — how it is spread out?\textsuperscript{106}

هوُ الّذِي خَلَقَ لَكُمَّ مَا فِي الأَرْضِ جَمِيعاً… (سورة البقرة)

It is He Who has created for you all things which are on earth…\textsuperscript{107}

Studies of earth’s surface and rocks have enabled scientists to know the time of formation of the earth (age of the earth), its process of differentiation and different materials or compositions of the surface. It enables man to use different minerals found on and below the surface of the earth.\textsuperscript{108}

\textsuperscript{106}Ibid., 88:19-20

\textsuperscript{107}Ibid., 2:29

\textsuperscript{108}Dr. A. Rahman, op.cit., p 47.
There is intimate relation between climates of a place and its agriculture. Wind and the atmospheric condition control the formation of clouds along with their movements and cause rain.
Proper rainfall converts a dead land into a living, fertile and beautiful land bearing a rich harvest.\textsuperscript{109} Allah (S.W.T.) guides in this regard:

\begin{quote}
 وهَوَاءُ الَّذِي يُرِيْسِلْ الرِّيَاحَ نُبُرُّرْيَ بَيْنَ يَدَيْ رَحْمَتِهِ حَتَّى إِذَا أَقْلَثْتُ سَحَاةَ فَقَالَتْ مَنْ قَدَمَ النَّبِيِّ

مِثْلكَ لِأَلْهَةٍ أَخَرَّجْتُهَا مِنْ كُلِّ الْمُلْكِ فَآمَنَ اِلَّا مَعَكَ اِلَّا مَعَكَ (سُورَةَ الْاَعْرَافِ)
\end{quote}

It is He who sends forth the winds as harbingers of His mercy. Then, when they bear a heavy cloud, We drive it to a dead land, then cause water to descend thereon, and thereby bring forth fruits of every kind...\textsuperscript{110}

For a good harvest, only rain is not sufficient, quality of land must be good i.e. land must be fertile. Allah has indicated this in the following verse:

\begin{quote}
 وَالْيَتِيدٌ الطَّيِّبُ يُخْرِجُ بِنَبَاتَهُ إِذَا رَحَّلَ وَالْيَتِيدٌ خُبْثٌ لَّا يُخْرِجُ إِلَّا كَذَٰلِكَ نُصْرُ الْآيَاتِ

لَقَوْمِ يَشْكُرُونَ (سُورَةَ الْاَعْرَافِ)
\end{quote}

From the good land, (rich) produce springs forth, by the will of its Lord, and from that which is vile, springs forth nothing but poor produce. Thus do We explain our signs differently to those who are grateful.\textsuperscript{111}

Thus there is necessity to study and research on climate and quality of land for good agricultural products. Detailed knowledge of climatic condition enables a cultivator to know pressure, temperature,
wind condition and probable rainfall of any place. On the other hand the awareness about the fertility, moisture conditions, ground water, and mineral contents of the soil enables the cultivator to decide about the cultivation of a specific crop. Acquaintance with the climatic conditions and quality of a particular land helps the cultivators to take the appropriate decisions for the cultivation of the most suitable crop that could yield best results.112

2.10 Hydrology and Hydrography

Hydrology is the science that deals with the waters of Earth—their properties, behaviour, and distribution. Hydrography is the

---

112 Dr. A. Rahman, op.cit., p 54.
scientific study of seas, lakes, and rivers, especially the charting of tides and changes in coastal bathymetry or the measurement and recording of river flow.\footnote{113Microsoft Encarta Dictionary, U.S.A., Microsoft Corporation, CD Rom edition 2003, s.v. “Hydrology and Hydrography”} In both the sciences water study is imperative. Water is the major constituent of living matter. From 50 to 90 percent of the weight of living organisms is water. Protoplasm, the basic material of living cells, consists of a solution in water of fats, carbohydrates, proteins, salts, and similar chemicals. Water acts as a solvent, transporting, combining, and chemically breaking down these substances. Blood in animals and sap in plants consists largely of water and serve to transport food and remove waste material. Water also plays a key role in the metabolic breakdown of such essential molecules as proteins and carbohydrates. This process, called hydrolysis, goes on continuously in living cells.\footnote{114Microsoft Encarta Reference Library, op.cit., s.v. “water in life”} In this regard Allah (S.W.T.) the Creator of all things proclaims:

\begin{axbquote}
...We made of water every living thing? Will they not then believe?\footnote{115\textit{Al-Qur'an}, 21:30}
\end{axbquote}
And Allah has created every animal from water. Of them, one (kind) creeps on its belly, and one (kind) walks on two legs, and one (kind) walks upon four. Allah creates what He will. Verily Allah has power over all things.116

وَهُوَ الَّذِي خُلِقَ مِنَ الْمَاءِ بَشْرًا... (سورة الفرقان)

And it is He Who has created man from water...117

For the sustenance of various lives on earth Allah has arranged distribution of water throughout the world. So that all may receive its support according to their respective needs.

وَأَنزَلْنَا مِن السَّمَاوَاتِ مَاءً طَهُورًا... لِتَحْيَسَ بِهِ بَلَدَةَ مَيْتًا وَتَسْقِي مِمَّا خَلَقْنَاهَا آنَاَمَا وَآخَامَا... (سورة الفرقان)

....And We send down purifying water from the sky, so that We may give life to the dead land, and provide drink for many cattle and people, that We have created. And verily We set it forth clearly among them...118

About 75 percent of the earth’s surface is covered by water. This means that water is predominant on our globe. Without water no living thing can survive. Such an important thing deserves studies, so that this unparallel bounty of Allah (S.W.T.) could be realized and also could further be used by man for diverse purposes. Regarding water, Allah (S.W.T.) further says:

أَفْرَأَيْتُمُ الْمَاءَ الَّذِي نَشْرِبْنَا... (سورة الواقعة)

---

116 Ibid., 24:45
117 Ibid., 25:54
118 Ibid., 25:48-50
“Have you thought over the water you drink?”

The above verse implies that man should study and research on the nature, composition and utility of water and glorify Allah (S.W.T.) for bestowing it with diverse qualities. In this regard, there are points of reflection in the following verse:

Do you not see that Allah sends down water from the sky and causes it to penetrate and gather in spring beneath? He brings forth plants of many colours. Then they wither, and you see them turn yellow, then He makes them chaff. Verily, herein is a reminder for men of understanding.

