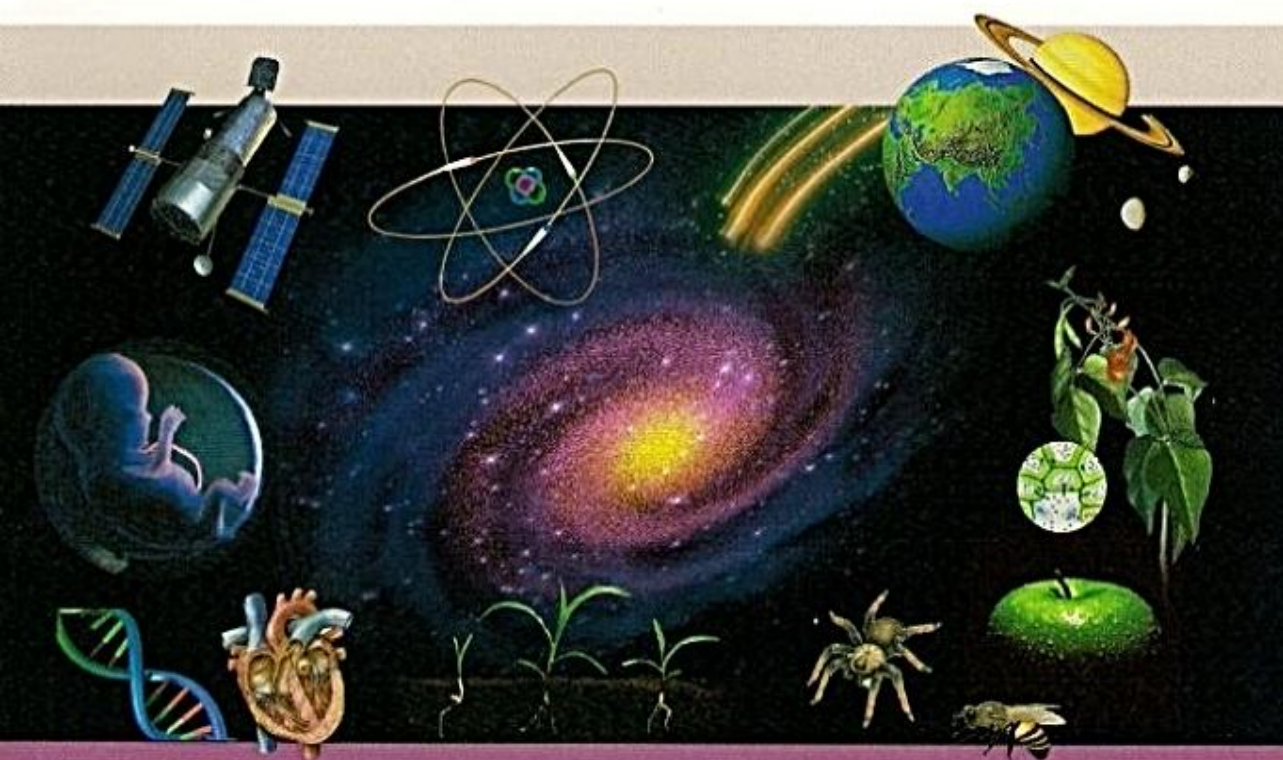


# The Qur'an and Modern Science

Compatible or Incompatible?



By Dr. Zakir Naik

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## **Introduction**

Ever since the dawn of human life on this planet, man has always sought to understand nature, his own place in the scheme of creation and the purpose of life itself. In this quest for Truth, spanning many centuries and diverse civilizations, organized religion has shaped human life and determined, to a large extent, the course of history. While some religions have been based on books, claimed by their adherents to be divinely inspired, others have relied solely on human experience.

The Qur'an, the main source of the Islamic faith, is a book believed by Muslims to be of completely divine origin and that it contains Divine guidance for all humankind. Since the message of the Qur'an is believed to be for all times, it should therefore be relevant to every age. Does the Qur'an pass this test? In this booklet<sup>1</sup>, I intend to give an objective analysis of the Muslim belief regarding the divine origin of the Qur'an, in the light of established scientific discoveries.

There was a time in the history of world civilization when 'miracles', or what was perceived to be miracles, took precedence over human reason and logic. But how do we define the term 'miracle'? A miracle is anything that takes place out of the normal course of life and for which humankind has no explanation. However, we must be careful before we accept something as a miracle. An article in *The Times of India*, Mumbai, published in 1993, reported that 'a saint' by the name 'Baba Pilot' claimed to have stayed

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1. I would like to thank Brother Musaddique Thange for his editorial assistance. May Allah (ﷻ) reward him for his efforts. (Amen)





continuously submerged under water in a tank for three consecutive days and nights.

However, when reporters wanted to examine the base of the tank of water where he claimed to have performed this 'miraculous' feat, he refused to let them do so. He argued by asking how one could possibly examine the womb of a mother that gives birth to a child. In fact the 'Baba' was hiding something. It was a gimmick simply to gain publicity. Surely, no modern man with even the slightest inkling towards rational thinking would accept such a 'miracle'. If such false miracles are the tests of divinity, then we would have to accept Mr. P.C. Sorcar, the world famous magician known for his ingenious magical tricks and illusions, as the best god-man.

A book claiming divine origin is, in effect, claiming to be a miracle. Such a claim should be easily verifiable in any age, according to the standards of that age. Muslims believe that the Qur'an is the last and final revelation of God, the miracle of miracles revealed as a mercy to all mankind. Let us therefore investigate the veracity of this belief.

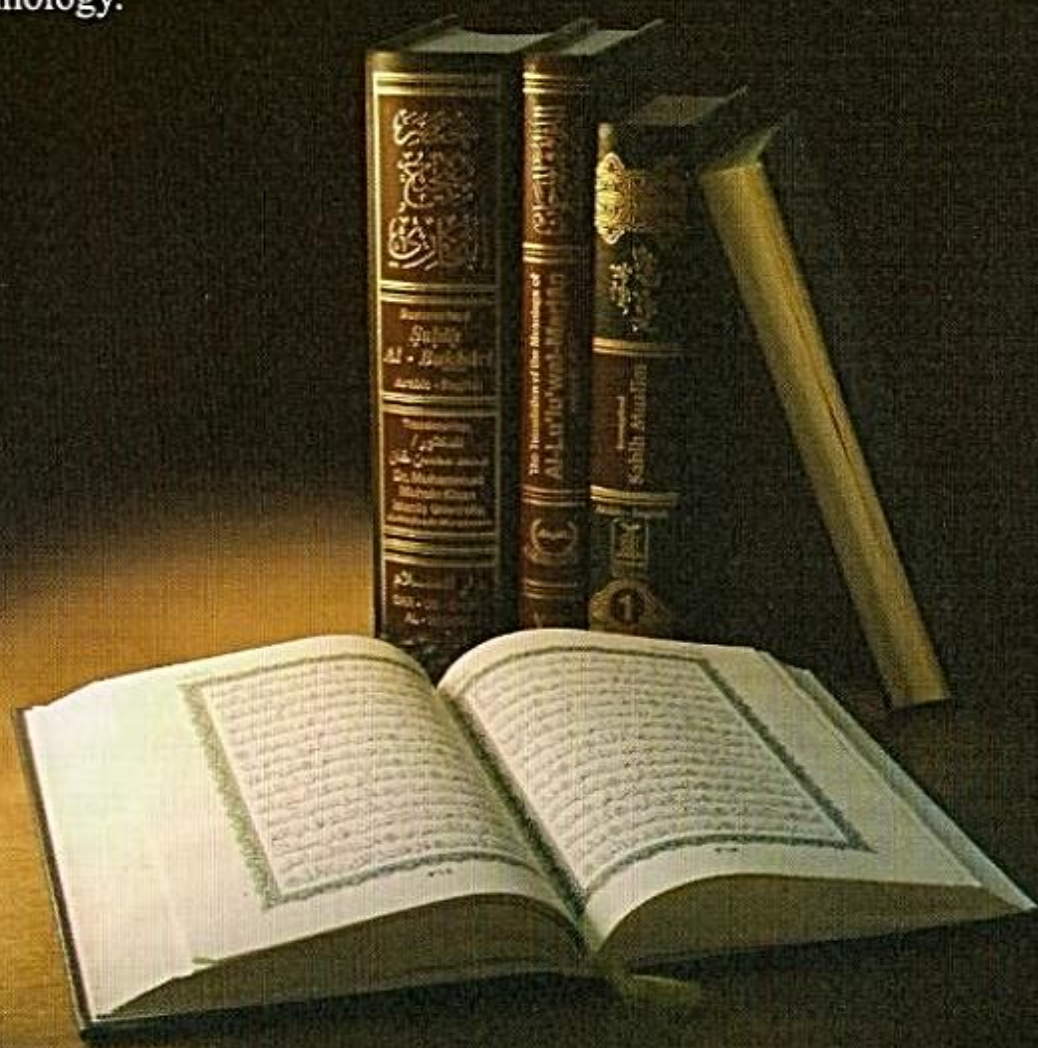


# The Qur'an

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## The Challenge of the Qur'an

Works of literature have been instruments of human expression and creativity in all cultures. The world also witnessed an age when such works of literature occupied pride of position similar to that now enjoyed by science and technology.





Muslims as well as non-Muslims agree that the Qur'an is Arabic literature *par excellence* – that it is the best Arabic literature on the face of the earth. The Qur'an challenges mankind in the following verses:

﴿وَإِنْ كُنْتُمْ فِي رَيْبٍ مِّمَّا نَزَّلْنَا عَلَىٰ عَبْدِنَا فَأْتُوا بِسُورَةٍ مِّثْلِهِ ۚ وَادْعُوا شُهَدَاءَكُمْ مِنْ دُونِ اللَّهِ إِنْ كُنْتُمْ صَادِقِينَ ﴿٢٣﴾ فَإِنْ لَمْ تَفْعَلُوا وَلَنْ تَفْعَلُوا فَأْتُوا النَّارَ الَّتِي وَقُودُهَا النَّاسُ وَالْحِجَارَةُ أُعِدَّتْ لِلْكَافِرِينَ ﴿٢٤﴾﴾

And if you (Arab pagans, Jews, and Christians) are in doubt concerning that which We have send down (i.e. the Qur'an) to Our slave (Muhammad ﷺ), then bring a *surah* (chapter) of the like thereof and call your witnesses (supporters and helpers) besides Allah if you are truthful. But if you do it not, and you can never do it, then fear the Fire (Hell) whose fuel is men and stones, prepared for the disbelievers.. (Qur'an 2:23-24)<sup>1</sup>

The challenge of the Qur'an in this verse is to produce a single *surah* (chapter) like the *surahs* it contains. The same challenge is repeated in the Qur'an several times. The challenge to produce a *surah*, which is at least somewhat similar to a Qur'anic *surah* in beauty, eloquence, depth and meaning, remains unmet to this day.

1. Qur'an 2:23-24 indicates *surah* or chapter No. 2 and *ayat* or verses 23 and 24. The same notation is followed throughout the book. References and translations of the meanings of the Qur'an have been taken from the translation of the meanings of the Holy Qur'an by Abdullah Yusuf Ali, published by King Fahd Holy Qur'an Printing Complex, Al-Madinah, Saudi Arabia, as well as other translations.

A modern rational man, however, would never accept a religious scripture which says, in the best possible poetic language, that the world is flat. This is because we live in an age where human reason, logic and science are given primacy. Not many would accept the Qur'an's extraordinarily beautiful language as proof of its divine origin. Any scripture claiming to be a divine revelation must also be acceptable on the strength of its own reason and logic.

According to the famous physicist and Nobel Prize winner Albert Einstein, "Science without religion is lame. Religion without science is blind." Let us therefore study some verses of the Qur'an and analyze whether the Qur'an and modern science are compatible or incompatible.

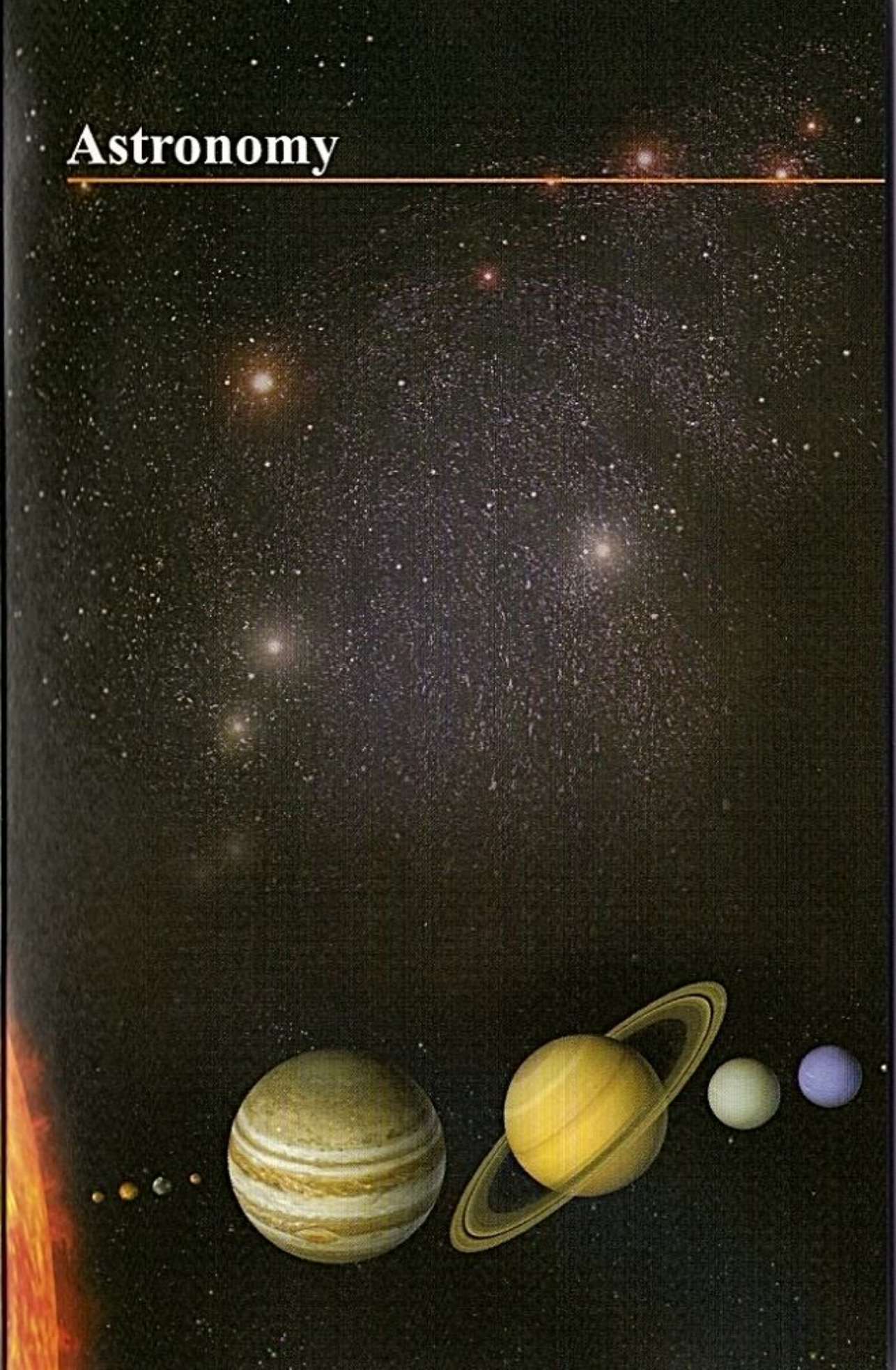
It is worth mentioning here, however, that the Qur'an is not a book of science but a book of 'signs', i.e. *ayats*. There are more than six thousand 'signs' in the Qur'an of which more than a thousand deal with science.

We all know that many a times science takes a 'U-turn'. In this book I have considered only established scientific facts and not mere hypotheses and theories that are based on assumptions and are not backed by conclusive proof.



# Astronomy

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# The Creation of the Universe

## The 'Big Bang'

The creation of the universe is explained by astrophysicists in a widely accepted phenomenon, popularly known as the 'Big Bang'. This theory is supported by observational and experimental data gathered by astronomers and astrophysicists for decades. According to the 'Big Bang theory', the whole universe was initially one big mass (Primary Nebula). Then there was a 'Big Bang' (Secondary Separation) which resulted in the formation of galaxies. These then divided to form stars, planets, the sun and the moon, among other things. The origin of the universe was unique and the probability of its occurring by 'chance' is zero.

