MODERN PERSPECTIVE OF LIFE SCIENCE IN THE GLORIOUS QUR'AN: SYNTHESIS AND ANALYSIS OF MUSLIM SCHOLARS VIEWS

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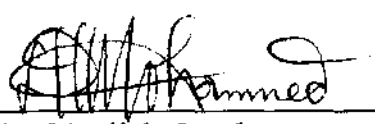
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DECEMBER, 2012.

DECLARATION

I hereby declared that this thesis titled: **"MODERN PERSPECTIVE OF LIFE SCIENCE IN THE GLORIOUS QUR'AN: SYNTHESIS AND ANALYSIS OF MUSLIM SCHOLARS VIEWS"** has been written by me and that it is the record of my own research work. It has not been presented in any previous application for a Higher Degree. All quotations are distinguished by quotation marks and the sources are specifically acknowledged by means of references.



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25/4/13

Date

CERTIFICATION

This Thesis titled: **"MODERN PERSPECTIVE OF LIFE SCIENCE IN THE GLORIOUS QUR'AN: SYNTHESIS AND ANALYSIS OF MUSLIM SCHOLARS VIEWS"** meets the regulations governing the award of the degree of Ph.D in (Islamic Studies) of Ahmadu Bello University, and is approved for its contribution to knowledge and literary presentation.

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ABSTRACT

The research work titled "Modern Perspective of Life Science In the Glorious Qur'an: Synthesis and Analysis of Muslim Scholars Views" is an attempt to highlight the Divine Literature and some ideas of modern scientists on areas related to animals, human embryology, and plants. The objectives of the study are to point out some scientific miracles of the Glorious Qur'an connected to Life Science and how it is compatible to it. The significance of the research is to justify the saying of Allah (SWT) in the Qur'an that "Nothing have We omitted from the book" (Q6:38). The researcher reviewed the Literature using the primary and secondary sources. The Qur'anic verses, Ahadith of the Prophet (S.A. W) and books of Tafsir (Qur'anic commentaries) were used as primary sources. The textbooks, journals, conference and seminar papers and data from internet were used as secondary sources. The major topics touched include the relationship between Qur'an and science, the nature of animals, human and plants' creation, man's sensory organs and acquisition of soul, ecosystem and its component parts, among other things. This study does not require the use of statistical analysis, because it is not experimental in nature. The study found that there are compatibility between some aspects of Life Science and the Glorious Qur'an in modern perspective.

ABBREVIATIONS USED

A.B.U	Ahmadu Bello University, Zaria
A.H	After Hijrah
A.S	Alaihis-Salam
B.C	Before Christ
B.S.L	Britannica Students' Library
C.E	Christian Era
d	Died (year of death of the person mentioned)
D.N.A	Deoxyribonucleic Acid, which determines all hereditary characteristics
e.t.c	etcetera
Ibn	Son
I.V.F	In-vitro fertilization
Kg	Kilogramme
n.d	No date (of publication)
pp.	Pages
Q	Qur'an, for instance Q6:38 means chapter 6 of the Qur'an, verse number 38
R.A	Radiyallahu anhu/anha/anhum
S.A.W	Sallallahu Alaihi Wa Sallam
U.S.A	United States of America
U.D.U.S	Usmanu Danfodio University, Sokoto
F. A. O.	Food and Agricultural Organization

OPERATIONAL DEFINITION OF TERMS

Abiotic – Environmental conditions that help in one way or the other to the survival of biotic members of ecosystem.

Algae – It is a simple plant with no leaves, stems or roots that grow in or near water.

Anatomy – is the scientific study of the structure of human or animal bodies

Aquatic animals – Animals that are found in bodies of water like seas.

Big-bang – The single large explosion that some scientists suggest created the universe.

Biochemistry – Scientific study of the chemistry of living things.

Biotic – Living organisms such as plants and animals.

Blastocyst – This refers to the change that converts morula into blastocyst.

Blastomeres – A cell form in an early stage of the cleavage of a fertilized ovum.

Botany – Scientific study of plants and their structures

Carnivores – Any animal that eats meat.

Cell – The smallest unit of living matter that can exist on its own

Centipede – A small creature like an insect with a long thin body and many legs.

Chlorophyll – The green substance in plants that absorbs light from the sun to help them grow.

Chromosome – One of the very small parts like thread in the nuclei of animal and plant cells that carry the genes.

Coccyx – The small bone at the bottom of the spine.

Compatibility – Two things having relationship between them

Crustacean – Any creature with a soft body that is divided into sections and a hard outer shell.

Dermatology – Scientific study of skin diseases

Ecosystem – The relationship between living organisms and their physical environment.