There are a few other verses in the Qur’an about water. Nowadays, knowledge about water has been substantially increased because of scientific studies and truth has been established regarding its universal essentiality in life formation, sustenance and survival processes. There has been extensive studies on diverse qualities of water, chemical characteristics etc., and techniques have been evolved for drinking pure water, supplying water for agricultural purposes, for generating electricity and for using it in many other ways.

---

119 Ibid., 56:68
120 Ibid., 39:21
In the Qur'an almighty Allah cites the case of one of the unbelievers who forbade the Prophet Muhammad (S.W.T.) from praying at the Ka'abah:

كَلَّا لَنِّنَ أُمِّى أَمْ تَدْعَوْنَ بَالْكَافِرِينَ قَادِيَةَ كَافِرِيَةٍ وَسُوَّرَةَ العِلَّاء

“Beware! If he desists not, We will drag him by the forelock [front of the head]. A lying, sinful forelock.” 121

The Arabic word *Nasiyha* means forelock. If we look into the skull at the front of the head, we will find the prefrontal area of the cerebrum. What does physiology tell us about the function of this area? A book entitled, “*Essentials of Anatomy and Physiology*”, says:

121 Ibid., 96:15-16
The motivation and the foresight to plan and initiate movements occur in the anterior portion of the frontal lobes, the prefrontal area. This is a region of the association cortex...In relation to its involvement in motivation; prefrontal area is also thought to be the functional center for aggression...

So, this area of the cerebrum is responsible for planning, motivating, and initiating good and sinful behaviour, and is responsible for telling lies and speaking the truth. Thus, it is proper to describe the front of the head as lying and sinful when someone lies or commits a sin, as the Qur'an points out: ...a lying, sinful Nasiyah (front of the head). Scientists, according to Professor Keith Moore, discovered these functions of the prefrontal area just sixty years back.

2.12 Aerodynamics

In this modern age "Aerodynamics" has been a major subject of science for study. Detailed knowledge of the atmosphere, air motion, its pressure, temperature, density and their variations is necessary for design and manufacture of modern means of communication, means of defence.

---

and offence, aircrafts, satellites, ships, missiles and rockets. Knowledge of atmosphere is also necessary to utilize all these in the best possible way and monitor their motions through atmosphere.

In other fields of our daily activities air or atmosphere is also used extensively. Thus from olden days air is being used for sailing purposes. Air driven machines are also being used nowadays for generating electricity. But most important of air is that it is most essential for life due to the presence of oxygen in it.\textsuperscript{123} Regarding air Allah (S.W.T.) says in the \textit{Qur'an}:

\begin{quote}
\begin{quote}
\text{وَمِنْ آيَاتِنَّا أَنَّ يُرِسِّلَ الرَّيَاحَ مُنَّاثَرَاتٍ وَيُبَيِّنُكُمْ مِنْ رَحْمَتِنَّ وَيَلْحَٰضُنَّ الْفَلَقَ بَيْنَهُ وَيَنَزِعُونَ مِنْ فَضْلِهِ وَتُعْلِمُونَ مِنْ (سُورَةَ الرُّوم)}
\end{quote}
\end{quote}

And of His signs is that He sends the winds as bearers of good tidings, so that you may taste of His mercy, and ships may sail at His command, so that you may seek His bounty and render thanks to Him.\textsuperscript{124}

In the above verse many qualities and bounties of winds have been identified. All the benefits getting from wind are nothing but Mercy of Allah. The winds are not only essential for surviving life, they are also means of purification and bring blessing of Allah in terms of rain which make the soil fertile and fill the rivers and ponds with fresh water. Air helps international business and mixing up through sea-ways (sailing) and now by air-ways (floating in air). Those

\textsuperscript{123} N.P.O. Green (et.al), \textit{Biological Science}, 2\textsuperscript{nd} ed., USA, Cambridge University Press, 1996, p.324.

\textsuperscript{124} \textit{Al- Qur'an}, 30:46.
who study and do research for utilizing wind will flourish and rejoice, while those who ignore or fail to understand Sign of Allah will perish.\textsuperscript{125}

2.13 Meteorology

Meteorology is the study of the earth's atmosphere and especially the study of weather. A meteorologist is a person who studies the atmosphere. Meteorology is divided into a number of specialized sciences. Physical meteorology deals with the physical aspects of the atmosphere, such as the formation of clouds, rain, thunderstorms, and lightening. Physical meteorology also includes the

\textsuperscript{125} Dr. A. Rahman, \textit{op.cit.}, p. 52.
study of visual events such as mirages, rainbows, and halos. The study of the winds and the laws that govern atmospheric motion is called dynamic meteorology. Synoptic meteorology is the study and analysis of large weather systems that exist for more than one day. Weather forecasting is part of synoptic meteorology. Agricultural meteorology deals with weather and its relationship to crops and vegetation. The study of atmospheric conditions over an area smaller than 1 sq km (0.4 sq mi) is called micrometeorology. Climate describes the average weather of a region. Climatology, a division of meteorology, is the study of a region’s average daily and seasonal weather events over a long period. The following verse describes different phenomena occurring in the atmosphere and prompts people to observe these phenomena so that people may get benefit from such observation:

Do you not see that Allah drives the clouds, then gather them, then piles them in layers? Then you see rain coming out from between them: He sends down hail from the heavens, from the mountains which are therein,

---

126 Microsoft Encarta Reference Library, op.cit., s.v. “Meteorology”
and strikes with it whom He will and turn it away from whom He please.
The flash of the lightning almost snatches away the sight.  

Not those winds, clouds in the atmosphere, together with the process of information of rain drops, hails and lighting all these topics of meteorology are mentioned in the above verse. By words “Do you not see” and “then you see rain”, Allah (S.W.T.) guides man to study these entire phenomenons.