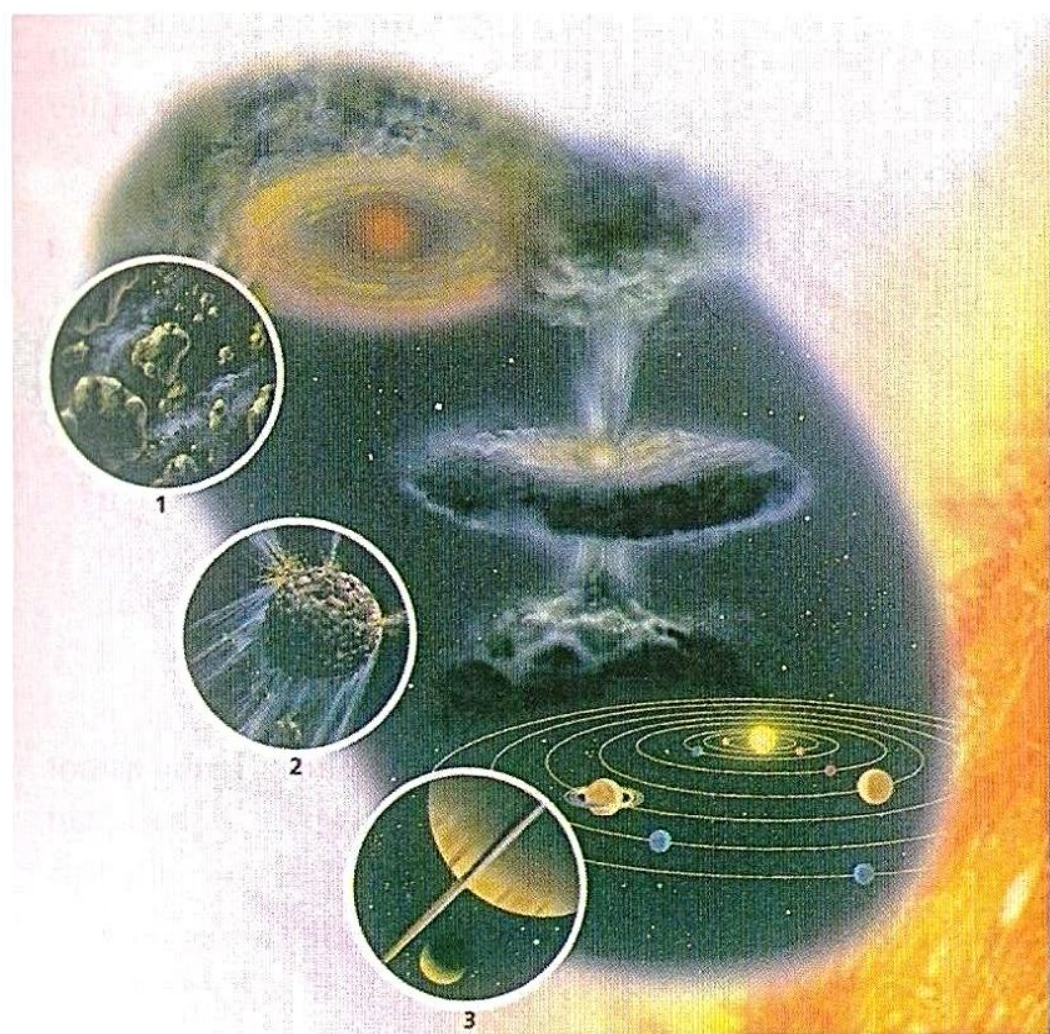
The Qur'an contains the following verse, regarding the origin of the universe:

﴿أَوَلَمْ يَرِ الَّذِينَ كَفَرُوا أَنَّ السَّمَوَاتِ وَالْأَرْضَ كَانَتَا رَتْقًا فَفَتَقْنَاهُمَا﴾

Have those who disbelieve not known that the heavens and the earth were joined together as one united piece, then We parted them? (Qur'an 21:30)



The striking congruence between the Qur'anic verse and the 'Big Bang' is inescapable! How could a book which appeared in the deserts of Arabia more than 1400 years ago contain this profound scientific truth?





## There was an Initial Gaseous Mass before the Creation of Galaxies

Scientists say that before the galaxies in the universe were formed, celestial matter was initially in the form of gaseous matter. In short, huge gaseous matter or clouds were present before the formation of the galaxies. To describe initial celestial matter, the word 'smoke' is more appropriate than gas. The following Qur'anic verse refers to this state of the universe by the word *dukhaan*, which means smoke.

﴿ثُمَّ أَسْتَوَىٰ إِلَى السَّمَاءِ وَهِيَ دُخَانٌ فَقَالَ لَهَا وَلِلْأَرْضِ ائْتِيَا طَوْعًا أَوْ كَرْهًا قَالَتَا  
أَتَيْنَا طَائِعِينَ﴾

Then He (i.e. Allah) rose over towards the heaven when it was smoke, and said to it and to the earth: "Come [into being] both of you willingly or unwillingly." They both said: "We come willingly." (Qur'an 41:11)

Again, this fact is a corollary to the 'Big Bang' and was not known to the Arabs during the time of Prophet Muhammad (ﷺ). What then could have been the source of this knowledge?

## The Spherical Shape of the Earth

In early times people believed that the earth was flat. For centuries, men were afraid to venture out too far, lest they should 'fall off the edge'. Sir Francis Drake was the first person who proved that the earth is spherical when he sailed around it in 1577.

Consider the following Qur'anic verse regarding the alternation of day and night:



﴿أَلَمْ تَرَ أَنَّ اللَّهَ يُولِجُ اللَّيْلَ فِي النَّهَارِ وَيُولِجُ النَّهَارَ فِي اللَّيْلِ﴾

See you not that Allah merges the night into the day (i.e. the decrease in the hours of the night are added to the hours of the day) and merges the day into the night (i.e. the decrease in the hours of the day are added to the hours of the night). (Qur'an 31:29)

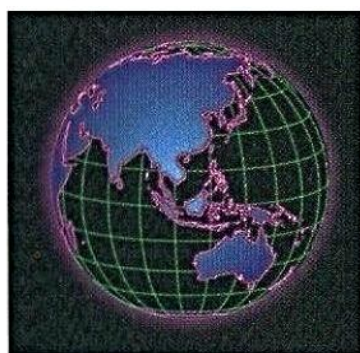
Merging here means that the night slowly and gradually changes to day and vice versa. This phenomenon can only take place if the earth is spherical. If the earth was flat, there would have been a sudden change from night to day and from day to night.

The following verse also alludes to the spherical shape of the earth:

﴿خَلَقَ السَّمَوَاتِ وَالْأَرْضَ بِالْحَقِّ يُكَوِّرُ اللَّيْلَ عَلَى النَّهَارِ وَيُكَوِّرُ النَّهَارَ عَلَى اللَّيْلِ﴾

He has created the heavens and the earth with truth. He makes the night to go in the day and makes the day to go in the night. (Qur'an 39:5)

The Arabic word used here is *kawwara* meaning 'to overlap' or 'to coil' – the way a turban is wound around the head. The overlapping or coiling of the day and night can take place if the earth is spherical.



The earth is not exactly round like a ball, but geo-spherical, i.e., it is flattened at the poles. The following verse contains a description of the earth's shape:

﴿وَالْأَرْضَ بَعْدَ ذَلِكَ دَحَاهَا﴾

And after that He spread the earth. (Qur'an 79:30)

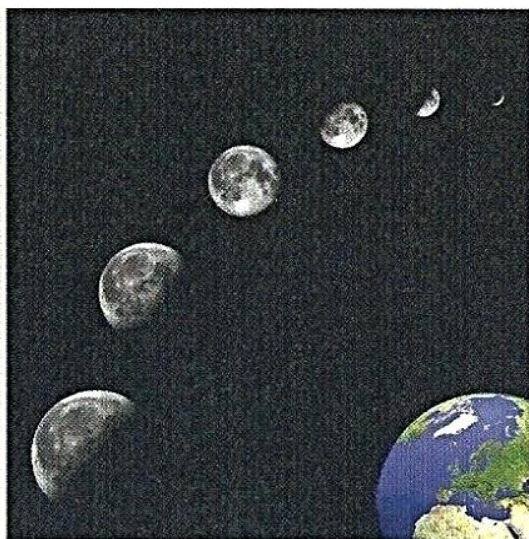


The Arabic word for egg here is *Dahaahaa*<sup>1</sup> which means an ostrich-egg. The shape of an ostrich-egg resembles the geospherical shape of the earth.

Thus the Qur'an correctly describes the shape of the earth, though the prevalent notion when the Qur'an was revealed was that the earth was flat.

## The Light of the Moon is Reflected Light

It was believed by earlier civilizations that the moon emanates its own light. Science now tells us that the light of the moon is reflected light. However this fact was mentioned in the Qur'an more than 1,400 years ago in the following verse:



﴿نَبَارَكُ الَّذِي جَعَلَ فِي السَّمَاءِ بُرُوجًا وَجَعَلَ فِيهَا سِرَاجًا وَقَمَرًا مُنِيرًا﴾

Blessed is He (Allah) Who has placed in the heaven big stars, and has placed therein a great lamp (sun), and a moon giving light. (Qur'an 25:61)

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1. The Arabic word *dahaahaa* has been translated by A. Yusuf Ali as 'vast expanse', which is also correct. The word *dahaahaa* also means an ostrich-egg.

The Arabic word for the sun in the Qur'an is *shams*. It is referred to as *siraaj* which means a 'torch' or as *wahhaaj* which means 'a blazing lamp' or as *dhiyyaa* which means 'shining glory'. All three descriptions are appropriate to the sun, since it generates intense heat and light by its internal combustion. The Arabic word for the moon is *qamar* and it is described in the Qur'an as *muneer*, which is a body that gives *noor*, i.e., light. Again, the Qur'anic description perfectly matches the true nature of the moon which does not give off light itself and is an inert body that reflects the light of the sun. Not once in the Qur'an is the moon mentioned as *siraaj*, *wahhaaj* or *dhiyyaa* or the sun as *noor* or *muneer*. This implies that the Qur'an recognizes the difference between the nature of sunlight and moonlight.

Consider the following verses related to the nature of light from the sun and the moon:

﴿هُوَ الَّذِي جَعَلَ الشَّمْسُ ضِيَاءً وَالْقَمَرَ نُورًا﴾

It is He who made the sun a shining light and the moon a [derived] light. (Qur'an 10:5)

﴿الَّذِينَ تَرَوْنَ كَيْفَ خَلَقَ اللَّهُ سَبْعَ سَمَوَاتٍ طِبَاقًا ۚ وَجَعَلَ الْقَمَرَ فِيهِنَّ نُورًا وَجَعَلَ

الشَّمْسَ سِرَاجًا ۚ﴾

“See you not how Allah has created the seven heavens one above another, and made the moon a light in their midst, and made the sun as a [glorious] lamp? (Qur'an 71:15-16)

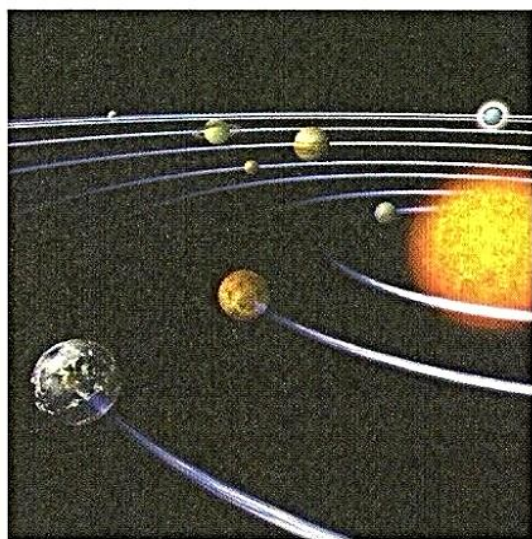


## The Sun Rotates

For a long time European philosophers and scientists believed that the earth stood still in the centre of the universe and that 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 BC. In 1512, Nicholas Copernicus put forward his Heliocentric Theory of Planetary Motion, which asserted that the sun is motionless at the centre of the solar system with the planets revolving around it.

In 1609, the German scientist Johannes Kepler published the *Astronomia Nova* in which he concluded that not only do the planets move in elliptical orbits around the sun but that 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 was stationary and did not rotate about its axis like the earth. I remember having studied this fallacy in geography books during my school days.





Consider the following Qur'anic verse:

﴿وَهُوَ الَّذِي خَلَقَ اللَّيْلَ وَالنَّهَارَ وَالشَّمْسَ وَالْقَمَرَ كُلٌّ فِي فَلَكٍ يَسْبَحُونَ﴾

And He it is Who has created the night and the day and the sun and the moon, each in an orbit floating. (Qur'an 21:33)

The Arabic word used in the above verse is *yasbahoon*. The word *yasbahoon* is derived from the word *sabaha* which carries with it the idea of motion that comes from any moving body. If you use the word for a man on the ground, it would not mean that he is rolling but rather is walking or running. If you use the word for a man in water it would not mean that he is floating but rather swimming.

Similarly, if you use the word *yasbahu* for a celestial body such as the sun it would not only mean that it is flying through space but also rotating as it goes through space. Most school textbooks have 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 table top so that one can examine the image of the sun without being blinded. 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 around its axis.

In fact, the sun travels through space at roughly 150 miles per second and takes about 200 million years to complete one revolution around the centre of our Milky Way Galaxy.

The Qur'an also says:

﴿لَا الشَّمْسُ يَنْبَغِي لَهَا أَنْ تُدْرِكَ الْقَمَرَ وَلَا اللَّيْلُ سَابِقُ النَّهَارِ وَكُلٌّ فِي فَلَكٍ  
يَسْبَحُونَ﴾

It is not for the sun to overtake the moon, nor does the night outstrip the day. They all float, each in an orbit. (Qur'an 36:40)

This verse mentions an essential fact discovered by modern astronomy, i.e., the existence of the individual orbits of the sun and the moon and their journey through space with their own motion.

The 'fixed place' towards which the sun travels, carrying with it the solar system, has been located exactly by modern astronomy. It has been given a name, the Solar Apex. The solar system is indeed moving in space towards a point situated in the constellation of Hercules (alpha Lyrae) whose exact location is firmly established.

The moon rotates around its axis in the same duration that it takes to revolve around the earth. It takes approximately 29½ days to complete one rotation.

One cannot help but be amazed at the scientific accuracy of the Qur'anic verses. Should we not ponder over the question: "What is the source of knowledge contained in the Qur'an?"



## The Sun will Extinguish after a Certain Period

The light of the sun is due to a chemical process on its surface that has been taking place continuously for the past five billion years. It will come to an end at some point of time in the future when the sun will be totally extinguished, leading to the extinction of all life on earth. Regarding the impermanence of the sun's existence, the Qur'an says:

﴿وَالشَّمْسُ تَجْرِي لِمُسْتَقَرٍّ لَّهَا ذَٰلِكَ تَقْدِيرُ الْعَزِيزِ الْعَلِيمِ﴾

And the sun runs on its fixed course for a term [appointed]. That is the Decree of the All-Mighty, the All-Knowing<sup>1</sup>. (Qur'an 36:38)

The Arabic word used here is *mustaqarr*, which means a place or time that is determined. Thus the Qur'an says that the sun runs towards a determined place and will do so only up to a pre-determined period of time. This means that it will end or extinguish.



1. A similar message is conveyed in the Qur'an in 13:2, 35:13, 39:5 and 31:29.

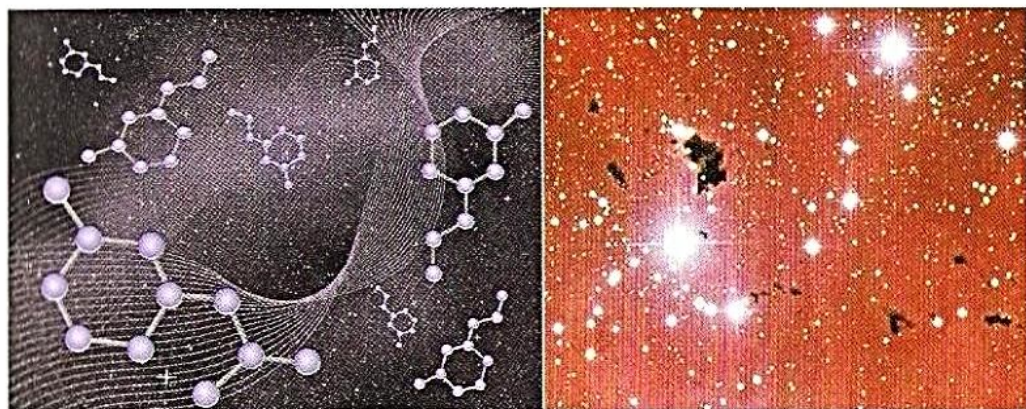
## The Presence of Interstellar Matter

Space outside organized astronomical systems was earlier assumed to be a vacuum. Astrophysicists later discovered the presence of bridges of matter in this interstellar space. These bridges of matter are called plasma and consist of completely ionized gas containing an equal number of free electrons and positive ions. Plasma is sometimes called the fourth state of matter (besides the three known states, viz., solid, liquid and gas). The Qur'an mentions the presence of this interstellar material in the following verse:

﴿الَّذِي خَلَقَ السَّمَوَاتِ وَالْأَرْضَ وَمَا بَيْنَهُمَا﴾

Who created the heavens and the earth and all that is between them. (Qur'an 25:59)

It would be ridiculous for anybody to even suggest that the presence of interstellar galactic material was known more than 1400 years ago.