Egg donation – It is a process in which a woman gives her eggs as donation to another woman that is in need of a child.

Ejaculatory duct – The duct that causes ejaculation of sperm.

Embryo – The developing human during its early stage of development.

Embryology – It is the scientific study of embryos, or pre-natal development of embryos and fetuses.

Empirical – This is something based on experiment or experience rather than ideas or theories.

Fallopian tube – It is the two tubes in the body of a woman or female animal along which eggs pass from the ovaries to the uterus.

Fertilization – To join sperm with an egg so that a baby or young animal develops.

Foetus/fetus – The developing human is called foetus after its embryonic period, i.e after the 8th week (of pregnancy).

Geneology – It is the study of family history, including the study of who the ancestors of a particular person were.

Genetic - Scientific study of the way in which different characteristics are passed from each generation of living things to the next.

Genetic code – It is the arrangement of genes that control how each living thing will develop.

Gonad – A male sex organ that produces sperm or a female sex organ that produces egg.

Habitat – The place where a particular type of animal or plant is normally found.

Herbivores – Any animal that eats only plants such as sheep, cow, etc

Hermaphrodite – A person, an animal or a flower that has both male and female sexual organs or characteristics

Histology - The study of the minute structure of the tissues of organisms.

Inorganic – Not consisting of or coming from any living substance

In-vitro fertilization – It is the fertilization that takes place outside a living body.

Millipede – A small creature like an insect with a long thin body divided into many sections each with two pairs of legs.

Molecule – The smallest unit, usually consisting of a group of atoms into which a substance can be divided without a change in its chemical nature.

Morula – This is a solid mass of 12 to about 32 blastomeres which is formed by cleavage of a zygote.

Organism – This refers to a living thing especially one that is extremely small.

Ovaries – Either of the two organs in a woman's body that produce eggs.

Ovum – It is a female cell of an animal or a plant that can develop into a young animal or plant when fertilized.

Ornithology – The scientific study of birds.

Paleonthologists – Those who study fossils, i.e remains of animals or plants in rocks.

Pathology – It is the scientific study of diseases

Physiology – The scientific study of the normal functions of living things.

Pollination – Is the process of putting pollen into a flower so that it produces seeds.

Post-natal – This is the period after birth and the changes associated with that.

Pre-natal – It is the main developmental changes occurring before birth

Reproduction – Is the formation of new separately existing individuals, that is a species from members already in existence.

Retina – Back of the eye where light falls on the nerve endings.

Somite – A body segment of vertebrate embryo or of a segmented invertebrate embryo.

Sonograph – It is an instrument for scanning and reading sound and its component frequencies.

Soul – It is the spiritual part of a human being that is best known by Almighty Allah (i.e how it is).

Surrogate – A woman who gives birth to baby for another mother who is unable to give birth by herself.

Universe – It refers to the whole of space and everything in it such as the earth, the planets and the stars.

Ultra–sound – A medical process that produces an image of what is inside one's body.

Womb – It is the organ in woman and female animals in which babies develop before they are born.

Zoology – It is the scientific study of animals

Zygote – It is the beginning of a new human beings, i.e an embryo.

ARABIC WORDS

Ajwa – This is one of the varieties of dates recommended by the Prophet (S.A.W)

'Alaqah – It is the second developmental stage in human beings. It is derived from the word *Ilaq* which means to cling and attach to something. It is a leech like in shape.

Balah – This is also one of the varieties of dates.

Harth – It is an act of planting when sperm is released in the woman's vagina.

'Izam – It is the plural of 'azm' i.e bone. It is the fourth stage of human development in which bones begin to form.

Lahm – This is the fifth stage of human development in which muscle flesh cloth the bones.

Muḍghah – It is the third stage of human development in which an embryo looks like a chewed substance.

Nash'ah – It is the last stage in embryonic development. It means to initiate, to rise and increase, to grow and develop.

Nuṭfah – This is the first stage of embryonic development which signifies a minute quantity of sperm, a small drop of water.

Ṣahihayn – Two authentic collections of Hadith by Bukhari and Muslim.

Sulālah – It is the selection of male and female fluid

Taqdeer – Genetic mixture that determines the characteristics of the child.

Tamr – It is one of the variety of dates commonly found in Arabian lands.