2.14 Astronomy

Astronomy Map

Astronomy is the study of the universe and the celestial bodies, gas, and dust within it. Astronomy includes observations and theories about the solar system, the stars, the galaxies, and the general structure of space. Astronomy also includes cosmology, the study of

\textsuperscript{127} Al\textsuperscript{ }Qur'an, 24:43
the universe and its past and future. People who study astronomy are called astronomers, and they use a wide variety of methods to perform their research. These methods usually involve ideas of physics, so most astronomers are also astrophysicists, and the terms astronomer and astrophysicist are basically identical. Some areas of astronomy also use techniques of chemistry, geology, and biology.\textsuperscript{128}

Muslims have always had a special interest in astronomy. The moon and the sun are of vital importance in the daily life of every Muslim. By the moon, Muslims determine the beginning and the end of the months in their lunar calendar. By the sun Muslims calculate the time for prayer and fasting. It is also by means of astronomy that Muslims can determine the precise direction of the \textit{Qiblah}\textsuperscript{129}. The most precise solar calendar, superior to the Julian, is the Jilali, devised under the supervision of Umar Khayyam. The sun, the stars, the moon, the earth and many other astronomical signs are mentioned in the Qur'\textacute{a}n. For a long time European philosophers and scientists believed that the earth stood still in the centre of the universe and every other body including the sun moved around it. In the West, this geocentric concept of the universe was prevalent right from the time of Ptolemy in the second century B.C. In 1512 C.E. Nicholas Copernicus put forward his Heliocentric Theory of Planetary Motion,

\textsuperscript{128} Microsoft Encarta Reference Library, op.cit., s.v. “Astronomy”

\textsuperscript{129} The direction in which the Muslims face when performing the salah (ritual prayer) towards the Ka'bah in Makkah.
which asserted that the sun is motionless at the centre of the solar system with the planets revolving around it.\textsuperscript{130} 

In 1609 C.E. the German scientist Yohannus Keppler published the *Astronomia Nova*. In this he concluded that not only do the planets move in elliptical orbits around the sun, they also rotate upon their axes at irregular speeds. With this knowledge it became possible for European scientists to explain correctly many of the mechanisms of the solar system, including the sequence of night and day. After these discoveries, it was thought that the Sun is stationary and does not rotate about its axis.\textsuperscript{131} The *Qur'an* mentions:

\begin{verse}

\textit{And it is He who created the night and the day, and the sun and the moon, each one is floating in (its own) orbit.}\textsuperscript{132}
\end{verse}

The Arabic word used in the above verse is *yasbabun*. This word is derived from the word *sababa*. It carries with it the idea of motion that comes from any moving body. If this word is used for a person on the ground, it would not mean that he is rolling but would imply that he is walking or running. If this word is used for a person in water, it would not mean that he is floating but would imply that he is swimming. Similarly, if the

\textsuperscript{130} Dr. Zakir Abdul Karim Naik, op.cit., p.11-12.
\textsuperscript{131} Idem
\textsuperscript{132} *Al-Qur'an*, 21:33
The word *yasbah* is used for a celestial body such as the sun, it would not only mean that it is flying through space but would also mean that it is rotating as it goes through space. Most school textbooks have now incorporated the fact that the sun rotates about its axis. The rotation of the sun about its own axis can be proved with the help of an equipment that projects the image of the sun on the top of a table, so that one can examine the image of the sun without being blended. It is noticed that the sun has spots which complete a circular motion once every 25 days i.e. the sun takes approximately 25 days to rotate round its axis.

The sun travels through space at roughly 240 km per second (240 km/sec), and takes about 200 million years to complete one revolution around the centre of our Milky Way Galaxy.\(^\text{133}\)

The nature of the Sun and the nature of the moon are mentioned in the Qur'an:

\[
\text{وَجَعَلَ الْقَمْرَ فِيهِنَّ نِورًا وَجَعَلَ الْشَّمْسَ سَرَاجًا (سُورَةُ نُوحّ)}
\]

"And therein made the moon a light and the sun a Lamp [Siraja]." \(^\text{134}\)

The above Ayah shows that the difference between the sun and the moon is very obvious. It states that the sun is a Lamp, and the moon is a Light. What's the difference between both? A lamp is


\(^\text{134}\) *Al. Qur'an*, 71:16
something that produces light by using some kind of energy while the light is the result of that lamp. This is what the *Concise Columbia Encyclopedia* says about the sun:

> ...The sun's temperature is high enough for the occurrence of nuclear reactions, which are assumed to be the source of the sun's energy. Hans Bethe proposed a cycle of nuclear reactions known as the carbon cycle, in which carbon acts much as a catalyst, while hydrogen is transformed by a series of reactions into helium and large amounts of high energy gamma radiation are released.135

And this is what *The American Heritage Dictionary of the English Language* says about the moon: “The natural satellite of Earth, visible by reflection of sunlight and having a slightly elliptical orbit.”136 As we can see, the moon reflects the sun's light. This is exactly what the *Qur'an* says about the sun and the moon. The *Qur'an* also mentions the sun as a *Siraj*. *Siraj* is an Arabic term that means a mass of fire, which produces light. On the other hand, the *Qur'an* does not mention the moon as being in the state of *Siraj*, which is totally in conformity with the modern scientific notion about the sun and the moon.

![Qur'an verse](https://example.com/quranverse.png)


“It is not (possible) for the sun to overtake the moon, not can the night outpace the day. They move each in an orbit.”  

Here is an essential fact that is clearly stated: the existence of the sun's and moon's orbit, and also a reference is made to the travelling of these bodies in space with their own motion. This is what The Concise Columbia Encyclopedia says about the moon and the sun's orbit. “The lunar orbit is elliptical, and the average distance of the moon from the earth is about 240,000 mi [mile].”  

“The sun is c.28, 000 light-years from the nucleus and takes 200 million years to revolve once around the galaxy.”  

Also, the Qur'an asserts:


“The Sun is proceeding to its resting place; that is the decree of the Mighty One, All Knowing. And as regards moon, We have appointed for it mansions till it becomes as an old dry palm-branch.”

In this verse the Qur'an explicitly guides about the fact that the sun has an appointed or allotted amount of time that it will last for.