## The Expanding Universe

In 1925, an American astronomer by the name of Edwin Hubble provided observational evidence that all galaxies are receding from one another, which implies that the universe is expanding. The expansion of the universe is now an established scientific fact. This is exactly what the Qur'an says regarding the nature of the universe:

﴿وَالسَّمَاءَ بَنَيْنَاهَا بِأَيْدٍ وَإِنَّا لَمُوسِعُونَ﴾

With power did We construct the heaven. Verily, We are Able to extend the vastness of space thereof. (Qur'an 51:47)

The Arabic word *moosi'oom* is correctly translated as 'expanding it', and it refers to the creation of the expanding vastness of the universe.

In his book *A Brief History of Time*, Stephen Hawking says, "The discovery that the universe is expanding was one of the great intellectual revolutions of the 20th century." The Qur'an mentioned the expansion of the universe before man even learnt how to build a telescope!

Some may say that the presence of astronomical facts in the Qur'an is not surprising since the Arabs were advanced in the field of astronomy. They are correct in acknowledging the advancement of the Arabs in the field of astronomy.

However they fail to realize that the Qur'an was revealed centuries before the Arabs excelled in astronomy. Moreover, many of the scientific facts mentioned above regarding astronomy, such as the origin of the universe with a Big Bang, were not known to the Arabs even at the peak of their scientific advancement. The scientific facts mentioned in the Qur'an are therefore not due to the Arabs' advancement in astronomy. Indeed, the reverse is true. The Arabs advanced in astronomy because astronomy occupies a place in the Qur'an.



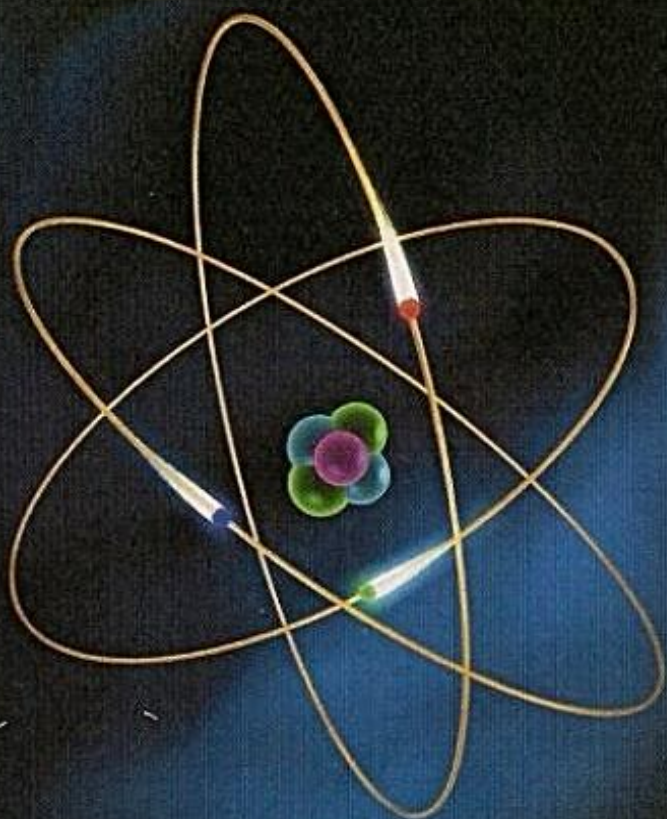


# Physics

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## The Existence of Subatomic Particles

In ancient times a well-known theory known as the ‘Theory of Atomism’ was widely accepted. This theory was originally proposed by the Greeks, in particular by a man called Democritus who lived about 23 centuries ago. Democritus and the people that came after him assumed that the smallest unit of matter was the atom. The Arabs used to believe the same. The Arabic word *dharrah* most commonly meant an atom.



In recent times modern science has discovered that it is possible to split even an atom. That the atom can be split further is a development of the 20th century. More than fourteen centuries ago this concept would have appeared unusual even to an Arab. For him the *dharrah*, or atom, was the limit beyond which one could not go any further. The following Qur'anic verse however, refuses to acknowledge

﴿وَقَالَ الَّذِينَ كَفَرُوا لَا تَأْتِينَا السَّاعَةُ قُلْ بَلَىٰ وَرَبِّي لَتَأْتِيَنَّكُمْ عَالِمِ الْغَيْبِ  
لَا يَعْزُبُ عَنْهُ مِثْقَالُ ذَرَّةٍ فِي السَّمَوَاتِ وَلَا فِي الْأَرْضِ وَلَا أَصْغَرُ مِنْ  
ذَٰلِكَ وَلَا أَكْبَرُ إِلَّا فِي كِتَابٍ مُّبِينٍ﴾

Those who disbelieve say: “The Hour will not come to us.” Say: “Yes, by my Lord, the All-Knower of the Unseen, it will come to you; not even the weight of an atom or less than that or greater escapes His Knowledge in the heavens or in the earth but it is in a Clear Book (*Al-Lauh Al-Mahfoodh*).”<sup>1</sup>  
(Qur'an 34:3)

This verse refers to the Omniscience of God, His knowledge of all things, hidden or apparent. It then goes further and says that God is aware of everything, including what is smaller or bigger than the atom. Thus the verse clearly shows that it is possible for something smaller than the atom to exist, a fact discovered only recently by modern science.

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1. A similar message is conveyed in the Qur'an in 10:61.



# Geography

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## The Water Cycle

In 1580, Bernard Palissy was the first man to describe the present-day concept of 'water cycle'. He described how water evaporates from the oceans and cools to form clouds. The clouds move inland where they rise, condense and fall as rain. This water gathers as lakes and streams and flows back to the ocean in a continuous cycle. In the 7th century BC, Thales of Miletus believed that the surface spray of the oceans was picked up by the wind and carried inland to fall as rain!





In earlier times people did not know the source of underground water. They thought the water of the oceans, under the effect of winds, was thrust towards the interior of the continents. They also believed that the water returned by a secret passage, or the Great Abyss. This passage is connected to the oceans and has been called the 'Tartarus' since Plato's time. Even Descartes, a great thinker of the eighteenth century, subscribed to this view. Until the nineteenth century, Aristotle's theory had been prevalent. According to this theory, water was condensed in cool mountain caverns and formed underground lakes that fed springs. Today, we know that the rain water that seeps into the cracks of the ground is responsible for this.

The water cycle is described by the Qur'an in the following verses:

﴿ أَلَمْ تَرَ أَنَّ اللَّهَ أَنْزَلَ مِنَ السَّمَاءِ مَاءً فَسَلَكَهُ يَنْبِيعٌ فِي الْأَرْضِ ثُمَّ يُخْرِجُ بِهِ زَرْعًا مُخْتَلِفًا أَلْوَانُهُ ﴾





See you not that Allah sends down water (rain) from the sky and causes it to penetrate the earth, [and then makes it to spring up] as water springs, and afterward thereby produces crops of different colours. (Qur'an 39:21)

﴿وَيُنَزِّلُ مِنَ السَّمَاءِ مَاءً فَيُخْجِي بِهِ الْأَرْضَ بَعْدَ مَوْتِهَا إِنَّ فِي ذَلِكَ لَآيَاتٍ لِّقَوْمٍ يَعْقِلُونَ﴾

He sends down water (rain) from the sky, and therewith revives the earth after its death. Verily, in that are indeed signs for a people who understand. (Qur'an 30:24)

﴿وَأَنْزَلْنَا مِنَ السَّمَاءِ مَاءً بِقَدَرٍ فَأَسْكَنَهُ فِي الْأَرْضِ وَإِنَّا عَلَى ذَهَابٍ بِهِ لَقَادِرُونَ﴾

And We send down from the sky water (rain) in [due] measure, and We gave it lodging in the earth, and verily, We are able to take it away. (Qur'an 23:18)

No other text dating back over 1400 years ago gives such an accurate description of the water cycle.



## Winds Impregnate the Clouds

﴿وَأَرْسَلْنَا الرِّيحَ لَوْفِحَ فَأَنْزَلْنَا مِنَ السَّمَاءِ مَاءً فَأَسْقَيْنَاكُمُوهُ﴾

And We send the winds fertilizing (to fill heavily the clouds with water), then cause the water (rain) to descend from the sky and We give it to you to drink. (Qur'an 15:22)

The Arabic word used here is *lawaaqih* which is the plural of *laaqih* from *laqaha*, which means to impregnate or fecundate. In this context, impregnate means that the wind pushes the clouds together, increasing the condensation that causes lightning and thus rain. A similar description is found in the Qur'an:

﴿اللَّهُ الَّذِي يُرْسِلُ الرِّيحَ فَتُثِيرُ سَحَابًا فَيَبْسُطُهُ فِي السَّمَاءِ كَيْفَ يَشَاءُ وَيَجْعَلُهُ كَسَفًا تَرَى الْوَدْقَ يَخْرُجُ مِنْ خِلَالِهِ فَإِذَا أَصَابَ بِهِ مَنْ يَشَاءُ مِنْ عِبَادِهِ إِذَا هُمْ يَسْتَبْشِرُونَ﴾

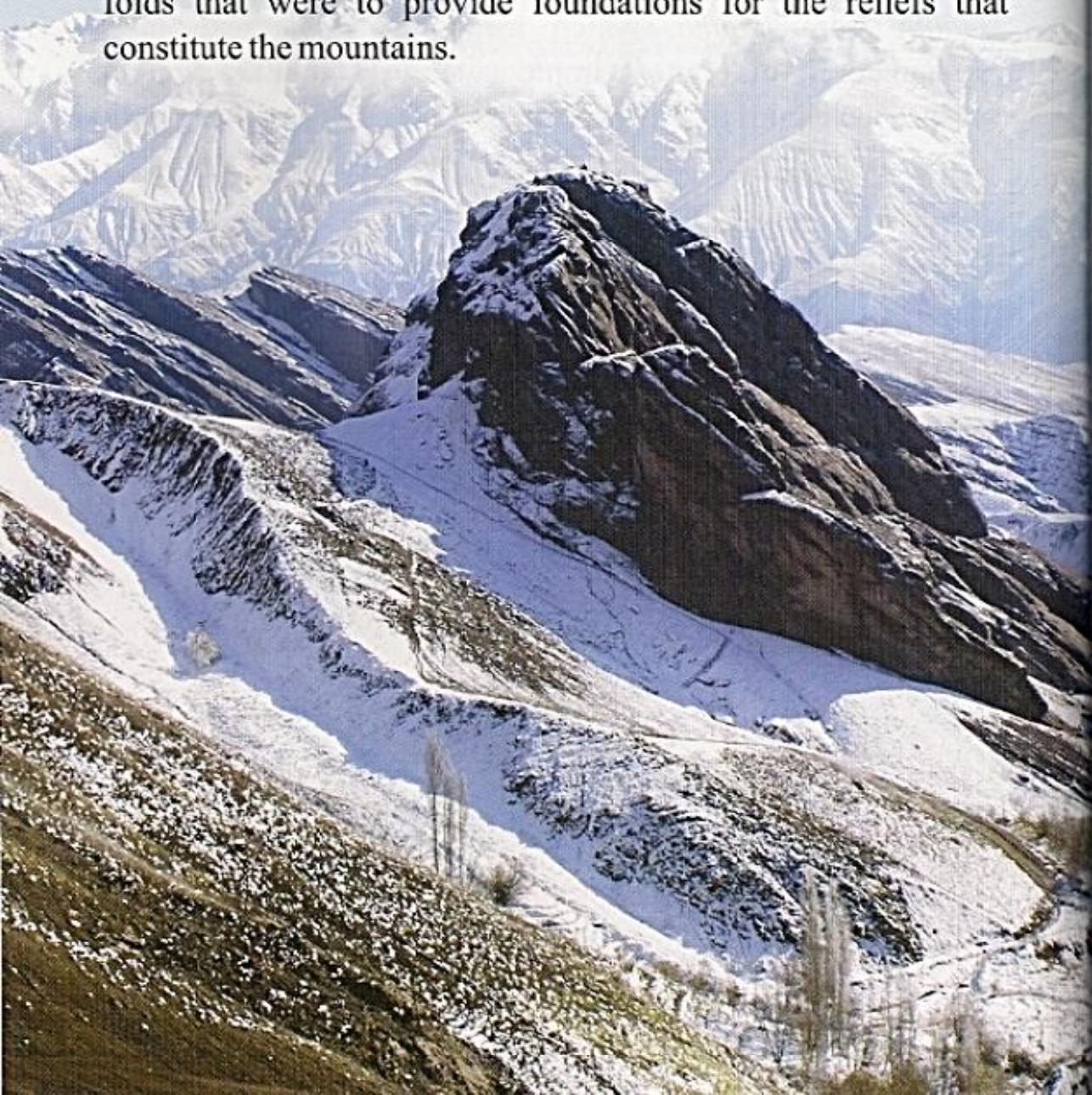
Allah is He Who sends the winds so that they raise clouds and spread them along the sky as He wills, and then break them into fragments until you see rain drops come forth from their midst! Then when He has made them fall on whom of His slaves as He wills, lo, they rejoice! (Qur'an 30:48)

The Qur'anic descriptions are absolutely accurate and agree perfectly with modern data on hydrology. The water cycle is described in several verses of the Glorious Qur'an, including 7:57, 13:17, 25:48-49, 36:34, 50:9-11, 56:68-70, 67:30 and 86:11.



## **Mountains are like Pegs (stakes)**

In geology, the phenomenon of 'folding' is a recently discovered fact. Folding is responsible for the formation of mountain ranges. The earth's crust, on which we live, is like a solid shell, while the deeper layers are hot and fluid, and thus inhospitable to any form of life. It is also known that the stability of the mountains is linked to the phenomenon of folding, for it was the folds that were to provide foundations for the reliefs that constitute the mountains.





Geologists tell us that the radius of the earth is about 3,750 miles and the crust on which we live is very thin, ranging between 1 to 30 miles. Since the crust is thin, it has a high possibility of shaking. Mountains act like stakes or tent pegs that hold the earth's crust and give it stability.

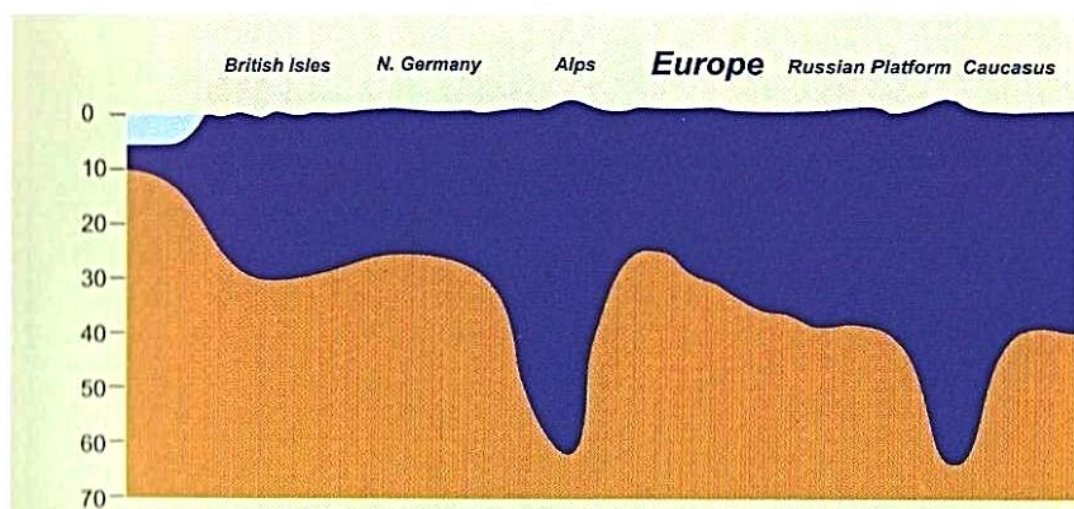
The Qur'an contains exactly such a description in the following verse:

﴿أَلَمْ نَجْعَلِ الْأَرْضَ مِهْدًا ۝٦ وَالْجِبَالَ أَوْتَادًا ۝٧﴾

Have We not made the earth as a resting place, and the mountains as pegs? (Qur'an 78:6-7)

The Arabic word *awtaad* means stakes or pegs, like those used to anchor a tent; they are the deep foundations of geological folds.