TABLE OF TRANSLITERATION

Arabic Letters	Transliteration	Names of Letters
ا	alif	a
ب	baa	b
ت	taa	t
ث	tha	th
ج	jim	j
ح	Haa	ḥ
خ	Kha	kh
د	Dal	d
ذ	Dh	dh
ر	Ra	r
ز	Zay	z
س	Seen	s
ش	sheen	sh
ص	Sad	ṣ
ض	Dad	d
ط	Ta	ṭ
ظ	Za	ẓ
ع	Ain	‘

غ	Ghain	gh
ف	Fa	f
ق	Qaf	q
ك	Kaf	k
ل	Lam	l
م	Mim	m
ن	Nun	n
ه	Ha	h
و	waw	w
ي	Yaa	y

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CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Literally, the word Qur'an according to Hanifi (1962:2) is derived from the root 'qara'a' which means 'he collected together'. It also signifies 'he read' or 'recited', because in reading and reciting, letters and words are joined to each other. It is called Qur'an because it is a collection of all best religious teachings and because it is a book that is or should be read. Technically, Qur'an refers to the words of Allah revealed through the Holy Spirit (Angel Jibril) to the last Messenger of Allah, Muhammad (SAW), for the guidance of mankind.

Doi (1969:31) mantains that the Qur'an is the first primary source of Islam which encompasses the Muslim code of life. Its revelation took a period of twenty-three years in Makkah and Madinah, when there was literary revolution then. The Arabs were very proud in composing poems of varying lengths. Poets and orators were considered not only as genius but also as Jinns possessing supernatural powers. When the Qur'an was

revealed, it excelled the best of their compositions which were charming and arresting. It quickly drew the attention of the audience when recited. All that was fundamental in previous revelations and what are still needed today has been reaffirmed by the Qur'an.

Ibn Kathir (2003:157-158) highlights that the Qur'an has offered three challenges by which it proves to be miraculous. These challenges were stated in the following order:

﴿ قُل لَّئِنِ ٱجْتَمَعَتِ ٱلْإِنسُ وَٱلْجِنُّ عَلَىٰٓ أَن يَأْتُوا۟ بِمِثْلِ هَٰذَا ٱلْقُرْءَانِ لَا يَأْتُونَ
بِمِثْلِهِۦ وَلَوْ كَانَ بَعْضُهُمْ لِبَعْضٍ ظَهِيرًا ﴿٨٨﴾ ﴾

Say: if mankind and the Jinn gathered together in order to produce the like of this Qur'an, they could not produce the like of it, even if they were to each other assitants. (al-Isra, Q17:88)

The above verse throws a challenge to all mankind to produce something similar to the Qur'an. None produced the like of the Qur'an by the time this verse was revealed and none will be able to produce it presently and in the future. The second challenge is pointed in the following verse:

﴿ أَمْ يَقُولُونَ ٱفْتَرَىٰهُ ۖ قُلْ فَأْتُوا۟ بِعَشْرِ سُوَرٍ مِّثْلِهِۦ مُفْتَرَيَٰتٍ وَٱدْعُوا۟ مَنِ
ٱسْتَطَعْتُم مِّن دُونِ ٱللَّهِ إِن كُنتُمْ صَٰدِقِينَ ﴿١٣﴾ ﴾

Or do they say, "He invented it."? Say, "Then bring ten surahs like it that have

been invented and call upon (for assistance) whomever you can beside Allah, if you should be truthful".

(Hud, Q11:13)

The above verse indicates another challenge to mankind to produce only ten chapters similar to the Qur'an. This was not possible in view of the fact that the Qur'an is inimitable. The last challenge is stated thus:

﴿ وَإِن كُنتُمْ فِي رَيْبٍ مِّمَّا نَزَّلْنَا عَلَىٰ عَبْدِنَا فَأْتُوا بِسُورَةٍ مِّن مِّثْلِهِ وَادْعُوا شُهَدَاءَكُم مِّن دُونِ اللَّهِ إِن كُنتُمْ صَادِقِينَ ﴿٢٣﴾ ﴾

And if you are in doubt about what We have sent down (i.e the Qur'an) upon our servant (i.e Prophet Muhammad S.A.W.) Then produce a surah the like thereof and call upon your witnesses (i.e supporters) other than Allah, if you should be truthfull.

(al-Baqarah, Q2:23).

The last verse above indicates that mankind are challenged to produce only one chapter similar to Qur'an, which they failed. The failure to produce the complete Qur'an, ten of its chapters, or only one chapter shows that it is beyond the intelligence of mankind and it can never be imitated.