---

137 Al-Qur'an, 36:40
138 Concise Columbia Encyclopedia, op.cit., s.v. “sun's orbit”
139 Ibid., s.v. “sun light”
This agrees with the modern science which says that the sun will probably have a limited span of 5 billion years. However, the verse also mentions the moon's independent orbit around the earth in which it returns regardless of the sun's status with the earth. Here we can infer that the sun and the moon have independent orbits, one closely connected to that of the earth, which is the moon, and the other with a limited term of orbit and life span and independent of the moon's orbit.

In the above quoted verses, we see no reference to any facts stating the sun is orbiting around the earth, which at the time was a very popular belief. Rather, we see the Qur'ān stating that the moon and sun are quite independent of each other and that they follow the paths divinely prescribed for them. Muslims at the time followed whatever scientific fact was in popular reason and in fact, when Ibn Shatir during the 12th-13th century hypothesized that the earth was not the center of the universe and proved it by trigonometric means. Muslims did not visualize any significant problem with his theory. Later on, Copernicus restated this theory to the Europeans. He received the credit for the discovery even until today. At the time, his theory was rejected and he was threatened by the church to change his opinion; which he did.

We can see the Muslims throughout history have had no problems accepting true scientific facts as it was part of
their religious duty, but European Christians have always had to separate religion and science even until this very moment.

2.15 Geography

Geography is the science that deals with the distribution and arrangement of all elements of the earth's surface.\textsuperscript{141} Muslim scholars paid great attention to the study of geography. In fact, the Muslims' great concern for geography originated with their religion. The \textit{Qur'an} encourages people to travel throughout the

\textsuperscript{141} Microsoft Encarta Dictionary, op.cit., s.v. “Geography”
earth to see God’s signs and patterns everywhere. Islam prompts Muslims to have at least enough knowledge of geography to know the direction of the Qiblah in order to pray five times a day.

“He created the heavens without any pillars as you see it, and set into the earth mountains so that it may not shake with you…”

Until after 1300 years of the revelation of the Qur’an the human treasure of knowledge was not acquainted with this fact of mountains. But now geography has come to know it and in modern geographic terms it is called isostasy - equilibrium within Earth’s crust: a state of equilibrium between forces such as accumulated ice pushing down on a section of the Earth’s surface and those pushing up from below.

---

142 *Al-Qur’an*, 16:36
143 The direction in which the Muslims face when performing the salah (ritual prayer) towards the Ka’bah in Makkah.
144 *Al-Qur’an*, 31:10
146 *Microsoft Encarta Dictionary*, op.cit., s.v. “Isostasy”
2.16 Mathematics

Muslim mathematicians excelled in geometry, as can be seen in their graphic arts. Al-Biruni made a significant contribution towards the establishment of trigonometry as a distinct branch of mathematics. He also excelled in the fields of historiography, geology and mineralogy. Other Muslim mathematicians made significant progress in the classification of mathematical numbers. Algorithms, the processes of mathematics and computer science, are named after the great Arabic mathematician al-Khwarizmi (d.840 C.E.) Our modern number system is called Hindu-Arabic in recognition of its origins in the number systems of India and Arabia. Our number system depends fundamentally on the number 0 (zero) which was invented by Arab mathematicians. A numeral is sometimes called a cipher (hence encipher, decipher) from the Arabic word sifr meaning zero. 147

It is interesting to note that Muslims developed different mathematical concepts under the impact of various Qur’ānic inspirations. The Qur’ān guides in this context as:

O you who believe! When you deal with one another in transactions involving debt for a fixed period of time reduce them to writing. Let a scribe write down faithfully as between the parties; let not the scribe refuse to write as Allah has taught him, so let him write...148

It is prescribed for you that when death approaches any one of you and he leave (some) property behind him then he should bequeath to parents and the near relatives, in an equitable manner. This is an obligation for those who fear Allah.149

There is a share for men in what has been left by parents and nearest relatives and there is a share for women in what has been left by parents and nearest relatives, whether the property be small or large – a fixed share. And if at the time of division other relatives, and orphans and poor are present, give them some thing out of it, and speak kind words.

148 Al-Qur'an, 2:282
149 Ibid., 2:180
People should be afraid that if they had left behind them helpless children what would have been their anxiety about them. So they should fear Allah and speak properly.150

2.17 PLATE TECTONICS

According to the Plate Tectonics theory the outer shell of the earth is made up of thin, rigid plates that move relative to each other. The theory of plate tectonics was formulated during the early 1960s, and it revolutionized the field of geology. Scientists have successfully used it to explain many geological events, such as earthquakes and volcanic eruptions as well as mountain building and the formation of the oceans and continents. Plate tectonics arose from an earlier theory proposed by German scientist Alfred Wegener in 1912. Looking at the shapes of the continents, Wegener found that they fit together like a jigsaw puzzle. Using this observation along with geological evidence he developed the theory of continental drift, which states

150 Ibid., 4:7-9
that today's continents were once joined together into one large landmass.151

A careful perusal of the Qur'an and the Ahadith of Prophet Muhammad (S.A.W.S) lead us to this assertion that one of the most obvious features of Doomsday is that the Earth will be convulsed with a series of earthquakes, followed by one another and at last by one mighty earthquake the like of which has never been seen or heard before. The final earthquake that would heralds the Doomsday, where the earth will suffer mighty convulsions and vibrations, this would results up in the breaking of the Earth's crust into fragments and it will destroy all physiographical features including mountains. The earth like a pregnant mother will throw up her burdens within and outside herself. This would probably mean that all volcanoes both dormant and active would burst over with internal molten lava gushing from everywhere. The Qur'an visualizes the terrible scene with the following verse:

إِذَا زُلْجَتِ الْأَرْضُ زُلْجَتْ أَرْضُ أَقْرَأَهَا (سَوْرَةُ الْوَلَالَةَ)

"When the earth will be shaken with utmost force. And the earth will throw up her burden"152 [from within its core].

The description of the earth being “shaken with utmost force” is understood to indicate a continuous series of earthquakes, preceding the final one. These earthquakes could be of severe magnitude. With

\[151\text{Microsoft Encarta Reference Library, op.cit., s.v. "plate tectonics"}
\]

\[152\text{Al-Qur'an, 99:1-2} \]
the present scientific knowledge we know, that the earthquakes measuring about eight on the Richter scale to be catastrophic. Anything over and above this would turn cataclysmic. This in turn would trigger up large-scale volcanic activity, with the earth's crust opened up, and fragmented.