The book titled *Earth* is considered as a basic reference textbook on geology in many universities around the world. One of the authors of this book is Frank Press, who was the



This illustration shows how the mountains are peg-like in shape, due to their deep roots



President of the Academy of Sciences in the USA for 12 years and was the Science Advisor to the former US President Jimmy Carter. In this book he illustrates the mountain in a wedge-shape and the mountain itself as a small part of the whole, whose root is deeply entrenched in the ground.<sup>1</sup> According to Dr. Press, the mountains play an important role in stabilizing the crust of the earth.

The Qur'an clearly mentions the function of the mountains in preventing the earth from shaking:

﴿وَجَعَلْنَا فِي الْأَرْضِ رَوَاسِيَ أَنْ تَمِيدَ بِهِمْ﴾

And We have placed on the earth firm mountains, lest it should shake with them. (Qur'an 21:31)

The Qur'anic descriptions are in perfect agreement with modern geological data.



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1. *Earth*, Press and Siever, p. 435. Also see *Earth Science*, Tarbuck and Lutgens, p. 157.

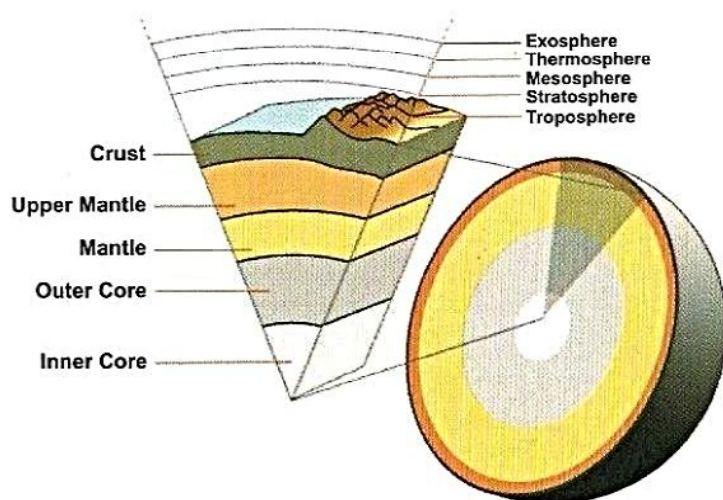
## Mountains Firmly Fixed

The surface of the earth is broken into many rigid plates that are about 100 km in thickness. These plates float on a partially molten region called asthenosphere.

Mountain formations occur at the boundary of the plates. The earth's crust is 5 km thick below the oceans, about 35 km thick below flat continental surfaces and almost 80 km thick below great mountain ranges. These are the strong foundations on which mountains stand. The Qur'an also speaks about the strong mountain foundations in the following verse:

﴿وَالْجِبَالُ أَرْسَاهَا﴾

And the mountains He has fixed firmly.<sup>1</sup> (Qur'an 79:32)

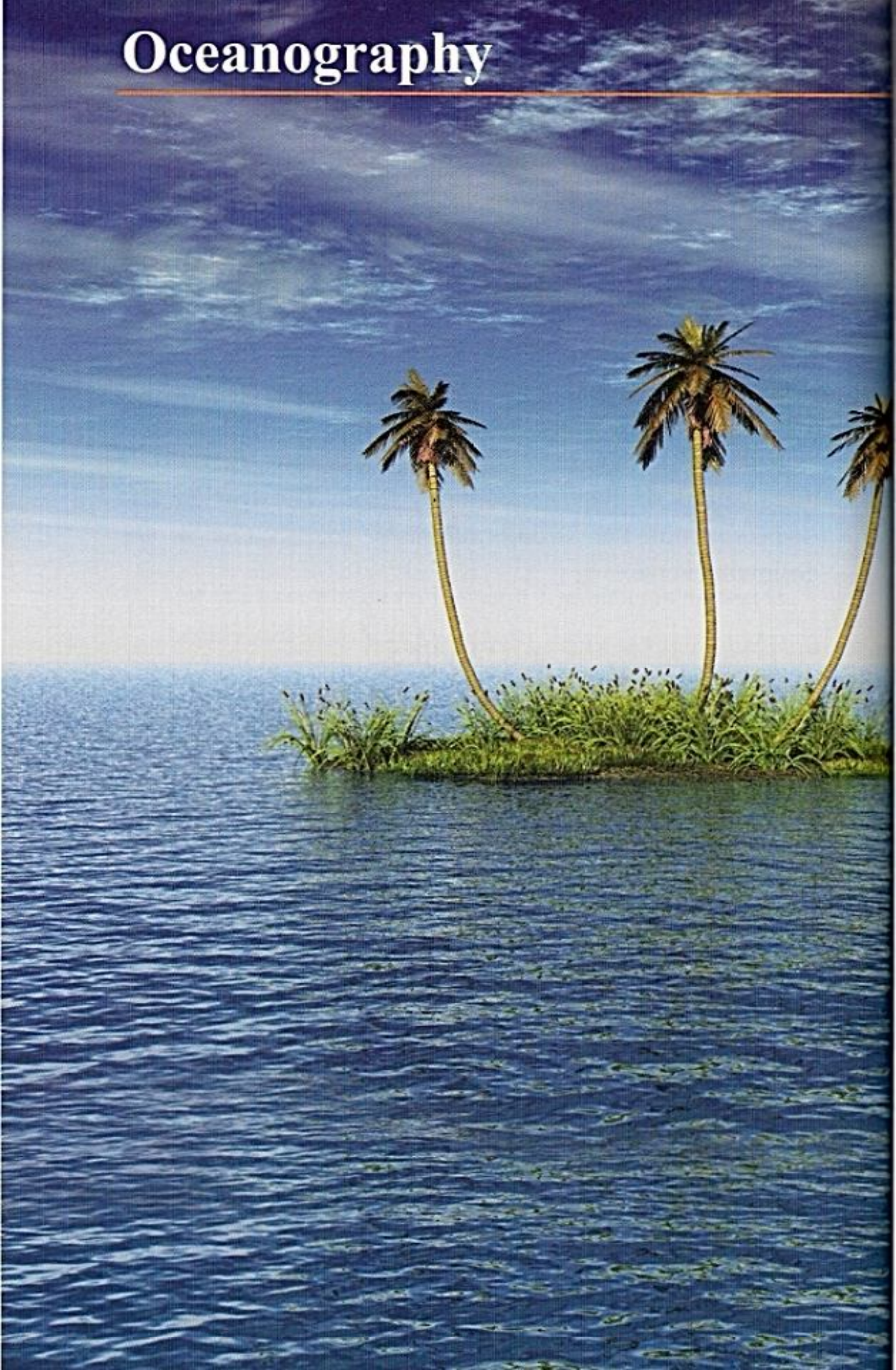


1. A similar message is contained in the Qur'an in 88:19, 31:10 and 16:15.



# Oceanography

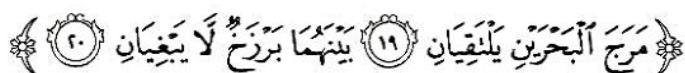
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## The Barrier between Sweet and Salt Waters

Consider the following Qur'anic verses:



He has let loose the two seas (the salt and fresh water) meeting together. Between them is a barrier which none of them can transgress. (Qur'an 55:19-20)

In the Arabic text the word *barzakh* means a barrier or a partition. This barrier is not a physical partition. The Arabic verb *maraja* literally means 'they both meet and mix with each other'. Early commentators of the Qur'an were unable to explain the two opposite meanings for the two bodies of water, i.e., they meet and mix, and at the same time, there is a barrier between them. 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.<sup>1</sup> Oceanographers are now in a better position to explain this verse. There is a slanted unseen water barrier between the two seas through which water from one sea passes to the other.

But when the water from one sea enters the other sea, it loses its distinctive characteristic and becomes homogenized with the other water. In a way, this barrier serves as a transitional homogenizing area for the the two waters.

This scientific phenomenon which the Qur'an mentions was also confirmed by Dr. William Hay who is a well-known

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1. *Principles of Oceanography*, Davis, pp. 92-93.



marine scientist and Professor of Geological Sciences at the University of Colorado, USA.

The Qur'an also mentions this phenomenon in the following verse:

﴿وَجَعَلَ بَيْنَ الْبَحْرَيْنِ حَاجِزًا﴾

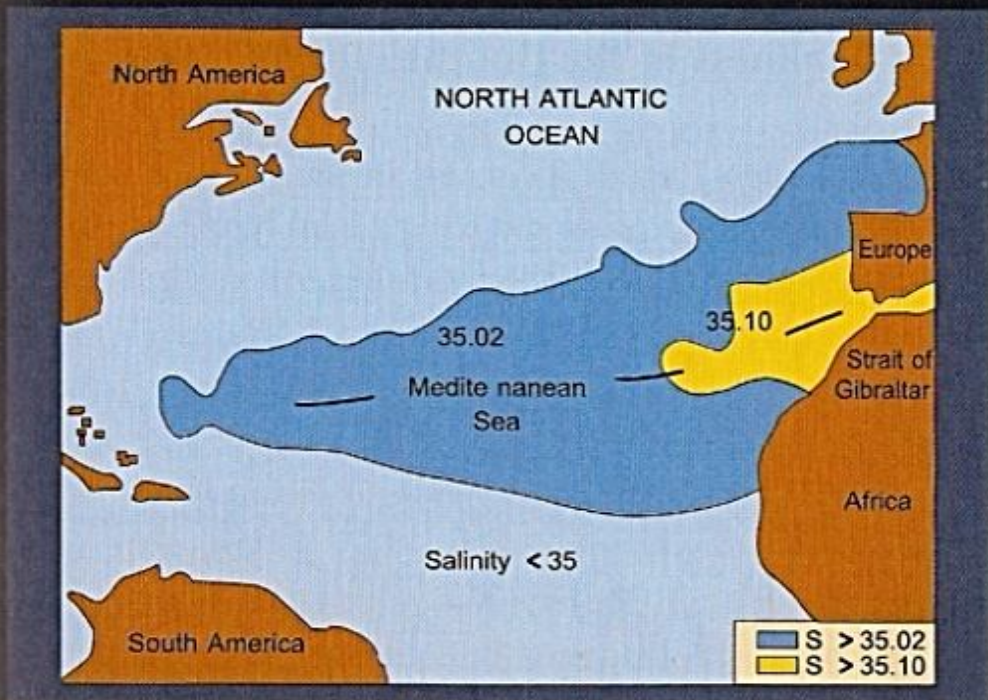
And He has set a barrier between the two seas (of salt and sweet water)? (Qur'an 27:61)

This phenomenon occurs in several places, including the divider between the Mediterranean and the Atlantic Ocean at Gibraltar.

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:

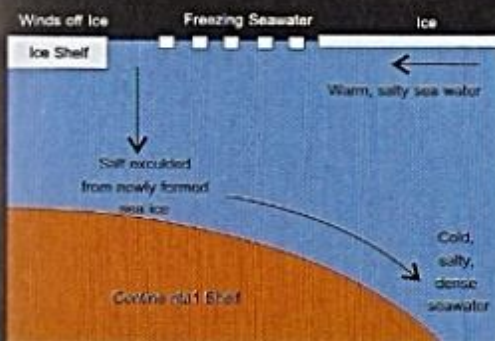
﴿وَهُوَ الَّذِي مَرَجَ الْبَحْرَيْنِ هَذَا عَذْبٌ فُرَاتٌ وَهَذَا مِلْحٌ أُجَاجٌ وَجَعَلَ بَيْنَهُمَا بَرْزَخًا وَحِجْرًا مَّحْجُورًا﴾

It is He Who has let free the two bodies of flowing water: One palatable and sweet, and the other salt and bitter; yet has He made a barrier between them, a partition that is not to be passed. (Qur'an 25:53)



Modern science has discovered that in estuaries, where fresh (sweet) and salt water meet, the situation is somewhat different from that 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 two layers.”<sup>1</sup> This partition (zone of separation) has a salinity different from both the fresh water and the salt water.

This phenomenon occurs in several places, including Egypt, where the river Nile flows into the Mediterranean Sea.



1. *Oceanography*, Gross, p.244 and *Introductory Oceanography*, Thurman pp. 200-201.



## Darkness in the Depths of the Ocean

Professor Durga Rao is an expert in the field of marine geology and was a professor at King Abdul Aziz University in Jeddah, Saudi Arabia. When was asked to comment on the following verse:

﴿أَوْ كَظُلُمَاتٍ فِي بَحْرٍ لُّجِّيٍّ يَغْشَاهُ مَوْجٌ مِّنْ فَوْقِهِ مَوْجٌ مِّنْ فَوْقِهِ سَحَابٌ  
ظُلُمَاتٌ بَعْضُهَا فَوْقَ بَعْضٍ إِذَا أَخْرَجَ يَدَهُ لَمْ يَكْدِرْهَا وَمَن لَّمْ يَجْعَلِ اللَّهُ لَهُ  
نُورًا فَمَا لَهُ مِن نُّورٍ﴾

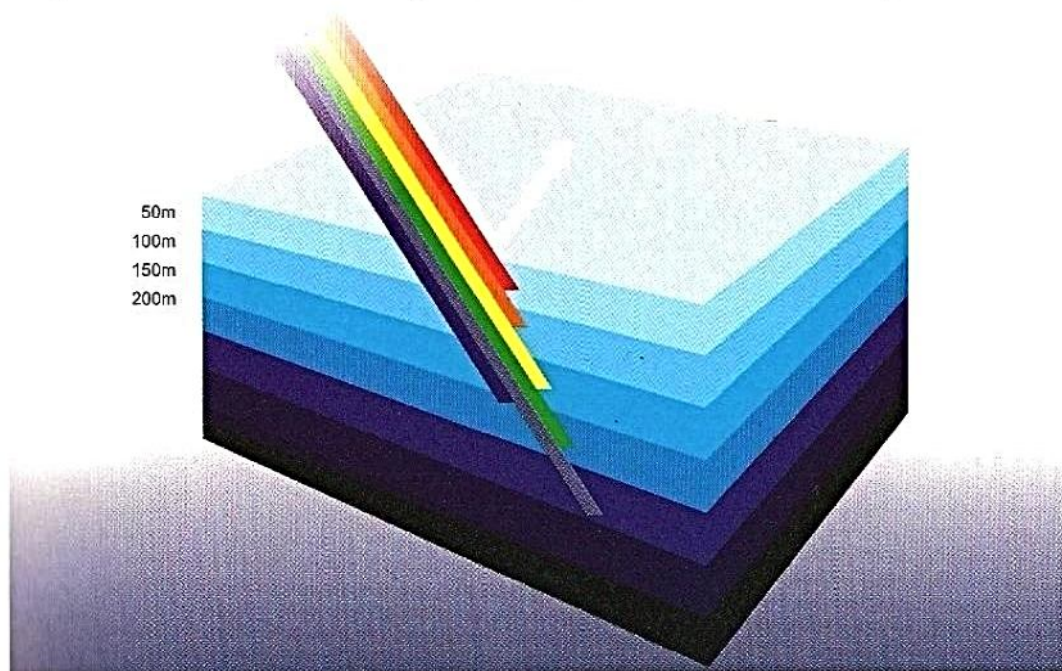
Or (the disbelievers' state) is like the depths of darkness in a vast deep ocean overwhelmed with waves topped by waves, topped by dark clouds, [layers of] darkness upon darkness: if a man stretches out his hand, he can hardly see it! And he for whom Allah has not appointed light, for him there is no light. (Qur'an 24:40)

Professor Rao said that scientists have only now been able to confirm, with the help of modern equipment, that there is darkness in the depths of the ocean. Humans are unable to dive unaided underwater for more than 20 to 30 metres and cannot survive in the deep oceanic regions at a depth of more than 200 metres. This verse does not refer to all seas because not every sea can be described as having accumulated darkness layered one over another. It refers especially to a deep sea or deep ocean, as the Qur'an says, "darkness in vast deep ocean". This layered darkness in a deep ocean is the result of two causes:

1. A light ray is composed of seven colours. These seven colours are violet, indigo, blue, green, yellow, orange and

red (VIBGYOR). The light ray undergoes refraction when it hits water. The upper 10 to 15 metres of water absorbs the red colour. Therefore, if a diver is 25 metres under water and gets wounded, he would not be able to see the red colour of his blood because the red colour does not reach this depth. Similarly, orange rays are absorbed at 30 to 50 metres, yellow at 50 to 100 metres, green at 100 to 200 metres, and finally, blue beyond 200 metres and violet and indigo above 200 metres. Due to successive disappearance of colour, one layer after another, the ocean progressively becomes darker, i.e., darkness takes place in layers of light. Below a depth of 1000 metres there is complete darkness.