The Qur'an by its miraculous nature contains a vast pool of knowledge. The first revealed verses of the Qur'an in Surah al-'Alaq are stated as follows:

﴿ ٱقۡرَأۡ بِٱسۡمِ رَبِّكَ ٱلَّذِي خَلَقَ ۝١ خَلَقَ ٱلۡإِنسَٰنَ مِنۡ عَلَقٍ ۝٢
ٱقۡرَأۡ وَرَبُّكَ ٱلۡأَكۡرَمُ ۝٣ ﴾

Recite in the name of your Lord Who created. Created man from a clinging substance. Recite, and your Lord is the most Generous. Who taught by the pen.
(al-'Alaq, Q96:1-4)

Al-Mahalli *et al* (1431A.H:1746) stated that the above verses have shown that the Creator of the entire creation is the Almighty Allah Who created man from clot. To read is the first commandment of Allah (SWT) to His Messenger, Muhammad (S.A.W), mentioned in the first verse of the first revelation. Allah (S.W.T) taught man how to write with pen. The first person to write was Prophet Idris (A.S).

The verses above also focus on seeking knowledge and the need to realize the existence of man's Creator. One of the aspects of knowledge taught by the Qur'an has to do with Life science. On this, many scientists have made discoveries which

are compatible with some Qur'anic verses. This study therefore focuses on the following:

Evolution is one of the major issues treated under the Literature reviewed. It has to do with the processes and stages by which the Almighty Allah created things. The emphasis was placed on animals human beings and plants because the whole study concentrates fully on them. It is indicated that evolution is a continuous process according to plan and that each stage covers thousands of years. Under this, the researcher established that the creation of animals, human beings and plants did not happen by chance or co-incidence, as claimed by some evolutionists such as Darwin (d.1882 C.E).

Human creation and development was explained in chapter two of this research. It is indicated under this that, man has undergone three formative processes – the spiritual process (when he was originally created from dust), the biological or reproduction process, which happens as a result of sexual contact between a man and a woman. On this, the researcher explained six developmental stages man undergoes under embryological process. The last process undergone by

man, has to do with man's physical development after birth (including the childhood, youthhood, adulthood and decay stages). All these were explained in the context of Qur'an and some highlights from modern scientists.

The researcher also elaborated on the creation of animals which live in communities and habitats as the Qur'an pointed. Animals' creation benefits man in so many ways. Their benefits like carrying luggages, serving as sources of food to man, used for beautification of the environment and the like were pointed out. Some miracles of animals' creation were also treated. For instance the excreter of the bees (honey) which is very sweet has medical value. Other animals the Qur'an mentioned, such as the cows, the ants, the camels and the birds were analyzed.

Another area of focus of the study deals with human sensory organs. Allah has endowed man with the sense of hearing, sight, touch, smell and taste to enable him perceive and conceive things and to serve his Creator according to His dictates.

Botany is one of the major issues explained. The nature and importance of creating plants, the role of rain water in relation to the growth of plants, chlorophyll in plants, pollination and its classification, nature of reproduction in the plant kingdom, nature of fruits and other issues were highlighted with reference to different chapters of the Qur'an.

1.2 Statement of the Problem

The Glorious Qur'an is not a book of Anatomy, Astronomy, Biology, Chemistry, Geology or other natural science subjects. Nevertheless, it contains some scientific facts, so that people can learn from those facts and believe that this Glorious Book is from Almighty Allah (SWT). The Qur'an is meant to guide people on their personal and public lives, social and moral issues which relate to their daily lives and their relationship with the Creator. Fazlulkarim (1938:1) pointed that, the Qur'an stands unique and unrivalled, because it remains in pure and unadulterated form, devoid of corruption of human hands.

Muslims believed that the Qu'ran was revealed by Allah (The Infallible). This fact has been persistently denied by some

western writers, especially the orientalists, who claimed that, it was Muhammad (S.A.W) who composed the Qu'ran with or without the help of other people. According to Khalifah (1983:10) no supporting evidences were given in this regard. Bucaille (1986:132) also laments that some western writers expressed their negative views that, the Qu'ran was authored by Prophet Muhammad (S.A.W.).

The Glorious Qur'an is a Divine book that was revealed for the guidance of mankind. Allah (SWT) has attested to this fact where He says:

﴿ تَنزِيلٌ مِّنَ ٱلرَّحْمَٰنِ ٱلرَّحِيمِ ۝١ كِتَٰبٌ فُصِّلَتْ ءَايَٰتُهُۥ قُرْءَانًا عَرَبِيًّا لِّقَوْمٍ يَعْلَمُونَ ۝٣ بَشِيرًا وَنَذِيرًا فَأَعْرَضَ أَكْثَرُهُمْ فَهُمْ لَا يَسْمَعُونَ ۝٤ ﴾

(This is) a revelation from the entirely Merciful, the Especially Merciful. A Book whose verses have been detailed, an Arabic Qur'an for a people who know. As a giver of good tidings and a warner, but most of them turn away.