The verse “throw up her burden (from within)” would suggest that the volcanoes will unleash a terrible heat from its molten lava, which will be almost everywhere, leaving behind a trail of death and destruction. To add to this confusion there may be a rain of volcanic ashes and dust. These volcanic rains may bury many forms of life, destroy vegetation, dry up rivers, may melt up hills and mountains, and make then oceans boil over. To sum up, utter chaos would reign everywhere.

The worse would be, yet to follow. The Qur'ān affirms that there could be loud, thunderous noise everywhere, adding to the terror of those left alive. We know by now, that these earthquakes, volcanoes, vibrations and upheavals in the earth are caused by movement of tectonic plates. The Qur'ān refers to the further destruction in these words:

\[
\text{کَلَّا إِذَا ذَكَّتِ الْأَرْضُ دَكَّاً دَكَّاً (سَوْرَةُ الفَحْر)}
\]

“Nay! When the earth is pounded to flatness.”\textsuperscript{153}

Here the verse clearly draws an allusion to the tectonic plates, which after unleashing death and destruction through volcanoes and

\textsuperscript{153} I\textit{bid.}, 89:21
earthquakes, by grinding against one another, the mountains will break and will be scattered into dust, and will become like clouds of carded wool. The plates will keep on grinding at a faster rate until such time that the earth and everything in it is grounded to atoms. This will sound the final curtain call heralding the end of this earth.

The scientists describe the violent activity to be the result of an "awesome force" that is at work beneath the crust of the earth.\textsuperscript{154} The Qur'\textsuperscript{\textregistered}an mentions:

\begin{quote}
Soon, We shall show them Our signs in the horizons and in their own souls, until it will be manifest to them that it \textit{[Qur'an]} is the Truth...\textsuperscript{155}
\end{quote}

But many among the scientists may fail to appreciate that this awesome force at work is from Allah. He gives life and death and will again make the human beings rise up on the day of Judgment in accordance with His Will.

\begin{quote}
And it is He who has given you life, and He causes you to die and will make you live again. Surely man is ungrateful.\textsuperscript{156}
\end{quote}

\textsuperscript{154} www.najaco.com, s.v. "plate tectonics"

\textsuperscript{155} Al-Qur'an, 41:53

\textsuperscript{156} Ibid., 22:66
2.18 MASS EXTINCTIONS

Extinction is a natural process. As the planet's surface and climate have changed over the 4.6 billion years of its existence, species have disappeared and new ones have evolved to take their place.

Each year, a relatively small number of species become extinct naturally, a phenomenon called the natural, or background rate of extinction. But fossils and other evidence indicate that there have been several periods when the earth’s biodiversity was drastically reduced by mass extinctions in which large number of species became extinct each year. Evidence also support this fact that these mass extinctions were followed by other periods called radiations, when the diversity
increased and spread over several million years. Most scientists agree that life on earth is now subjected to most severe extinction. However, scientists lack the perfection of knowledge about the exact number of exist and extinct species. Estimates vary, but the most widely accepted figure lies between 10 and 13 million species. Of these, biologists estimate that as many as 27,000 species are becoming extinct each year. This points towards extinction of approximately 3 species per hour.

The Qur'an makes reference to this fact that Allah's omnipotence encompasses the power of replacement or extinction of any species.

"Do you not see that Allah has created the heavens and the earth with truth? If He will, He can remove you and bring in a new creation. And that is no great matter for Allah." 

This verse of the Holy Qur'an is a clear Sign to those paleontologists and other scientists that what has been discovered by

---


158 Microsoft Encarta Reference Library, op. cit., s.v. “The current extinction crisis”

159 Al-Qur’an, 14:19-20. The last part of the verse “and that is no great matter for Allah” suggests that Allah (S.W.T.) did away with entire creations in the past. Such as Dinosaurs which flourished before the Cretaceous Period. They were wiped out without leaving a trace of them behind. The appearance of Birds and Mammals, a totally new creation to replace them as found from the fossil records, suggests that such extinctions have been caused by Allah in the past and He has replaced them with new and better creations of His choice. If He so wishes, then he can do away with all mankind and replace them with a new creation. This suggests that human beings as a whole stand helpless before the Will of Allah, if He were to decide on this course of action.
them from the fossil record is true. It also tells them not to be puzzled by new species of animals found in the subsequent strata of sediments as Allah created them all, as he had created the animals before them, and to totally abandon their mindless debates, endless seminars, concocting fanciful stories and hypotheses arising from totally a product of their futile imaginations, and acknowledge that Allah, alone is worthy to be worshipped.

2.19 THE ORIGIN OF LIFE

Scientists opine that life appears to have originated in the oceans about four billion years ago, probably from chemical reactions of molecules such as water, carbon dioxide, and methane. The first life forms for which there is fossil evidence are prokaryotes, one-celled organisms. These organisms lacked a nucleus and reproduced only by cell division. Today's bacteria and cyanobacteria (often called blue-green algae) are descendants of these Archean ancestors. They further assert that water is the living component of all living cells. Without water, life is not possible. When the possibility of life on another planet is discussed, the first question emerges is that; is there a sufficient quantity of water to support life? The Qur'an provides this information in following verses:

---

160 Microsoft Encarta Reference Library, op.cit., s.v. "Origin of Life"
“Have not the disbelievers pondered that the heavens and the earth were of one piece, then We separated them and that We made of water every living thing? Will they not then believe?”¹⁶¹

“And Allah has created every animal from water...”¹⁶²

That is water is the origin of life. Whoever or whatever has got life, it was got through water and its existence depends on water.¹⁶³

Further evolutionists hold that living things spontaneously formed themselves from inanimate matter. Evolutionists answer this question by saying that the first organism was a cell that emerged from inanimate matter by chance. According to the theory, at a time when the earth consisted of inanimate rocks, soil, gases and so on, a living organism formed by chance through the effects of wind, rain, and lightning. This evolutionary claim, however, is contrary to one of the most fundamental rules of biology: Life comes only from life, which means that inanimate matter cannot generate life.