2. The sun's rays are absorbed by clouds which in turn scatter light rays, thus causing a layer of darkness under the clouds. This is the first layer of darkness. When light rays reach the surface of the ocean they are reflected by the wave surface, giving it a shiny appearance. Therefore, it is the waves that reflect light and cause darkness. The unreflected light penetrates into the depths of the ocean. Therefore, the ocean





has two parts. The surface characterized by light and warmth and the depth characterized by darkness. The surface is further separated from the deep part of the ocean by waves.

The internal waves cover the deep waters of seas and oceans because the deep waters have a higher density than the waters above them.

The darkness begins below the internal waves. Even the fish in the depths of the ocean cannot see; their only source of light is from their own bodies.

The Qur'an rightly says: "Darkness in a vast deep ocean overwhelmed with waves topped by waves."

In other words, above these waves there are more types of waves, i.e., those found on the surface of the ocean. The Qur'anic verse continues, "topped by [dark] clouds; depths of darkness, one above another."

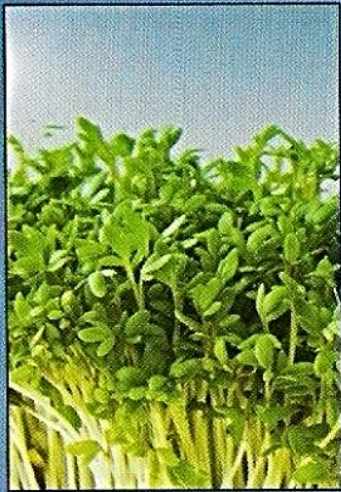
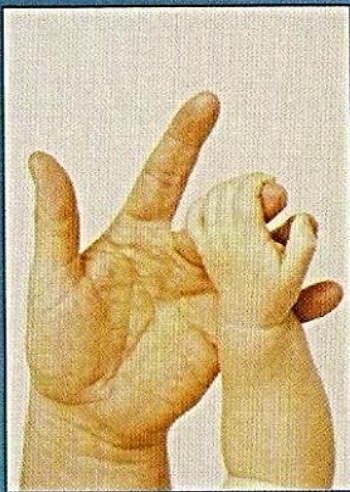
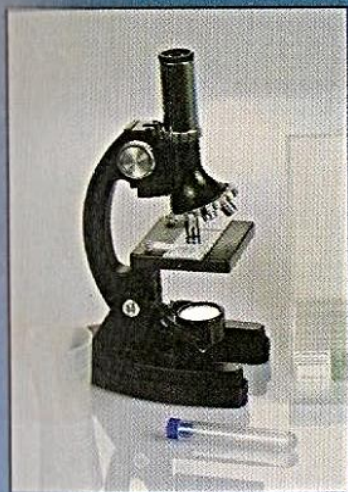
These clouds, as explained, are barriers one over the other that further cause darkness by the absorption of colours at different levels.

Professor Durga Rao concluded by saying, "More than 1400 years ago, a normal human being could not explain this phenomenon in so much detail. Thus the information must have come from a supernatural source."



# Biology

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## Every Living thing is made of Water

Consider the following Qur'anic verse:

﴿أَوَلَمْ يَرِ الَّذِينَ كَفَرُوا أَنَّ السَّمَوَاتِ وَالْأَرْضَ كَانَتْ رَتْقًا فَفَتَقْنَاهُمَا  
وَجَعَلْنَا مِنَ الْمَاءِ كُلَّ شَيْءٍ حَيٍّ أَفَلَا يُؤْمِنُونَ﴾

Have those who disbelieve not known that the heavens and the earth were joined together as one united piece, then We parted them? And We have made from water every living thing. Will they not then believe? (Qur'an 21:30)

Only after advances had been made in science did we now know that cytoplasm, the basic substance of the cell, is made up of 80% water. Modern research has also revealed that most organisms consist of 50% to 90% water and that every living entity requires water for its existence.

Was it possible over fourteen centuries ago for any human being to guess that every living being was made of water? Moreover, would such a guess be conceivable by a human being in the deserts of Arabia where there has always been scarcity of water?

The following verse refers to the creation of animals from water:

﴿وَاللَّهُ خَلَقَ كُلَّ دَابَّةٍ مِّن مَّاءٍ﴾

Allah has created every moving [living] creature from water. (Qur'an 24:45)

The following verse refers to the creation of human beings from water:

﴿وَهُوَ الَّذِي خَلَقَ مِنَ الْمَاءِ بَشَرًا فَجَعَلَهُ نَسَبًا وَصِهْرًا وَكَانَ رَبُّكَ قَدِيرًا﴾

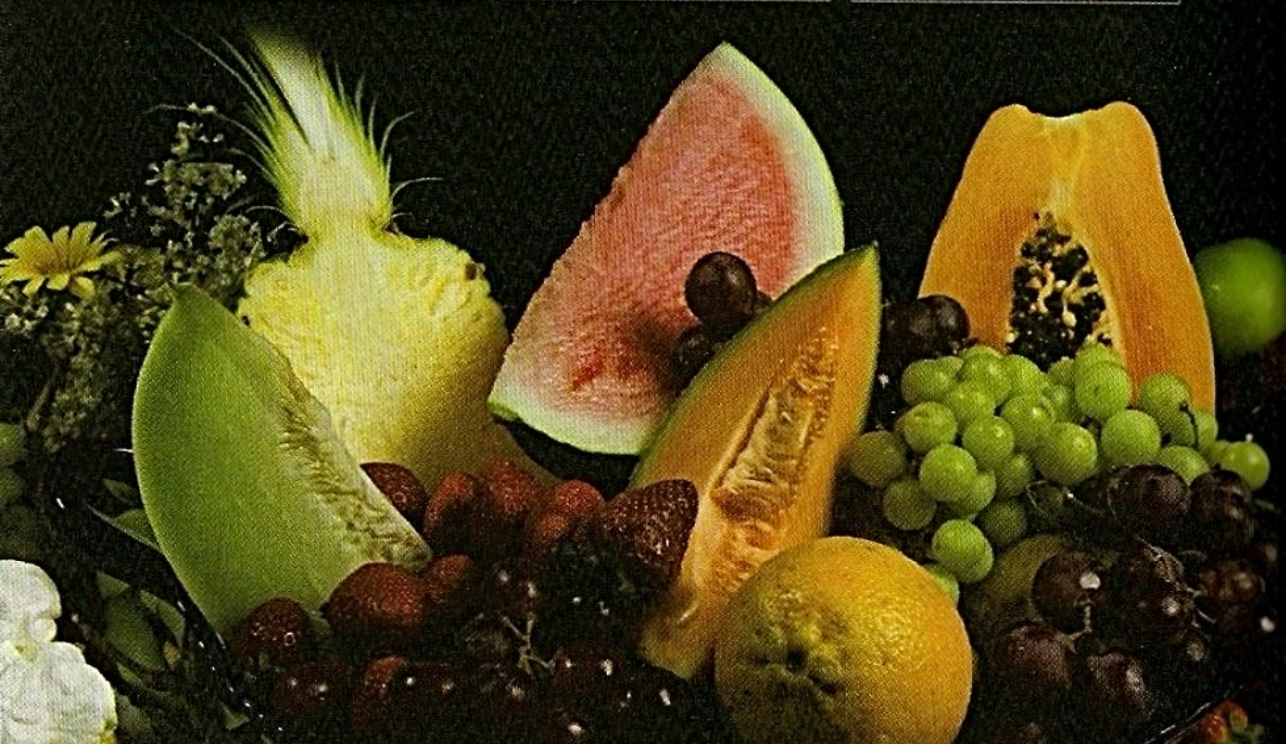
And it is He Who has created man from water and has appointed for him kindred by blood and kindred by marriage. And your Lord is ever All-Powerful to do what He wills. (Qur'an 25:54)





## Plants Created in Pairs, Male and Female

Previously humans did not know that plants, too, have male and female gender distinctions. Botany states that every plant has a male and female gender. Even the plants that are unisexual have distinct elements of both male and female.





The Qur'an says:

﴿وَأَنْزَلَ مِنَ السَّمَاءِ مَاءً فَأَخْرَجْنَا بِهِ أَزْوَاجًا مِّن نَّبَاتٍ شَتَّىٰ﴾

And He has sent down water (rain) from the sky. And We have brought forth with it various kinds of vegetation.  
(Qur'an 20:53)

## Fruits Created in Pairs, Male and Female

﴿وَمِنْ كُلِّ الشَّجَرِ جَعَلْنَا فِيهَا زَوْجَيْنِ اثْنَيْنِ﴾

And of every kind of fruit He made two pairs. (Qur'an 13:3)

Fruit is the end product of reproduction of the superior plants. The stage preceding fruit is the flower, which has male and female organs (stamens and ovules). Once pollen has been carried to the flower, they bear fruit, which in turn matures and frees its seed. All fruits, therefore, imply the existence of male and female organs; a fact that is mentioned in the Qur'an.

In certain species, fruit can come from non-fertilized flowers (parthenocarpic fruit), e.g., bananas, certain types of pineapple, fig, orange and vine. They also have definite sexual characteristics.

## Everything Made in Pairs

﴿وَمِنْ كُلِّ شَيْءٍ خَلَقْنَا زَوْجَيْنِ﴾

And of everything We have created pairs. (Qur'an 51:49)

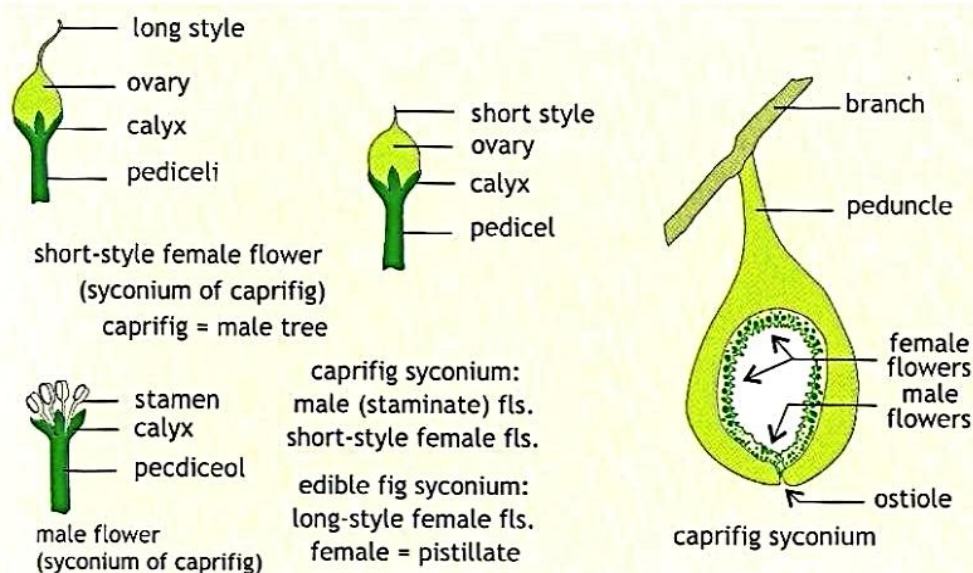


This refers to things other than humans, animals, plants and fruits. It may also refer to a phenomenon like electricity in which the atoms consist of negatively- and positively-charged electrons and protons.

﴿سُبْحَنَ الَّذِي خَلَقَ الْأَزْوَاجَ كُلَّهَا مِمَّا تُنْبِتُ الْأَرْضُ وَمِنْ أَنْفُسِهِمْ وَمِمَّا لَا يَعْلَمُونَ﴾

Glorified is He Who has created all the pairs of that which the earth produces, as well as of their own [human] kind (male and female), and of that which they know not. (Qur'an 36:36)

The Qur'an here says that everything is created in pairs, including things that humans do not know at present and may discover later.



# Zoology

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## Animals and Birds Live in Communities

﴿وَمَا مِنْ دَابَّةٍ فِي الْأَرْضِ وَلَا طَائِرٍ يَطِيرُ بِجَنَاحَيْهِ إِلَّا أُمَمٌ أَمْثَالُكُمْ﴾

There is not a moving [living] creature on earth, nor a bird that flies with its two wings, but are communities like you.

(Qur'an 6:38)

Research has shown that animals and birds live in communities, i.e., they organize, live and work together.

## The Flight of Birds

Regarding the flight of birds, the Qur'an says:

﴿أَلَمْ يَرَوْا إِلَى الطَّيْرِ مُسَخَّرَاتٍ فِي جَوِّ السَّمَاءِ مَا يُمَسِّكُهُنَّ إِلَّا اللَّهُ ۚ إِنَّ فِي ذَلِكَ لَآيَاتٍ لِقَوْمٍ يُؤْمِنُونَ﴾

Do they not see the birds held [flying] in the midst of the sky? None holds them but Allah (i.e. none give them the ability to fly but Allah). Verily, in this are clear signs for a people who believe [in the Oneness of Allah]. (Qur'an 16:79)

A similar message is repeated in the Qur'an in the verse:

﴿أَوَلَمْ يَرَوْا إِلَى الطَّيْرِ فَوْقَهُمْ صَفَائِلٌ وَيَقْبِضُنَّ مَا يُمَسِّكُهُنَّ إِلَّا الرَّحْمَنُ إِنَّهُ بِكُلِّ شَيْءٍ بَصِيرٌ﴾

Do they not see the birds above them, spreading out their wings and folding them in? None upholds them except the

Most Gracious (Allah). Verily, He is All-Seer of everything.

(Qur'an 67:19)

The Arabic verb *amsaka* literally means, 'to put one's hand on, seize, hold, hold someone back', which expresses the idea that Allah holds the birds up in His power and give them the ability to fly. These verses stress the extremely close dependence of the birds' behaviour on Divine order. Modern scientific data has shown the degree of perfection attained by certain species of birds with regard to the programming of their movements. It is only the existence of a migratory programme in the genetic code of the birds that can explain the long and complicated journey that very young birds, without any prior experience and without any guide, are able to accomplish. They are also able to return to the departure point on a definite date.

In his book *Power and Fragility*, Professor Hamburger gives the example of 'mutton-bird' that lives in the Pacific Ocean with its journey of over 15,000 miles in the shape of figure '8'. It makes this journey over a period of six months and comes back to its departure point with a maximum delay of one week. The highly complicated instructions for such a journey have to be contained in the birds' nervous cells. They are definitely programmed. Should we not then reflect on the





## The Bee

﴿وَأَوْحَىٰ رَبُّكَ إِلَى النَّحْلِ أَنِ اتَّخِذِي مِنَ الْجِبَالِ بُيُوتًا وَمِنَ الشَّجَرِ وَمِمَّا يَعْرِشُونَ ﴿٦٨﴾  
ثُمَّ كُلِي مِن كُلِّ الثَّمَرَاتِ فَاسْلُكِي سُبُلَ رَبِّكِ ذُلُلًا ۚ﴾ ﴿٦٩﴾

And your Lord inspired the bee, saying: "Take you habitations in the mountains and in the trees and in what they erect. Then, eat of all fruits and follow the ways of your Lord made easy [for you]". There comes forth from their bellies a drink of varying colour wherein is healing for men. Verily, in this is indeed a sign for a people who think. (Qur'an 16:68:69)

Von-Frisch received the Nobel Prize in 1973 for his research on the behaviour and communication of the bees. The bee, after discovering any new garden or flower, goes back and tells its fellow bees the exact direction and map to get there, which is known as 'bee dance'. The meanings of this insect's movements that are intended to transmit information between worker bees have been discovered scientifically using photography and other methods. The above verse mentions how the bee finds, with great skill, the spacious paths of its Lord.

The worker bee or the soldier bee is a female bee. In *Surat An-Nahl*, chapter no. 16, verses 68 and 69, the gender used for the bee is the female gender (*fashukee* and *kulee*), indicating that the bee that leaves its home for gathering food is a female bee. In other words, the soldier or worker bee is a female bee.



However, in Shakespeare's play *Henry the Fourth*, some of the characters speak about bees and mention that the bees are soldiers and that they have a king. That is what people thought in Shakespearean times. They thought that the worker bees are male bees and they go home and are answerable to a king bee. This, however, is not true. The worker bees are females and they do not report to a king bee but rather to a queen bee. But it took modern investigations at least 300 years to discover this fact.