(al-Fussilat, Q41:2-4)

In another verse, Almighty Allah states:

﴿ وَمَآ أَنزَلْنَا عَلَيْكَ ٱلْكِتَٰبَ إِلَّا لِتُبَيِّنَ لَهُمُ ٱلَّذِى ٱخْتَلَفُوا۟ فِيهِ ۙ وَهُدًى وَرَحْمَةً لِّقَوْمٍ يُؤْمِنُونَ ۝٦٤ ﴾

And We have not sent down the Book to you, except that you may explain

clearly unto them those things in which they differ, and (as) a guidance and a mercy for a folk who believe.
(an-Nahl, Q16:64)

The verse above explained the nature of the Qur'an that was revealed to the Messenger of Allah (S.A.W) to explain it to people to understand the revelation. Its revelation was in Arabic so that the Arabs and other people would understand it. Allah (SWT) revealed the Qur'an by sending Angel Jibril (A.S) to Prophet Muhammad (S.A.W). By mere reading the Qur'an, it would be understood that its contents is beyond the wordings of man.

In the lifetime of the Prophet (S.A.W), there were some section of people such as Abu Sufyan, Nadar, Utba, Shayba, Abu Jahl and Walid bn Mughirah who had conversation when they heard the Prophet (S.A.W) reciting the Qur'an. These people regarded the Prophet (S.A.W) as crazy, poet, magician and have given him all sorts of names that did not befit him. According to al-Khader (1426 A.H:41), Walid has acknowledged that the Qur'an was neither the words of man nor of Jinn, but still regarded the Prophet as a magician who

came to divide between a man and his brother and wife, and between a man and his clan. It was the conversation of the above people that led to the revelation of the following verse according to Zamakshari (1385A.H:179).

﴿ ذَرْنِي وَمَنْ خَلَقْتُ وَحِيدًا ﴿١١﴾ وَجَعَلْتُ لَهُ مَالًا مَّمْدُودًا ﴿١٢﴾
وَبَنِينَ شُهُودًا ﴿١٣﴾ ﴾

Leave Me with the one I created alone. And to whom I granted extensive wealth. And children present (with him).
(al-Muddathir, Q74:11-13)

Some orientalists such as Sir William Muir (1989), Margoliouth and others, according to Qadhi (1999:297) claimed that, it was Bahirah, the Christian monk whom Prophet Muhammad (S.A.W) met in Syria that assisted him to compose the Qur'an. Khalifah (1983:10) states that orientalists such as Wollaston (1905), Lammens (1926), Champions and Short (1959), Glubb (1970) and Rodinson as late as (1977) only reiterated this logically unfounded assumption that an unnamed source assisted Prophet Muhammad (S.A.W) to concoct the Qu'ran. Rodinson (1977)

regarded the Qur'an as a poem stored upon in Muhammad's unconscious minds.

All the above claims and views of the orientalists are baseless, because they are only meant to discredit the prophethood of Muhammad (S.A.W) and the authority of the Qur'an. This is a problem that calls for the need to conduct a research to prove the authenticity of the Qur'an in the light of modern scientific knowledge and refute the claims of the orientalists.

Another issue of concern that necessitated this research has to do with the concept of evolution. Charles Darwin's evolutionary theory postulated in 1889 states that, living organisms reproduce more than enough offspring that the environment cannot cater for. Therefore, some that cannot withstand harsh environmental conditions such as shelter and food may die before maturity. If they are many, they could not meet up with shelter and other things required for survival, they will die. The environment will select the organisms that will survive in that habitat. According to Yahaya (1980:194),

Charles Darwin upheld the view that living species come into existence by chance and coincidence.

The ideas of Charles Darwin are taught to science students in our schools. It has alot of implications to Muslim students who study Biology, especially at under-graduate and post-graduate levels of education. The faith of some weaker Muslims students may be adversely affected, if the above theory is taught to them, especially those who do not have sound Islamic knowledge. In this regard, Lemu (1980:7) points out that it is only the rare students who have the breadth of knowledge or the critical faculty to sort out their belief and ideas in consistent manner that will be free of this problem. There is need therefore, to explain how Almighty Allah created the universe and certain things it subsumes, in the perspective of Islam, to refute the claim that certain things were created by chance or co-incidence.

Almighty Allah enjoins Muslims to marry, so as to procreate. Without the marriage institution, there would be problem of human extinction. Through marriage, Allah blesses the married couples with male or female children or both and

sometimes none of two is given. Under this situation, some Muslims may be tempted to opt for In-vitro fertilization, egg donation and the like, with the aim of having an issue. This may be a serious problem to them and the community. The practice of the above mentioned issues may be possible among the contemporary Muslims, probably due to the advancement of technology in our contemporary time. Such are problems that have to do with embryology and gyneacology, that may be contrary to the teachings of the Glorious Qur'an and Hadith (being the primary sources of Islamic Law). There is need to expound Islamic views on these.