¹⁶¹ _Al-Qur'an_, 21:30.
¹⁶² _Ibid._, 24:45
¹⁶³ Shams Pirzada, _op.cit._, vol 2, p.1075.
The belief that inanimate matter can produce life is actually a medieval superstition. According to this theory, called "spontaneous generation", it was believed that mice sprang naturally from wheat, or maggots arose "spontaneously" from meat. At the time when Darwin put forward his theory, the belief that microbes of their own accord formed themselves from inanimate matter was also very common.

The findings of the French biologist Louis Pasteur put an end to this belief. As he put it: "The claim that inanimate matter can originate life is buried in history for good."164

After Pasteur, evolutionists still maintained that the first living cell formed by chance. However, all experiments and research carried out throughout the 20th century ended in failure. The "chance" formation of a living cell aside, it has not even been possible to produce a living cell by a conscious process in the most advanced laboratories of the world.

Therefore, the question of how the first living organism emerged puts the evolutionary claim into a quandary right at the first step. One of the chief defenders of the theory of evolution at the molecular level, Prof. Jeffrey Bada, makes this confession: "Today as we leave the twentieth century, we still face the biggest unsolved

164 Sidney Fox, Klaus Dose, Molecular Evolution and The Origin of Life, New York: Marcel Dekker, 1977. p. 2
problem that we had when we entered the twentieth century: How did life originate on Earth?"\textsuperscript{165}

While invalidating the theory of evolution, the law “life comes from life” also shows that the first life on earth came again from life, which means that it was created by Allah. He is the only One Who can give life to inanimate matter. In the words of the Qur'an:

\begin{quote}
\textit{بُخْرِجَ الْمَيْتَ مِنَ الْمَيْتِ وَبُخْرِجَ الْمَيْتَ مِنَ الْمَيْتِ وَإِيَّاْيُنَّا الأَرْضُ بَعْدَ مَوْتِهَا وَكَذَّلِكَ لِنَخْرِجُونَ}
\end{quote}

\textit{Qur'an, 30:19.}

“He brings forth the living from the dead, and He brings forth the dead from the living, and He revives the earth after its death. And likewise you will be brought forth.”\textsuperscript{166}

\textsuperscript{165}Jeffrey Bada, "Origins", Earth, February 1998, p. 40

\textsuperscript{166}Al- Qur'an, 30:19.
Space Exploration is a quest to use space travel to discover the nature of the universe beyond Earth. Since ancient times, people have dreamed of leaving their home planet and exploring other worlds. In the later half of the 20th century that dream became reality. The space age began with the launch of the first artificial satellites in 1957. A human being first went into space in 1961. Since then, astronauts and cosmonauts have ventured into space for ever greater lengths of time, even living aboard orbiting space stations for months on end. Two dozen people have circled the Moon or walked on its surface. At the same time, robotic explorers have journeyed where humans could not go, visiting all but one of the solar system's
major worlds. Unpiloted spacecraft have also visited a host of minor bodies such as moons, comets, and asteroids. These explorations have sparked the advance of new technologies, from rockets to communication equipment to computer. Spacecraft studies have yielded a bounty of scientific discoveries about the solar system, the Milky Way Galaxy, and the universe. And they have given humanity a new perspective on earth and its neighbours in space.167

Space exploration step is insignificant compared to the vastness of the universe. Because of the infinite size of the universe there is no possibility for man to explore or go beyond the boundary of the universe. In fact there is no boundary of the universe, Allah says:

"O assemblies of Jinn and men! If you are able to pass out of the borders of the heavens and the earth, them pass out. You can not pass out but with authority. Then which of your Lord's Sign will you deny!"168

This verse has given the indication of the vastness of the universe and limited ability of man. The sun, moon, stars and other objects are created by Allah for the benefit of man, as gifts from

167 Microsoft Encarta Reference Library, op.cit., s.v. "Space exploration"
168 Al-Qur’an, 55:33-34.
Him. They may be studied within man’s limitations and may be
made useful in many ways. Allah has not put any condition or
hindrance in studying the objects of the sky.

وَسَخَّرَ لَكُمُ اللَّيْلَ وَالَّيْلَ وَالشَّمْسَ وَالْقَمَرَ وَالْكُلُّ مُسَخَّرَاتٍ بَاعِرَةٌ إِنَّ فِي ذَلِكَ لآياتٍ لقومٍ

“And for you He has subjected the night and the day, and the sun
and the moon to be of service, and the stars are also subjected in
service by His command. Verily, herein are signs for the people who
have sense.”169

In the above verse, the words “and for you He has subjected”
and “who have sense” are worthy of notice. Man may be more
benefited from the heavenly objects on study, reflection and
applying knowledge gathered from such studies.

---

169Ibid., 16:12.
2.21 Embryology

The *Qur'ān* is replete with the verses regarding the formation of human embryo and foetus. A brief outline of human development in the womb as modern science understands it is:

1. An unfertilized egg is produced by the female, and is subsequently placed in her Fallopian tubes.
2. The male cohabits with the female, and normally a single sperm cell fertilizes the egg.
3. The fertilized egg retreats into the uterus, and attaches itself to the uterine wall.
4. Embryological growth (roughly 3 months).
5. Foetal growth (6 months).
6. Birth
A general overview of human development given in the Qur'ān is:

When He has created you causing you to pass through various stages.”

Allah created [you] from dust, then from sperm-drop...