## Fragility of the Spider's Web/Home

The Qur'an mentions in *Surat Al-Ankaboot*,

﴿مَثَلُ الَّذِينَ أَخَذُوا مِنْ دُونِ اللَّهِ أَوْلِيَاءَ كَمَثَلِ الْعَنْكَبُوتِ  
أَخَذَتْ بَيْتًا وَإِنَّ أَوْهَنَ الْبُيُوتِ لَبَيْتُ الْعَنْكَبُوتِ لَوْ كَانُوا  
يَعْلَمُونَ﴾

The likeness of those who take [false deities as] *awliyaa'* (protectors, helpers) other than Allah is the likeness of a spider who builds [for itself] a house; but truly, the flimsiest of houses is the spider's house if they but knew. (Qur'an 29:41)

Besides giving the physical description of the spider's web as being very flimsy, delicate and weak, the Qur'an also stresses the flimsiness of the relationship in the spider's house, where the female spider many a times kills its mate, the male spider.



## Lifestyle and Communication of Ants

Consider the following Qur'anic verse:

﴿وَحُشِرَ لِسُلَيْمَانَ جُنُودُهُ مِنَ الْجِنِّ وَالْإِنسِ وَالطَّيْرِ فَهُمْ يُوزَعُونَ ﴿١٧﴾ حَتَّىٰ إِذَا  
أَتَوْا عَلَىٰ وَادِ النَّمْلِ قَالَتْ نَمْلَةٌ يَأَيُّهَا النَّمْلُ ادْخُلُوا مَسْكِنَكُمْ لَا  
يَحْطِمَنَّكُمْ سُلَيْمَانُ وَجُنُودُهُ وَهُمْ لَا يَشْعُرُونَ ﴿١٨﴾﴾

And there were gathered before Sulaimaan (Solomon) his hosts of jinn and men and birds, and they all were set in battle order (marching forward). At length, when they came to the valley of the ants, one of the ants said: "O ants! Enter your dwellings, lest Sulaimaan (Solomon) and his hosts should crush you [under foot] without knowing it." (Qur'an 27:17-18)

In the past, some people would have probably mocked the Qur'an, taking it to be a fairy tale book in which ants talk to each other and communicate sophisticated messages.





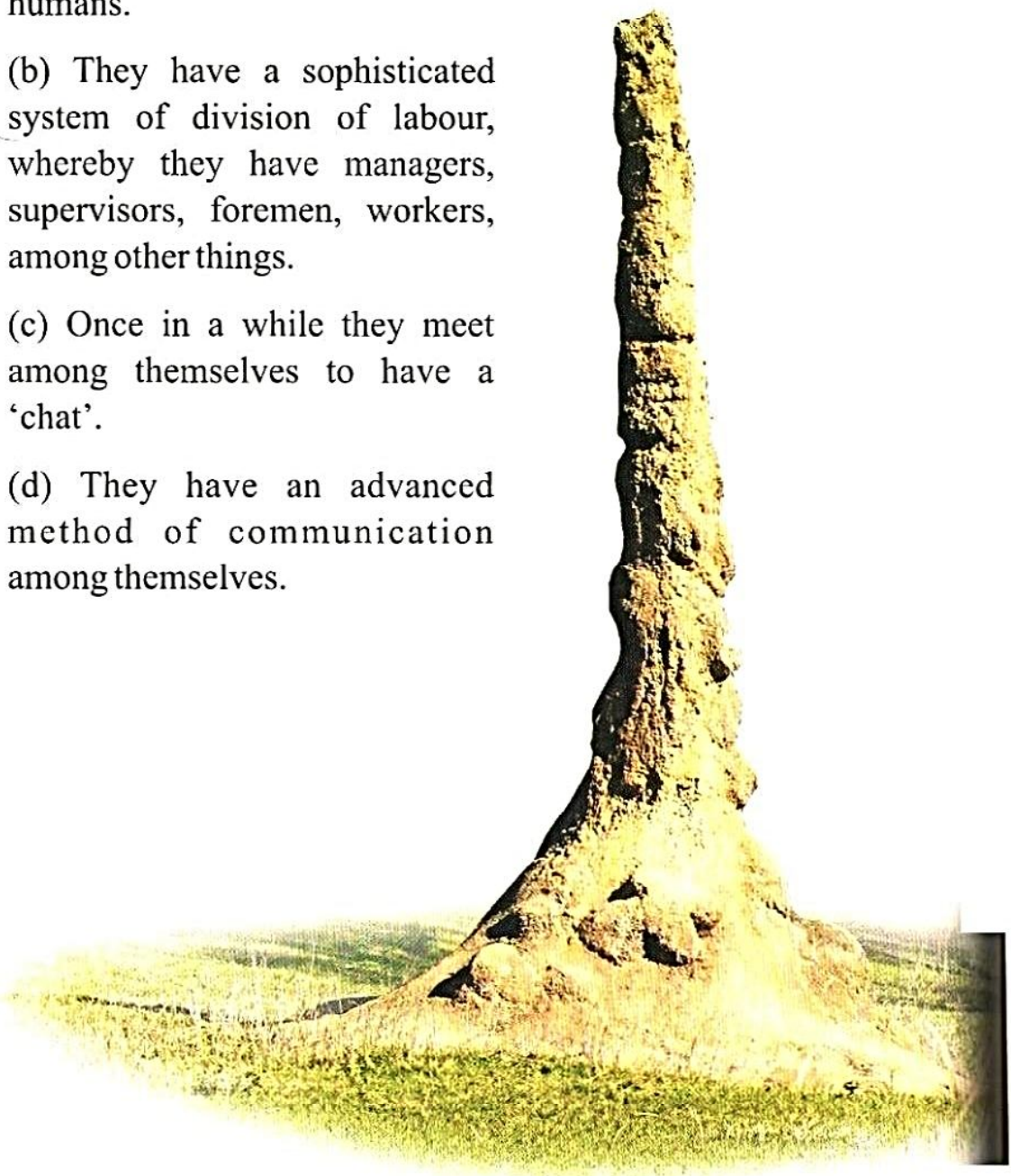
In recent times, however, research has shown us several facts about the lifestyle of ants, which were not known earlier to humankind. Indeed, it has shown that the animals or insects whose lifestyle is closest in resemblance to the lifestyle of human beings are the ants. This can be seen from the following findings regarding ants:

(a) The ants bury their dead in a manner similar to that of humans.

(b) They have a sophisticated system of division of labour, whereby they have managers, supervisors, foremen, workers, among other things.

(c) Once in a while they meet among themselves to have a 'chat'.

(d) They have an advanced method of communication among themselves.



(e) They hold regular markets where they exchange goods.

(f) They store grains for long periods in winter, and if the grain begins to bud, they cut the roots as though they understand that if they leave it to grow, it will rot. If the stored grains get wet due to rains, they take these grains out into the sunlight to dry; and once these are dry, they take them back inside as though they know that humidity will cause development of root systems and thereafter the rotting of the grains.





## Honey has Healing Properties

The bee assimilates juices of various kinds of flowers and fruit and forms within its body the honey, which it stores in its cells of wax. Only a couple of centuries ago, man came to know that honey comes from the belly of the bee. This fact was mentioned in the Qur'an over 1400 years ago in the following verse:

﴿يَخْرُجُ مِنْ بُطُونِهَا شَرَابٌ مُخْتَلِفٌ أَلْوَانُهُ، فِيهِ شِفَاءٌ لِلنَّاسِ﴾

There issues from within their bodies a drink of varying colours, wherein is healing for men. (Qur'an 16:69)

We are now aware that honey has a healing property and also a mild antiseptic property. The Russians used honey to cover their wounds in World War II. The wounds would then retain moisture and would leave very little scar tissue. Due to the density of honey, no fungus or bacteria would grow in the wounds.

A person suffering from an allergy of a particular plant may be given honey from that plant so that the person develops resistance to that allergy. Honey is rich in fructose and vitamin K.

Thus the knowledge contained in the Qur'an regarding honey, its origin and properties, was far ahead of the time in which it was revealed.



# Physiology

## Blood Circulation and the Production of Milk

The Qur'an was revealed 600 years before the Muslim scientist Ibn an-Nafees described the circulation of the blood and 1000 years before William Harvey brought this understanding to the Western world. Roughly thirteen centuries before it was known what happens in the intestines to ensure that organs are nourished by the process of digestive absorption, a verse in the Qur'an described the source of the constituents of milk, in conformity with these notions.

To understand the Qur'anic verse concerning the above concepts, it is important to know that chemical reactions occur in the intestines and that, from there, substances extracted from food pass into the blood stream via a complex system; sometimes by way of the liver, depending on their chemical nature. The blood transports them to all the organs of the body, among which are the milk-producing mammary glands.

In simple terms, certain substances from the contents of the





intestines enter into the vessels of the intestinal wall itself, and these substances are transported by the blood stream to the various organs.

This concept must be fully appreciated if we wish to understand the following verses in the Qur'an:

﴿وَإِنَّ لَكُمْ فِي الْأَنْعَامِ لَعِبْرَةً تَسْقِيكُمْ مِمَّا فِي بُطُونِهِمْ مِنْ بَيْنِ فَرْثٍ وَدَمٍ لَبَنًا خَالِصًا سَائِغًا لِلشَّارِبِينَ﴾

And verily in the cattle, there is an instructive sign for you. We give you to drink of that which is in their bellies, from between excretions and blood, pure milk, palatable to the drinkers. (Qur'an 16:66)<sup>1</sup>

﴿وَإِنَّ لَكُمْ فِي الْأَنْعَامِ لَعِبْرَةً تَسْقِيكُمْ مِمَّا فِي بُطُونِهَا وَلَكُمْ فِيهَا مَنَافِعُ كَثِيرَةٌ وَمِنْهَا تَأْكُلُونَ﴾

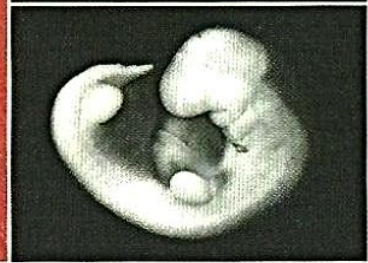
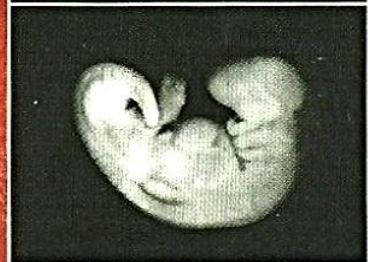
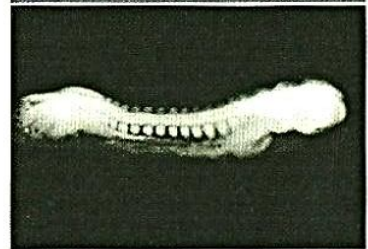
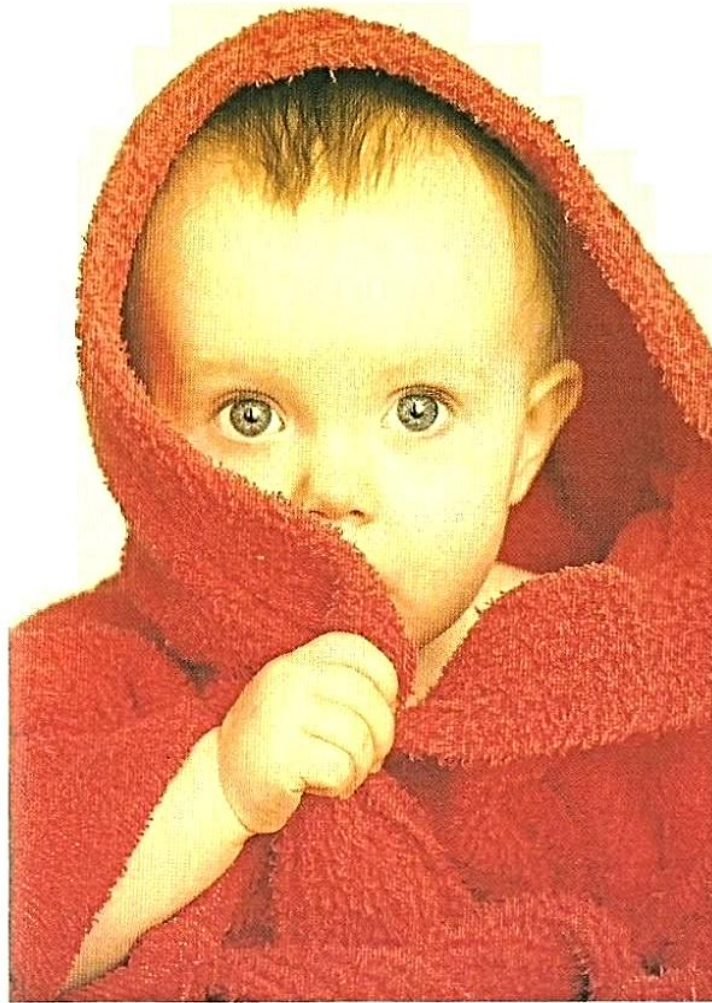
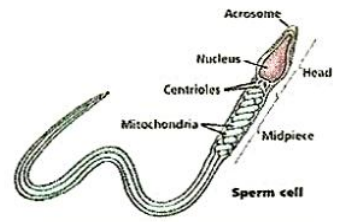
And verily, in cattle there is indeed an instructive example for you. We give you to drink [milk] of that which is in their bellies. And there are, in them, numerous [other] benefits for you, and of their [meat] you eat. (Qur'an 23:21)

The Qur'anic description of the production of milk in cattle is strikingly similar to what modern physiology has discovered in this regard.

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1. Translation of this Qur'anic verse is from the book *The Bible, the Qur'an and Science* by Dr. Maurice Bucaille.

# Embryology





## Man is created from 'Alaq —a Leech-like Substance

A few years ago, a group of Arabs collected all information concerning embryology from the Qur'an and followed the instruction of the Qur'an:

﴿فَسْأَلُوا أَهْلَ الذِّكْرِ إِنْ كُنْتُمْ لَا تَعْلَمُونَ﴾

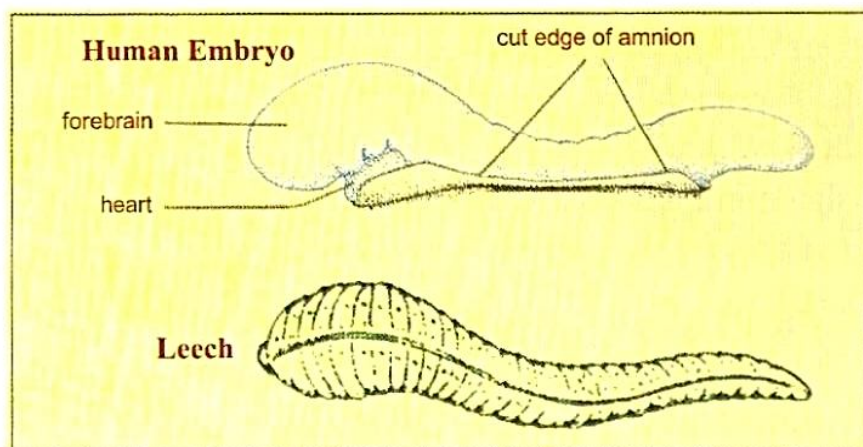
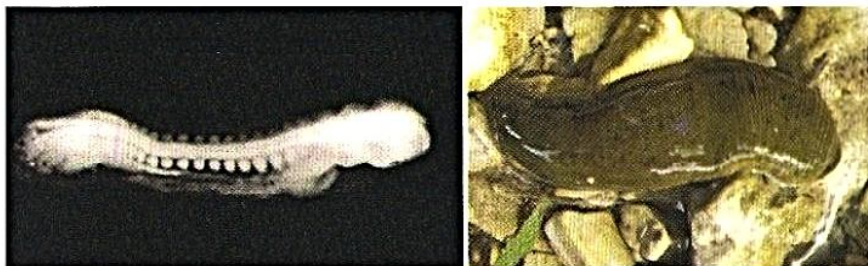
So ask (you, O pagans of Makkah) of those who know the Scripture [learned men of the *Tawraat* (Torah) and the *Injeel* (Gospel)], if you know not. (Qur'an 16:43 & 21:7)

All the information from the Qur'an so gathered, was translated into English and presented to Dr. Keith Moore, who was professor of embryology and chairman of the Department of Anatomy at the University of Toronto, Canada. At present he is one of the highest authorities in the field of embryology.

He was asked to give his opinion regarding the information present in the Qur'an concerning the field of embryology. After carefully examining the translation of the Qur'anic verses presented to him, Dr. Moore said that most of the information concerning embryology mentioned in the Qur'an is in perfect conformity with modern discoveries in the field of embryology and does not conflict with them in any way. He added that there were, however, a few verses, on whose scientific accuracy he could not comment. He could not say whether the statements were true or false, since he himself was not aware of the information contained in them. There was also no mention of this information in modern writings and studies on embryology. One such verse is:

﴿أَفْرَأَيْتَ بِأَسْمِ رَبِّكَ الَّذِي خَلَقَ ﴿١﴾ خَلَقَ الْإِنْسَانَ مِنْ عَلَقٍ ﴿٢﴾﴾

Read! In the Name of your Lord Who has created [all that exists]. He has created man from *alaq*. (Qur'an 96:1-2)



The word '*alaq*, (or '*alaqah*) besides meaning a congealed clot of blood, also means something that clings, a leech-like substance.