1.3 Objectives of the Study

The following are objectives of the study:-

1. To find out the relationship between the Glorious Qur'an and modern Science.
2. To find out some areas of compatibility between modern science and Qur'an on plants and animals.
3. To pin-point some of the scientific miracles of the Qur'an on human embryology.

4. To state the significance of human sense organs and related issues mentioned in the Qur'an.
5. To explain the position of Islam on modern practices (In-vitro fertilization and egg donation) related to human reproduction.
6. To highlight on the compatibility of the ecosystem and the Glorious Qur'an.
7. To elucidate on the significance of studying Life Science to the Muslims.

1.4 Research Questions:

The researcher hopes to answer the following research questions related to the scope of the study:

1. Are there relationships between Qur'an and Science?
2. What are the areas of compatibility between Modern Science and Qur'an on animals?
3. To what extent is Modern science compatible with Qur'an on plants?
4. What are the scientific miracles of the Qur'an in relation to human embryology?
5. Of what importance are the sense organs to human beings?

6. What is the position of Islam on In-vitro fertilization and egg donation?
7. What are the compability of Modern Science and Qur'an on Ecosystem?
8. What are the relevance of studying Life Sceince by Muslims?

1.5 Significance of the Study

This study would be very significant in the sense that it would help to justify the saying of Allah in the Qur'an that "*Nothing have We omitted from the Book...*" (Q6:38). In other words, Life science is an aspect of knowledge contained in the Qur'an in numerous passages. The Qur'an deals with the Islamic belief systems, pillars of Islam, politics, economic affairs, social and moral teachings, and in fact all facets of life. The study is mainly conducted in order to add to the existing knowledge on the compatibility of Life Science and Qur'an.

The researcher hopes to explain issues related to the creation of animals from the Qur'anic and Scientific perspectives. It is hoped that those who read the research report would be able to explain the nature of animals in relation to Science and Qur'an, the nature of their movement,

categories as well as their benefits to humanity. This helps them to understand the relationship between modern science and some Qur'anic verses.

The study would be very significant also, in that it will shed more light on the origin of man whom Almighty Allah created from sounding clay and later changed the nature of his creation to biological process (when the male and female mate) to produce offsprings. The distinct embryological stages of human creation would be elucidated with quotations from the Glorious Qur'an and Ahādith. The researcher would also point out some of the developmental stages man undergoes after his birth, as mentioned in the Qur'an. All these would greatly educate those who read the research report.

Another significance of the study is that it would help in understanding the nature of plants creation and their values to animals and human beings. In other words, the relationship between the biotic and abiotic components of the ecosystem would greatly help to understand the wonderful nature of Allah's creation, which increases the faith of Muslims.

In addition, the findings of this study could be used in carrying Da'awah (propagation of Islamic teachings). The findings of the research could be used to teach non-Muslims to understand that some verses of the Qur'an, revealed in the desert in the 7th century C.E correspond with some scientific facts discovered in the last two to three centuries. This could lead to increasing the number of Muslims. For instance, Naik (2001:67) indicates that Professor Tejasan, the Chairman of the Department of Anatomy at Chiang Mai University in Thailand accepted Islam as a result of the research he conducted on pain receptors of man. He realized that these pain receptors scientifically are related to a verse of the Qur'an which says:

﴿ إِنَّ ٱلَّذِينَ كَفَرُوا۟ بِـَٔايَـٰتِنَا سَوْفَ نُصْلِيهِمْ نَارًا كُلَّمَا نَضِجَتْ جُلُودُهُم بَدَّلْنَـٰهُمْ جُلُودًا غَيْرَهَا لِيَذُوقُوا۟ ٱلْعَذَابَ ۗ إِنَّ ٱللَّهَ كَانَ عَزِيزًا حَكِيمًا ﴿٥٦﴾ ﴾

Indeed, those who disbelieve in our verses- We will drive them into a fire. Every time their skins are roasted through, We will replace them with orther skins so they may taste the punishment. Indeed, Allah is ever exalted in Might and Wise.

(an-Nisa'i Q4:56).

This therefore, convinced him to accept Islam during the 8th Saudi Medical Conference held in Riyadh on the scientific signs of Qur'an and Sunnah.