The first verse provides broader guidelines about the formation of an embryo in different stages. The second verse puts some perspective on the whole affair. How man originally came from dust (Adam), and then from a drop? There are at least four specific details regarding human development in the Qur'ān which modern science has revealed only within the last few centuries and in some cases only in this present century. The first concerns the emission of semen:

Was he not a drop of semen which is dropped (in the womb)

The second important detail in the Qur'ān on human development is the description of the fertilizing semen:

---

170 Ibid., 71:14.
171 Ibid., 35:11.
172 Ibid., 75:37.
“He [man] is created from a gushing fluid.”173

إِنَّا خَلَقْنَا الإِنْسَانَ مِنْ نَفْخَةٍ أَشْهَاءٍ (سُورَةُ الْإِنْسَانَ)

“We created man from a sperm mixed...” 174

ْيَمْ جِعلَ نَسلَةً مِن سَلالَةٍ مِن مَاءٌ مَهْيَيْنِ (سُورَةُ الْصَّدَادَةِ)

“Then He made his breed from the essence of the despised fluid.”175

The second and third verses relate to the contents of semen. Modern science has established that semen is in fact a composition of different secretions which come from four different glands during ejaculation viz the testicles, the seminal vesicles, the prostate gland, and the urinary tract glands. The actual sperm cells come from the testicles; the other three glands produce no fertilizing agents.176 The Qur’ān goes farther than just informing us that semen is a mixture of liquids. It tells that only the “essence” of the liquid is used (the "despised" comes from the fact that semen is emitted from the same place as urine, and thus may be despicable in some people’s sight). The Arabic word for “essence” in this verse signifies

173 Ibid., 86:6.
174 Ibid., 76:2
175 Ibid., 32:8
176 N.P.O. Green (et.al), op.cit., p.752-753.
extracting the absolute best out of something. The numbers tell the story: a normal ejaculation involves about 3 ml of fluid containing between 120,000,000 and 150,000,000 sperm cells. Of these cells, only one fertilizes the egg in the female, and this is the point which the Qur'an (32:8) alludes to.

A third detail of human development mentioned in the Qur'an concerns the newly fertilized egg:

"Was he not a drop of semen which is dropped (in the womb) Then he became a clot, then (Allah) formed his body and put it in order".

Recent observations of the fertilized egg in the womb have revealed that the egg literally implants itself into the uterine wall. It clings (clots) in the strongest sense, and it remains like so in the early stage of development. On top of that, the developing organism acts as a leech on the female host in the sense that it draws its sustenance directly from its mother's body.

---

177 Ibrahim Mustafa, Al Mu'jamu Al Wasit (Arabic Dictionary), Istambol Turkey, Al Maktab Al Islamiya, 1972, vol.1, p.440-441.
178 Al Qur'an, 75:37-38.
The Qur’an gives at another place an account of embryological development (the first three months) in the following verses:

"Alaqah — leech-like structure, Mudghah — chewed-like substance, Idbm — flesh, muscles, Lahm — flesh, muscles"...

Verse 14 of chapter 23 divides embryological development into four stages. The first stage picks up right after fertilization “drop”, and is characterized by an Alaqah or “leech-like structure” which describes how the egg implants itself into the uterus.

The second stage describes the embryo as evolving into a Mudghah which means something which has been chewed (especially a piece of meat), or which has the appearance of having been

180 Al-Qur’an, 23:14
181 Al-Qur’an, 22:5
chewed. This seemingly crude description is in fact quite accurate. After the fertilized egg lodges itself in the uterus, it begins to receive its first nutrients and energy from its mother. Consequently, it begins to grow rapidly, and after a week or two it looks like a ragged piece of meat to the naked eye. This effect is enhanced by the development of small buds and protrusions which will eventually grow into complete organs and limbs.

In next two stages, bones are being made from the Mudghah, followed by the “clothing” of the bones with flesh or muscles. After approximately four weeks, a process called ‘differentiation’ begins, where groups of cells within the embryo transform themselves to form certain large organs. One of the earliest structures to develop in this stage is the cartilaginous basis of the human skeleton (in subsequent months, the cartilage hardens or ossifies). It is followed soon after by the appearance of a host of other organs including muscles, ears, eyes, kidneys, heart, and more.\textsuperscript{182} This maintains the order described in the Qur'an. The verse (23:14) concludes with the growth of the organism in the womb followed by its birth.

\textsuperscript{182}Microsoft Encarta Reference Library, op.cit., s.v. “Embryology”
2.22 Cupping and microsurgery

“There is healing in cupping.”¹⁸³ This tradition of Prophet Muhammad (S.A.W.S) has been safely preserved by our scholars in different books written on Hadith. This tradition of the Prophet finds a mention in Sahih Al-Bukhari, Tirmidhi and the Sunan Abu Da'ud.

Cupping as it was then called used to be practiced during the time of Prophet Muhammad (S.A.W.S) as a cure for certain medical problems. Usually puncture like incisions would be made on different sites of the body or the places infected in the body by a

professional "cupper", whose services were hired for this purpose, and after making one or more incisions the cupper would then proceed to suck blood from these sites using his mouth and spit out the blood that had been sucked. In another way of cupping, leeches were attached on the infected areas to suck the blood or eat putrid flesh.

With the advancements of Modern medicine and the rapid studies made in the advancements of Modern surgery, this method of treatment was discarded except for a few Unani Hakims who still practice it even today in India. In modern medicine this system of cupping is still visible but in a changed way. When a Pathologist drawing blood from a patient intravenously and tests that in a laboratory for any possible infection, he is actually practicing cupping of the olden times.

If a healthy person comes forward to donate blood for some person who is in need of it, then this process can be also classified under cupping, as blood is drawn out of the body using a syringe. Nowadays cupping glasses are being used to increase the blood

---

184 The cupper was usually paid handsomely for the services rendered. This job was considered dangerous because there was every chance of the cupper ending up as a victim of some infection or the other.

185 www.njao.co.com, s.v. "cupping"

186 Leech is a fresh blood sucking water worm that sucks blood or eats putrid flesh. On such species (class: Hirudinea) has been used in medical treatments to bleed patients or to away putrid flesh from a wound.
supply in the tissues below.\textsuperscript{187} In short, if a reasonable quantity of blood is drawn from the body by using any other device or method then this process can also be classified under the subject cupping.

In modern microsurgery this method has found its place and recently scientific findings strongly recommended this method. The Journal of the \textit{Norwegian Medical Association} recently published an experimental study about an unusual story of Leeches used in microsurgery to prevent harmful swellings in replanted body parts. Earlier to this the \textit{British Medical Journal} had carried out a similar study on the use of Leeches in modern microsurgery in the year 1994.