Dr. Keith Moore had no knowledge whether an embryo in the initial stages appears like a leech. To check this out, he studied the initial stage of the embryo under a very powerful microscope in his laboratory and compared what he observed with a diagram of a leech and he was astonished at the striking resemblance between the two!

In the same manner, he acquired more information on embryology, that was hitherto not known to him, from the Qur'an.



Dr. Keith Moore answered about eighty questions dealing with embryological data mentioned in the Qur'an and the Prophetic traditions (*hadeeth*). Noting that the information contained in the Qur'an and *hadeeth* was in full agreement with the latest discoveries in the field of embryology, Professor Moore said, "If I was asked these questions thirty years ago, I would not have been able to answer half of them for lack of scientific information."

Dr. Keith Moore had earlier authored the book *The Developing Human*. After acquiring new knowledge from the Qur'an, he wrote, in 1982, the 3rd edition of the same book. The book was the recipient of an award for the best medical book written by a single author. This book has been translated into several major languages of the world and is used as a textbook of embryology in the first year of medical studies.

In 1981, during the Seventh Medical Conference in Dammam, Saudi Arabia, Dr. Moore said, "It has been a great pleasure for me to help clarify statements in the Qur'an about human development. It is clear to me that these statements must have come to Muhammad from God, or Allah, because almost all of this knowledge was not discovered until many centuries later. This proves to me that Muhammad must have been a Messenger of God, or Allah."<sup>1</sup>

Dr. Joe Leigh Simpson, Chairman of the Department of Obstetrics and Gynecology at the Baylor College of Medicine, Houston, USA, proclaims, "These sayings of Muhammad (ﷺ) could not have been obtained on the basis of the scientific knowledge that was available at the time of

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1. The reference for this statement is the video tape titled "*This is the Truth*". For a copy of this video tape, contact the Islamic Research Foundation.

the writer (7th century). It follows that not only is there no conflict between genetics and religion (Islam), but in fact religion (Islam) may guide science by adding revelation to some of the traditional scientific approaches. There exist statements in the Qur'an shown centuries later to be valid, which support knowledge in the Qur'an having been derived from God."

### **Man Created from a drop emitted from between the Backbone and the Ribs**

﴿فَلْيَنْظُرِ الْإِنْسَانُ مِمَّ خُلِقَ ﴿٥﴾ خُلِقَ مِنْ مَّاءٍ دَافِقٍ ﴿٦﴾ يَخْرُجُ مِنْ بَيْنِ الصُّلْبِ  
وَالرَّأْيِ ﴿٧﴾﴾

So, let man see from what he is created! He is created from a fluid gushing forth, proceeding from between the backbone and the ribs. (Qur'an 86:5-7)

In embryonic stages, the reproductive organs of the male and female, i.e. the testicles and the ovaries, begin their development near the kidney between the spinal column and the eleventh and twelfth ribs. Later they descend; the female gonads (ovaries) stop in the pelvis while the male gonads (testicles) continue their descent before birth to reach the scrotum through the inguinal canal. Even in the adult after the descent of the reproductive organ, these organs receive their nerve supply and blood supply from the abdominal aorta, which is in the area between the backbone (spinal column) and the ribs. Even the lymphatic drainage and the venous return go to the same area.



## Human Beings created from *Nutfah* (Minute Quantity of Liquid)

﴿إِنَّا خَلَقْنَا الْإِنْسَانَ مِنْ نُطْفَةٍ أَمْشَاجٍ﴾

Verily, We have created man from *nutfah* (mixed drops of male and female sexual discharge). (Qur'an 76:2)



The Glorious Qur'an mentions no less than eleven times that the human being is created from *nutfah*, which means a minute quantity of liquid or a trickle of liquid which remains after emptying a cup. This is mentioned in several verses of the Qur'an including 22:5 and 23:13.<sup>1</sup>

Science has confirmed in recent times that only one out of an average of three million ejaculated sperms is required for fertilizing the ovum. This means that only a 1/three millionth part or 0.00003% of the quantity of ejaculated sperms that are emitted is required for fertilization.

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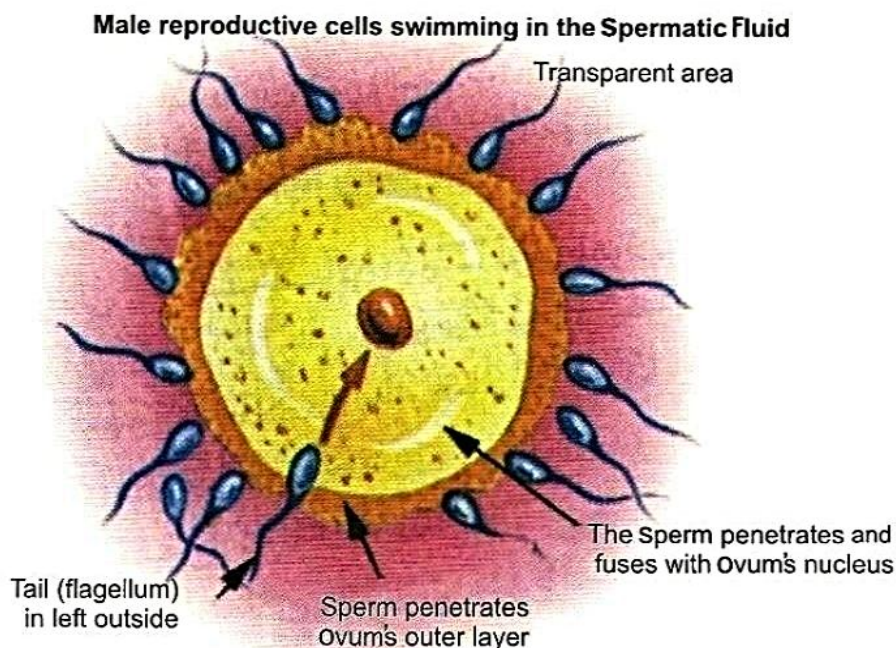
1. The same is also mentioned in the Qur'an in 16:4, 18:37, 35:11, 36:77, 40:67, 53:46, 75:37, 76:2 and 80:19.

## Human Beings created from *Sulaalah* (Quintessence of Liquid)

﴿ثُمَّ جَعَلَ نَسْلَهُ مِنْ سُلَالَةٍ مِّن مَّاءٍ مَّهِينٍ﴾

Then He made his offspring from semen of despised water  
(male and female sexual discharge). (Qur'an 32:8)

The Arabic word *sulaalah* means quintessence or the best part of a whole. We have come to know now that only one single spermatozoon that penetrates the ovum is required for fertilization, out of the several millions produced by a man. That one spermatozoon out of several millions is referred to in the Qur'an as *sulaalah*. *Sulaalah* also means gentle extraction from a fluid. The fluid refers to both male and female germinal fluids containing gametes. Both ovum and sperm are gently extracted from their environments in the process of fertilization.





## Man created from Mingled Liquids

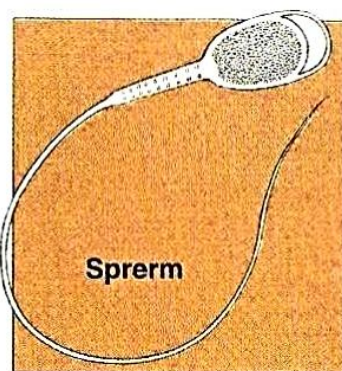
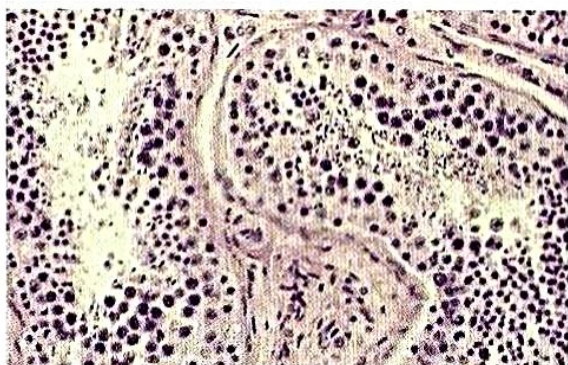
Consider the following Qur'anic verse:

﴿إِنَّا خَلَقْنَا الْإِنْسَانَ مِنْ نُطْفَةٍ أَمْشَاجٍ﴾

Verily, We have created man from *nutfah* (mixed drops of male and female sexual discharge). (Qur'an 76:2)

The Arabic words '*nutfatin amshaajin*' means mingled liquids. According to some commentators of the Qur'an, mingled liquids refer to the male or female agents or liquids. After mixture of male and female gamete, the zygote still remains *nutfah*. Mingled liquids can also refer to spermatic fluid that is formed of various secretions that come from various glands.

Therefore *nutfatin amshaajin*, i.e. a minute quantity of mingled fluids, refers to the male and female gametes (germinal fluids or cells) and part of the surrounding fluids.



## Sex Determination

The sex of a foetus is determined by the nature of the sperm and not the ovum. The sex of the child, whether male or female depends on whether the 23rd pair of chromosomes is XX or XY, respectively.

Primarily, sex determination occurs at fertilization and depends upon the type of sex chromosome in the sperm that fertilizes an ovum. If it is an 'X' bearing sperm that fertilizes the ovum, the foetus is a female, and if it is a 'Y' bearing sperm then the foetus is a male.

﴿وَأَنَّهُ خَلَقَ الذَّكَرَ وَالْأُنثَىٰ ﴿٤٥﴾ مِن نُّطْفَةٍ إِذَا تُمْنَىٰ ﴿٤٦﴾﴾

And that He (Allah) creates the pairs, male and female, from *nutfah* (mixed drops of male and female sexual discharge) when it is emitted. (Qur'an 53:45-46)

The Arabic word *nutfah* means a minute quantity of liquid, and the word *tumnaa* means ejaculated or planted. Therefore, *nutfah* specifically refers to sperm because it is ejaculated.

The Qur'an also says:

﴿الَّذِي يَكْنُ نُطْفَةً مِن مَّنِيٍّ يُمْنَىٰ ﴿٣٧﴾ ثُمَّ كَانَ عَلَقَةً فَخَلَقَ فَسَوَّىٰ ﴿٣٨﴾ فَيَعْلَمُ مِنْهُ الزَّوْجَيْنِ ﴿٣٩﴾﴾  
﴿الذَّكَرَ وَالْأُنثَىٰ ﴿٣٩﴾﴾

Was he not a *nutfah* (mixed drops of male and female sexual discharge) emitted (i.e. Poured forth)? Then he became an '*alaqah*' (a clot); then (Allah) shaped and fashioned [him] in due proportion, and made of him two sexes, male and female. (Qur'an 75:37-39)



Here again it is mentioned that a small quantity (drop) of sperm (indicated by the words *nutfatan min maniyyin*) which comes from the man is responsible for the sex of the foetus.

Mothers-in-law in the Indian subcontinent, by and large, prefer having male grandchildren and often blame their daughters-in-law if the child is not of the desired sex. If only they knew that the determining factor is the nature of the male sperm and not the female ovum! If they were to blame anybody, they should blame their sons and not their daughters-in-law since both the Qur'an and science hold that it is the male fluid that is responsible for the sex of the child!

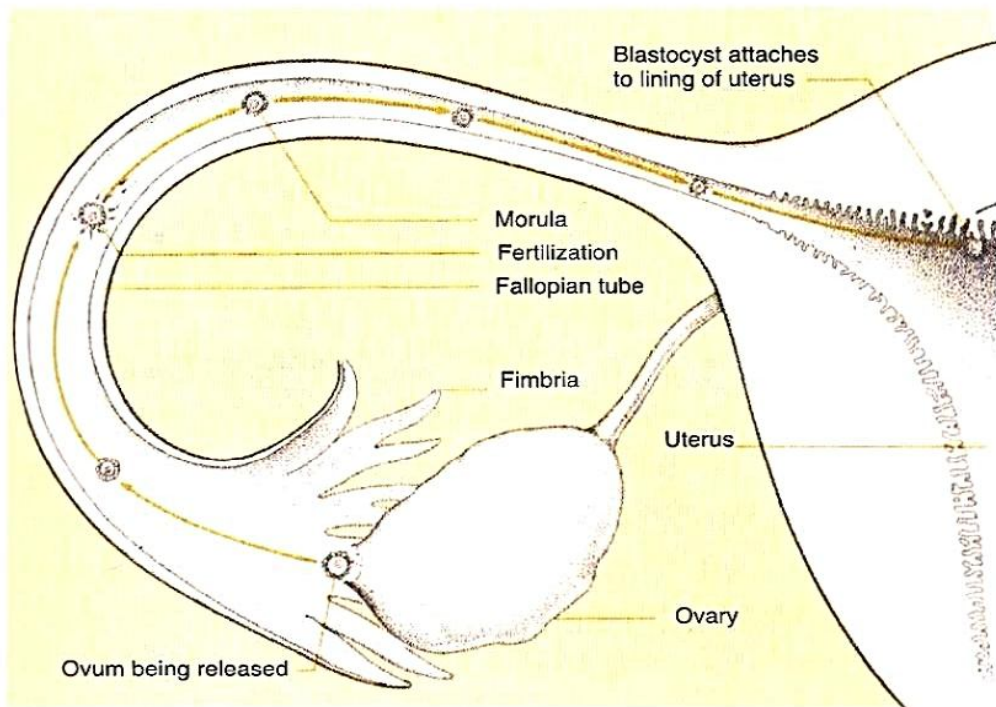
### **Foetus protected by three Veils of Darkness**

﴿يَخْلُقُكُمْ فِي بُطُونِ أُمَّهَاتِكُمْ خَلْقًا مِّنْ بَعْدِ خَلْقٍ فِي ظُلُمَاتٍ ثَلَاثٍ﴾

He creates you, in the wombs of your mothers, creation after creation in three veils of darkness. (Qur'an 39:6)

According to Professor Keith Moore, these three veils of darkness in the Qur'an refer to:

- (i) anterior abdominal wall of the mother
- (ii) the uterine wall
- (iii) the amnio-chorionic membrane



## Embryonic Stages

﴿ وَلَقَدْ خَلَقْنَا الْإِنْسَانَ مِنْ سُلَالَةٍ مِنْ طِينٍ ﴿١٢﴾ ثُمَّ جَعَلْنَاهُ نُطْفَةً فِي قَرَارٍ مَكِينٍ ﴿١٣﴾ ثُمَّ خَلَقْنَا النُّطْفَةَ عَلَقَةً فَخَلَقْنَا الْعَلَقَةَ مُضْغَةً فَخَلَقْنَا الْمُضْغَةَ عِظْمًا فَكَسَوْنَا الْعِظْمَ لَحْمًا ثُمَّ أَنشَأْنَاهُ خَلْقًا آخَرَ فَتَبَارَكَ اللَّهُ أَحْسَنُ الْخَالِقِينَ ﴿١٤﴾ ﴾

And indeed We created man (Adam) out of an extract of clay (water and earth). Thereafter We made him (i.e. the offspring of Adam) as a *nutfah* (mixed drops of male and female sexual discharge and lodged it) in a safe lodging (i.e. womb of the woman). Then We made the *nutfah* into a clot (i.e. a piece of thick coagulated blood), then We made the clot into a little lump of flesh, then We made out of that little



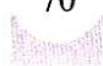
lump of flesh bones, then We clothed the bones with flesh, and then We brought it forth as another creation. So, Blessed is Allah, the Best of creators. (Qur'an 23: 12-14)

In this verse Allah states that man is created from a small quantity of liquid which is placed in a place of rest, firmly fixed (well established or lodged) for which the Arabic phrase *qaraarin makeen* is used. The uterus is well protected from the posterior by the spinal column supported firmly by the back muscles. The embryo is further protected by the amniotic sac containing the amniotic fluid. Thus the foetus has a well-protected dwelling place.

This small quantity of fluid is made into '*alaqah*, meaning something that clings. It also means a leech-like substance. Both descriptions are scientifically acceptable, as in the very early stages the foetus clings to the wall and also appears to resemble the leech in shape. It also behaves like a leech (blood sucker) and acquires its blood supply from the mother through the placenta.

The third meaning of the word '*alaqah* is a blood clot. During this '*alaqah* stage, which spans the third and fourth weeks of pregnancy, the blood clots within closed vessels. Hence the embryo acquires the appearance of a blood clot in addition to acquiring the appearance of a leech.