Furthermore, the researcher hopes that the analysis and findings presented in the study will benefit Muslim teachers and students of Islamic Studies, especially in the higher institutions of learning, particularly at the post-graduate level. Further researches related to this study such as the compatibility of Medicine, Agricultural Science, Chemistry, Physics and Geography and the Glorious Qur'an etc can be conducted by teachers and students. The teachers may use the findings presented in this research as a source of reference when writing some topics related to Life science in Islam. The findings also presented could strengthen the faith of some Muslims based on what is presented as scientific miracles of the Qur'an. This is because Prophet Muhammad (S.A.W) did not author or compose the Qur'an. If he was the person who composed it, how did he come to know the numerous scientific facts in it, at the desert in the 7th century C.E, and some of which are discovered in the last two to three centuries by

scientists? To contemplate on the creation of the Universe and what are contained in it is encouraged by the Qur'an. Hence taking interest in Science is very important form of worship. In Surah Ali-Imran (Q 3: 190), Allah states:

﴿ إِنَّ فِي خَلْقِ ٱلسَّمَٰوَٰتِ وَٱلْأَرْضِ وَٱخْتِلَٰفِ ٱلَّيْلِ وَٱلنَّهَارِ
لَءَايَٰتٍ لِّأُو۟لِى ٱلْأَلْبَٰبِ ﴿١٩٠﴾ ﴾

Indeed, in the creation of the heaven and the earth and the alternation of the night and the day are signs for those of understanding.

This verse teaches Muslims that the creation of natural phenomena such as the heavens and the earth are meant to instill in man to be curious and inquisitive as to why they were created and to have firm belief in their Creator.

1.6 Basic Assumptions of the Study:

The following are the basic assumptions of the study:

1. There is no contradiction between the Glorious Qur'an and Science.
2. True reasoning does not contradict the verses of the Qur'an.

1.7 Scope and Delimitation of the Study:

Life Science in the Qur'an is very broad in nature, for volumes of books and research works can be written on it. Therefore, this study examines some aspects of Life Science in the Qur'an. Some aspects of Animals science, human embryology and plants science are the major issues that were studied.

Under animals, the topics touched upon include the concept of evolution and its periods, the animals' creation and their wonderful nature. Their categories, behaviors and their importance to man were examined.

Another aspect of the study is man. The nature and developmental stages of his creation as it relates to embryology, the sense organs and other related issues and what the Qur'an says on them, among other things were highlighted.

Regarding plants, the researcher expounded on things like the blessings and uses of the plants, how reproduction takes place in the plant kingdom, the role of rain and water in the growth of plants, etc.

Moreover, the researcher also analysed the compatibility of ecosystem and its component parts and the Qur'an, some areas of relationship between Qur'an and Science, and what influenced the early Muslims to study science and the relevance of studying Life Science by the Muslims.

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CHAPTER TWO
LITERATURE REVIEW

2.0 Introduction

The work reviewed related Literature on different topics such as definition of science, the relationship between Qur'an and Science, the idea of human and animals' evolution, evolutionary periods, biological aspects of human growth and development, the Qur'an and human sensory organs, the nature of human soul, the science of human embryology and its stages, reproduction and fertilization in the animal kingdom, the concept of In-vitro fertilization, zoological literature from the Qur'an, and so forth.

The second aspect of the study reviewed literature related to plants. Under it, the uses of plants, plants mentioned in the Qur'an, the role of rain water in the growth of plants were also reviewed.

2.1 Definition of Science

The word science is defined in various ways by various scholars, from the Western and Islamic perspectives. Isokun (2003:117) citing Kemeny (1959:12) defines science as, "a body

of knowledge obtained through systematic observation and experiment which allows the deduction of laws and principles". Any knowledge acquired by means of scientific method according to Kemeny is regarded as science.

The primary meaning of science according to Oseni (2005:103) is, "knowledge arranged in orderly manner, especially knowledge obtained by observation and testing of facts".

Hornby (2000:1051) defines science as, "knowledge about the structure and behaviour of natural and physical world based on facts that you can prove for example by experiment".

Lane (1968:2140) defines the term "ilm" being an Arabic word as the equivalent word for knowledge. 'Ilm' is an infinitive noun and its plural in Arabic is "*Ulum*" which signifies the sciences or several species of knowledge. 'Ilm is used to express so many aspects related to knowledge, information, cognition, intellectualism, learning, acquaintance, perception, etc.

According to the dictionary definition, Farah *et al* (2004:109) defined Ilm to mean science, knowledge, learning,

lore, cognition, information, scholarship, education, perception, cognisance, awareness and acquaintance.

Alkhader (2005:83) defines science as, an organized methodological method which acquires the truth from objective observation.