It is really tragic that we now need the western scientists to certify a cure in "Cupping" through Leeches, which our Prophet (S.A.W.S) not only practiced, but also suggested to others that one can safely look for a cure and a certain treatment for it for certain medical conditions and a cure can be sought through the method especially in cases of clotted or congealed blood.\textsuperscript{188}

\textsuperscript{187} The cupping glass is a glass container in which a partial vacuum is created by heat or suction that is applied to the skin.

\textsuperscript{188} \url{www.najiaco.com}, s.v. "Cupping". Islam is a religion which was revealed by Allah (Subhanahu wa Ta’ala) through Prophet Muhammad(SallAllahu ‘alaihi wa Sallam) and has been preserved intact in the Holy Quran and the Hadith literature carefully and honestly compiled by different Scholars painstakingly in their books on Traditions, which has been the exclusive property of Muslims for 1400 years. The Muslim community around the world as a whole needed the services of Dr Maurice Bucaille and Dr Keith Moore, one an European and the latter a western scientist to announce to the World that both the Quran and the Hadith literature withstood both scientific scrutiny and the test of time. The Muslim scholars along with scientists should conduct, orient,
2.23 Early embryonic period

The Prophet Muhammad, (SallAllahu ‘alaihi Wasallam), has informed us in a Hadith that: “In every one of you, all components of your creation are gathered together in your mothers’ womb by 40 days”. In another Hadith, Prophet Muhammad (S.A.W.S) imparts this awakening that when forty-two nights have passed over the drop (nutfah), Allah (Subhanahu wa Ta ‘alā) sends an angel to it, who shapes it and makes its ears, eyes, skin, flesh and bones. Then he says, “O Lord is it male or female?” and your Lord decides what he wishes.

It follows that there is no conflict between genetics and Islam, but in fact Ahadith can guide science. The first 40 days constitute a clearly distinguishable stage of embryogenesis. This shows the absolute precision and accuracy of these Ahadith with modern science.

and redouble their efforts on Islamic lines, and try to present Islam in a positive light both to Muslims as well as non-Muslims all over the world.

189Abu Abdullah Muhammad bin Isma’il Al-Bukhari, op.cit., vol.4, Hadith no. 430.
190Al Hajjaj bin Muslim, Sahih Muslim, Riyadh, Saudi Arabia, Daru ibn al Jawzi, 2002, Hadith no.1216.
2.24 Information Technology revolution

The Prophet Muhammad (S.A.W.S), more than 1400 years ago, pronounced number of predictions concerning the day of Judgment, the signs, warnings, and disasters that would occur shortly before the end of times. From these prophecies can easily be inferred that the events occurring every day are not happening by chance, but are a part of the Creator's overall plan. Abu Sa'id (R.A.) narrates from the Prophet (S.A.W.S): “By Him in Whose hand is my soul, the Hour will not come until wild animals talk to men, and a man speaks to his whip or his shoe, and his thigh will tell him about what happened to his family after he left.”\textsuperscript{191}

If we analyze the second part of the text of the above Hadith, we cannot fail to draw the following conclusions:

There will be unusual ways of communication between people during the end of times. A man will speak into inanimate objects, like a whip or his shoe. His thigh will give him details about his family after he left home.

This Hadith clearly talks about futuristic telecommunication devices into which a man speaks, which could be shaped like a whip. It has been noticed that the marketing of smart shoes fitted with tiny micro transmitters that gives precise information about the location and other details of a person. Other futuristic telecommunication devices that are being contemplated are under the skin-implants that have been implanted and successfully tested to monitor wildlife activity. The technologies for such devices already exist in the market and they are for sale. There are people who have used them with astonishing results and it will be only a matter of time before they are made available for public use.  

2.25 **Cleanliness – Germ infection**

The Prophet Muhammad (S.A.W.S) forbade mixing with dogs, and that he warned against their licking plates and against keeping them without necessity. It is narrated by Abu Hurairah (R.A.) that the

---

Prophet Muhammad (S.A.W.S) said at one of the occasions; “If a dog drinks from one of your containers, wash it seven times.”\textsuperscript{193} There is another Hadith to this effect in \textit{Sahih Muslim}, “Cleanse your containers if a dog licks it by washing it seven times, the first washing being with dirt (sand).”\textsuperscript{194} From the medical point of view the tapeworm carried by dogs is a cause of chronic disease, sometimes resulting in death. This worm is found in man, in cattle, and in pigs, but it is found in fully-developed form only in dogs, wolves and rarely in cats. These worms differ from others in that they are minute and invisible, consequently, they were not discovered until very recently. Biologically, the developmental process of this worm has some unique characteristics. In the lesions caused by them, one worm gives rise to many heads which spread and form other and varied kinds of lesions and abscesses. These heads develop into full-grown worms only in dogs' tonsils. In humans and in other animals they appear as lesions and abscesses completely different from the tapeworm itself. In animals the size of an abscess may reach that of an apple, while the liver of the infected animal may grow from five to ten times its normal size. In human beings the size of the abscess may reach that of a clenched fist or even the head of an infant; it is filled with yellow fluid weighing from ten to twenty pounds. In the infected human it may cause diverse kinds of inflammations in the lungs, muscles, spleen, kidneys, and brain, and appears in such different forms that

\begin{flushright}

\textsuperscript{193}Abu Abdullah Muhammad bin Isma'il Al-Bukhari, \textit{ṣaḥīḥ}, vol.1, Hadith no. 173.

\textsuperscript{194}Al Hajjaj bin Muslim, \textit{ṣaḥīḥ}, Hadith no.128.
\end{flushright}
specialists, until very recently, had difficulty in recognizing it. In any case, wherever this inflammation is found, it poses great danger to the health and life of the patient. What is worse is that, in spite of our knowledge of its life history, origin, and development, we have not been able to devise a cure for it, except that in some instances these parasites die out, possibly because of antibodies produced in the human body. Unfortunately, cases in which such parasites die without causing damage are rare indeed. In any case, wherever this inflammation is found, it poses great danger to the health and life of the patient.  

The best way to combat the problem is to follow the established principle that prevention is better than cure. Thus human beings can protect themselves from this kind of infection by keep a safe distance from dogs. They should not hug them, play with them, or let them come close to children.