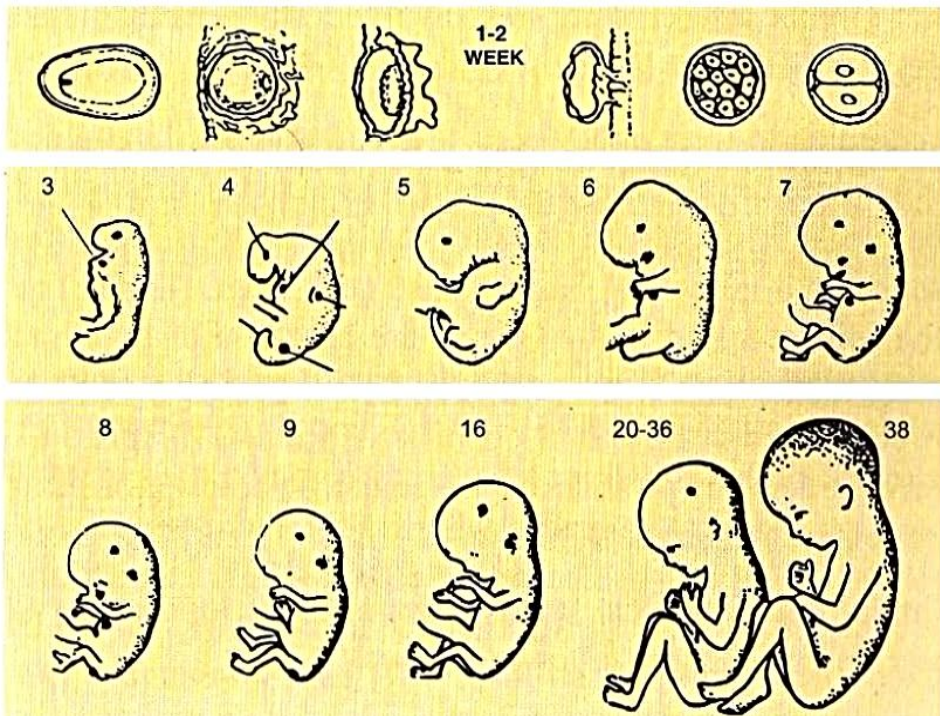
In 1677, Hamm and Leeuwenhoek were the first scientists to observe human sperm cells (spermatozoa) using a microscope. They thought that a sperm cell contained a miniature human being that grew in the uterus to form a newborn. This was known as the perforation theory. When scientists discovered that the ovum was bigger than the sperm, it was thought by De Graf and others that the foetus



existed in a miniature form in the ovum. Later in the 18th century, Maupertuis propagated the theory of biparental inheritance.

The '*alaqah*' is transformed into *mudghah* which literally means 'something that is chewed (having teeth marks)' and also something that is tacky and small, which can be put in the mouth like gum. Both these explanations are scientifically correct. Professor Keith Moore took a piece of plaster seal and made it into the size and shape of the early stage of foetus and chewed it between the teeth to make it into a '*mudghah*'. He compared this with the photographs of the early stage of the foetus. The teeth marks resembled the 'somites' which is the early formation of the spinal column.

This *mudghah* is transformed into bones ('*idhaam*'). The bones are clothed with intact flesh or muscles (*lahm*). Then





Allah makes it into another creature.

Professor Marshall Johnson is one of the leading scientists in the USA, and is the head of the Department of Anatomy and Director of the Daniel Institute at Thomas Jefferson University, Philadelphia, USA. He was asked to comment on the verses of the Qur'an dealing with embryology. He said that the verses of the Qur'an describing the embryological stages cannot be a coincidence. He said it was probable that Muhammad (ﷺ) had a powerful microscope. On being reminded that the Qur'an was revealed over 1400 years ago and that microscopes were invented centuries after the time of Prophet Muhammad (ﷺ), Professor Johnson laughed and admitted that the first microscope invented could not magnify more than 10 times and could not show a clear picture.

Later he said, "I see nothing here in conflict with the concept that Divine intervention was involved when Muhammad (ﷺ) recited the Qur'an."

According to Dr. Keith Moore, the modern classification of embryonic development stages that is adopted throughout the world is not easily comprehensible, since it identifies stages on a numerical basis, i.e. stage I, stage II, etc. The divisions revealed in the Qur'an are based on distinct and easily identifiable forms or shapes, which the embryo passes through. These are based on different phases of prenatal development and provide elegant scientific descriptions that are comprehensible and practical.

Similar embryological stages of human development have been described in the following verses:



﴿الَّذِي بَكَ نُطْفَةٌ مِنْ مَنِيِّي ثُمَّ كَانَ عَلَقَةً فَخَلَقَ فَسَوَّى ﴿٣٨﴾ فَعَمَلَ مِنْهُ الذَّكَرَ وَالْأُنثَى ﴿٣٩﴾﴾

Was he not a *nutfah* (mixed drops of male and female sexual discharge) emitted (poured forth)? Then he became a '*alaqah* (a clot); then [Allah] shaped and fashioned [him] in due proportion, and made of him two sexes, male and female. (Qur'an 75:37-39)

﴿يَا أَيُّهَا الْإِنْسَانُ مَا غَرَكَ بِرَبِّكَ الْكَرِيمِ ﴿٦﴾ الَّذِي خَلَقَكَ فَسَوَّاكَ فَعَدَلَكَ ﴿٧﴾ فِي أَيِّ صُورَةٍ مَا شَاءَ رَكَّبَكَ ﴿٨﴾﴾

O man! What has made you careless about your Lord, the Most Generous, Who created you, fashioned you perfectly, and gave you due proportion, in whatever form He willed He put you together. (Qur'an 82:6-8)

## Embryo Partly Formed and Partly Unformed

At the *mugdhah* stage, if an incision is made in the embryo and the internal organ is dissected, it will be seen that most of them are formed while the others are not yet completely formed.

According to Professor Johnson, if we describe the embryo as a complete creation, then we are only describing that part which is already created. If we describe it as an incomplete creation, then we are only describing that part which is not yet created. So, is it a complete creation or an incomplete creation? There is no better description of this stage of embryogenesis than the Qur'anic description, "partly formed and partly unformed", as in the following verse:





﴿خَلَقْنَاكُمْ مِنْ تُرَابٍ ثُمَّ مِنْ نُطْفَةٍ ثُمَّ مِنْ عَلَقَةٍ ثُمَّ مِنْ مُضْغَةٍ مُخَلَّقَةٍ  
وَعَرِّىْ مُخَلَّقَةٍ لِّنُبَيِّنَ لَكُمْ﴾

We have created you (i.e. Adam) from dust, then from a *nutfah* (mixed drops of male and female sexual discharge, i.e. the offspring of Adam), then from a clot (a piece of thick coagulated blood) then from a little lump of flesh some formed and some unformed (as in the case of miscarriage) that We may make [it] clear to you (i.e. to show you Our Power and Ability to do what We will). (Qur'an 22:5)

Scientifically, we know that at this early stage of development there are some cells that are differentiated and there are some cells that are undifferentiated, some organs are formed and yet others unformed.

## The Senses of Hearing and Sight

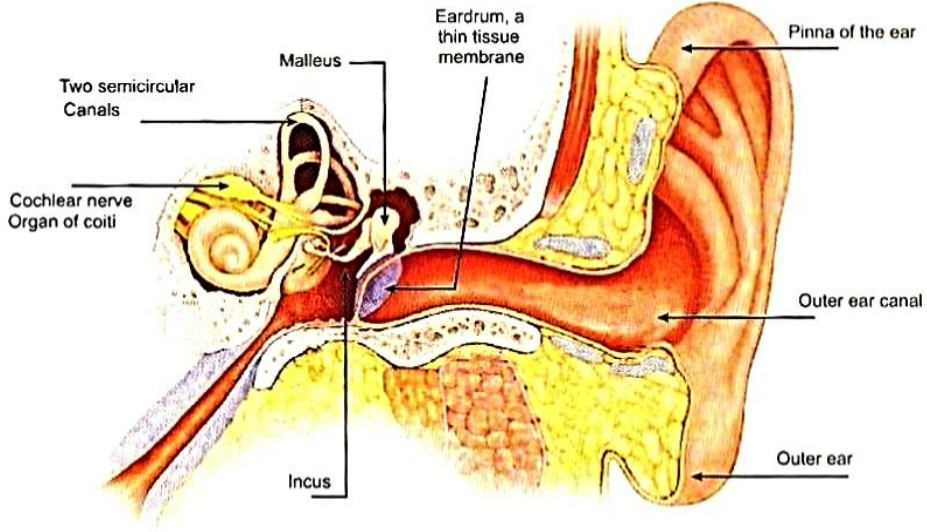
The first sense to develop in a developing human embryo is hearing. The foetus can hear sounds after the 24th week. Subsequently, the sense of sight is developed and by the 28th week, the retina becomes sensitive to light.

Consider the following Qur'anic verses related to the development of the senses in the embryo:

﴿وَجَعَلَ لَكُمُ السَّمْعَ وَالْأَبْصَرَ وَالْأَفْئِدَةَ﴾

And He made for you hearing, vision and hearts (i.e. intellect). (Qur'an 32:9)





﴿إِنَّا خَلَقْنَا الْإِنْسَانَ مِنْ نُطْفَةٍ أَمْشَاجٍ نَبْتَلِيهِ فَجَعَلْنَاهُ سَمِيعًا بَصِيرًا﴾

Verily We have created man from *nutfah* (mixed drops of male and female sexual discharge) in order to try him, so We made him hearer and seer. (Qur'an 76:2)

﴿وَهُوَ الَّذِي أَنْشَأَ لَكُمُ السَّمْعَ وَالْأَبْصَرَ وَالْأَفْئِدَةَ قَلِيلًا مَّا تَشْكُرُونَ﴾

It is He Who has created for you [the sense of] hearing (ears), eyes (sight), and hearts (i.e. understanding). Little thanks you give. (Qur'an 23:78)

In all these verses the sense of hearing is mentioned before that of sight. Thus the Qur'anic description perfectly matches the discoveries in modern embryology.



## Fingerprints



﴿أَيَحْسَبُ الْإِنْسَانُ أَنْ نَجْمَعَ عِظَامَهُ﴾ ﴿٢﴾ بَلَىٰ قَدَرِينٌ عَلَىٰ أَنْ تُسَوَّىٰ بَنَانُهُ﴾

Does man think that We shall not assemble his bones? Yes, We are Able to put together in perfect order the tips of his fingers. (Qur'an 75:3-4)

The unbelievers argue regarding resurrection taking place after bones of dead people have disintegrated in the earth and how each individual would be identified on the Day of Judgment. Almighty Allah answers that He can not only assemble our bones but can also perfectly reconstruct our very fingertips.

Why does the Qur'an, while speaking about determination of the identity of the individual, speak specifically about fingertips? In 1880, fingerprinting became the scientific method of identification after research done by Sir Francis Golt. No two persons in the world can ever have exactly the same fingerprint patterns. That is the reason why police forces worldwide use fingerprints to identify the criminal.

Over 1400 years ago, who could have known the uniqueness of each human's fingerprint? Surely, it could have been none other than the Creator Himself!

## Pain Receptors present in the Skin

People in the past thought that the sense of feeling and pain was only dependent on the brain. Recent discoveries, however, have proved that there are pain receptors present in the skin without which a person would not be able to feel pain.

When a doctor examines a patient suffering from burn injuries, he verifies the degree of burns by a pinprick. If the patient feels pain, the doctor is happy because this indicates that the burns are superficial and that the pain receptors are intact. On the other hand, if the patient does not feel any pain, this indicates that the burns are deep and that the pain receptors have been destroyed.

The Qur'an gives an indication of the existence of pain receptors in the following verse:

﴿إِنَّ الَّذِينَ كَفَرُوا بِآيَاتِنَا سَوْفَ نُصْلِيهِمْ نَارًا كُلَّمَا نَضِجَتْ جُلُودُهُمْ بَدَّلْنَاهُمْ جُلُودًا غَيْرَهَا لِيَذُوقُوا الْعَذَابَ إِنَّ اللَّهَ كَانَ عَزِيزًا حَكِيمًا﴾

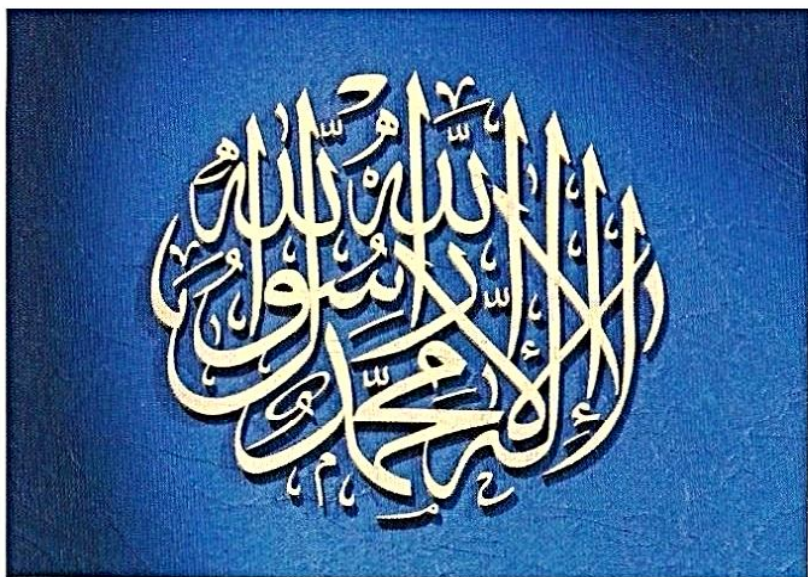
Surely, those who disbelieved in Our signs, We shall burn them in Fire. As often as their skins are roasted through, We shall change them for other skins that they may taste the punishment. Truly, Allah is Ever Most Powerful, All-Wise.

(Qur'an 4:56)





Professor Tagatat Tejasen, Chairman of the Department of Anatomy at Chiang Mai University in Thailand, has spent a great amount of time on research of pain receptors. Initially he could not believe that the Qur'an mentioned this scientific fact over 1400 years ago. He later verified the translation of this particular Qur'anic verse. Professor Tejasen was so impressed by the scientific accuracy of the Qur'anic verse that at the 8th Saudi Medical Conference on the Scientific Signs of Qur'an and *Sunnah* held in Riyadh, he publicly proclaimed:



لَا إِلَهَ إِلَّا اللَّهُ مُحَمَّدٌ رَّسُولُ اللَّهِ

“There is no god but Allah and Muhammad is His Messenger.”



# Conclusion

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To attribute the presence of scientific facts in the Qur'an to coincidence would certainly be against common sense and the true scientific approach. The Qur'an invites all humans to reflect on the creation of this universe in the verse:

﴿إِنَّ فِي خَلْقِ السَّمَوَاتِ وَالْأَرْضِ وَاخْتِلَافِ اللَّيْلِ وَالنَّهَارِ لَآيَاتٍ لِأُولِي  
الْأَلْبَابِ﴾

Verily, in the creation of the heavens and the earth, and in the alternation of night and day, there are indeed signs for men of understanding. (Qur'an 3:190)

The scientific proofs of the Qur'an clearly prove its Divine origin. No human could have produced a book, over fourteen hundred years ago, that would contain profound scientific facts to be discovered by only humankind many centuries later.

The Qur'an, however, is not a book of science but a book of 'signs'. These signs invite man to realize the purpose of his existence on earth, and to live in harmony with nature. It is essentially a book of guidance that guides mankind to the Truth and to the Lord of the worlds who alone deserves to be worshipped. The Qur'an is truly a message from Allah, the Creator and Sustainer of the universe. It contains the same message of the Oneness of God, that was preached by all prophets, right from Adam, all through Moses and Jesus to Muhammad (peace be upon them).

Several detailed tomes have been written on the subject of Qur'an and modern science and further research in this field





is on. *In shaa' Allaah* (if Allah wills), this research will help mankind to come close to the Word of the Almighty. This booklet contains only a few of the scientific facts present in the Qur'an. I cannot claim to have done full justice to the subject.

Professor Tejasen accepted Islam on the strength of just one scientific 'sign' mentioned in the Qur'an. Some people may require ten signs while some may require hundred signs to be convinced about the Divine origin of the Qur'an. Some would be unwilling to accept the Truth even after being shown a thousand signs. The Qur'an condemns such a closed mentality in the verse:

﴿صُمُّوا بِكُمْ غَمٌّ فَهُمْ لَا يَرْجِعُونَ﴾

They are deaf, dumb and blind, so they return not [to the Right Path]. (Qur'an 2:18)

The Qur'an contains a complete code of life for the individual and society. *Alhamdulillah* (praise is to Allah), the Qur'anic way of life is far superior to all the 'isms' that modern man has invented out of sheer ignorance. Who can give better guidance than the Creator Himself?

I pray that this humble effort is accepted by Allah, to Whom I pray for mercy and guidance. (Amen)