It is very important to state that, the definitions of science above clearly indicate that the scope of science is broad in nature. Science is not restricted to the study of Biology, Chemistry and Physics as some people assume it to be. There are different categories of science. For instance, Nasr (1968:60-64) discusses that al-Farabi (d. 339 A.H) and Ibn Khaldun (d. 808 A.H) classify science into Domestic science, Life science, Political science, Social science, Natural science, physical science, Religious science, and so forth.

Specifically, science refers to "knowledge of nature". In Islam, science embraces all scientific and artistic knowledge by which man will understand his Creator by reflecting on the natural phenomena and all other things that exist. Any aspect of knowledge that does not clash with the basic teachings of Islam is very much regarded and encouraged by the Qur'an.

2.2 The Relationship Between Qur'an and Science

Almighty Allah in the Qur'an encourages Muslims to ponder on the creation of the universe so as to realize His true existence and then serve Him. Pondering on the creation of the universe is related to empirical science. The Qur'an explains man's relationship with his natural environment. For this reason, Islam and science have strong relationship. Jumba (1994:2) opines that, science and other knowledge are part of religion (Islam) and cannot therefore be separated from it. Scientific studies are allowed in Islam. Such knowledge is geared towards obtaining enjoyment here and in the hereafter.

Almighty Allah says:

﴿ وَمَا مِن دَآبَّةٖ فِي ٱلۡأَرۡضِ وَلَا طَٰٓئِرٖ يَطِيرُ بِجَنَاحَيۡهِ إِلَّآ أُمَمٌ أَمۡثَالُكُم مَّا فَرَّطۡنَا فِي ٱلۡكِتَٰبِ مِن شَيۡءٖ ثُمَّ إِلَىٰ رَبِّهِمۡ يُحۡشَرُونَ ٣٨ ﴾

And there is no creature on (or within) the earth, or bird that fly with its wings except that (they are) communities like you. We have not neglected in the Register a thing. Then unto their Lord they will be gathered. (al-An'am, Q6:38).

The above verse indicates that, the Qur'an touches all aspects of life. Therefore, Islam accepts all those laws of

nature explored by scientific researchers, which do not clash with its basic beliefs and thoughts.

For many centuries in the West especially during the middle ages, from 10th to the end of 15th century C.E, the relationship between religion (Christianity) and science has not always been cordial. There was strong opposition to scientific development in Europe by the authorities in question, on their initiative without reference to authentic scriptures. Those who sought to enlarge science then were burnt at stake, some beheaded and others went on exile, to save their necks from monstrous punishment. To examplify this, Wahiduddin (n.d:27) states that, Socrates was forced to commit suicide by poisoning (drinking hemlock) in 399 B.C, Giardano Bruno was burnt at stake, Galileo (d. 1642 C.E) was forced to recant his views, and a Roman soldier struck Archimedes in 212 B.C. while pondering over geometrical problems on the sand.

The attitude of Islam towards science was quite different. For instance, the first revealed verse of the Qur'an in Surah al-'Alaq says:

﴿ ٱقۡرَأۡ بِٱسۡمِ رَبِّكَ ٱلَّذِي خَلَقَ ۝١ خَلَقَ ٱلۡإِنسَٰنَ مِنۡ عَلَقٍ ۝٢ ﴾

Recite in the name of your Lord Who created. Created man from a clinging substance.

(al-Alaq, Q96:1-2).

This verse portrays that Islam started with two fundamental principles of research from its very beginning. Man is commanded, firstly, to read ie to seek or study knowledge in the name of his Lord. In the second aspect of the verse, man is told that it is his Lord Who *'Creates'* –thus calling upon man to ponder over the creation of Allah (the sustainer of the universe).

It is worthy of note to state that, the Qur'an invites Muslims to cultivate science and there are many verses in it that relate to observations of natural phenomena (such as the creation of the solar system, the alternation of day and night, to mention but few).

There is strong relationship between Qur'an and science. The Qur'an states many verses dealing with the nature of rain and its uses, the creation of mountains and their functions, issues related to the seas and rivers, human developmental

stages, the nature of plants and other related issues all of which are compatible to the explanation of modern scientists.

In the same vein, science in the form of cognitive knowledge does not have any conflict with Islamic religion. Soliman (1985:1) elucidates that, Islamic religion is not whatsoever hostile to science, but an inevitable and necessary part of it. To further defend the idea of Soliman above, Albert (1905) a famous physicist and Nobel prize winner says: "Science without religion is lame and religion without science is blind".

Naik (2001:7) points that, the Glorious Qur'an is not a book of science but a book of signs. By implication, any verse of the Qur'an is beyond imitation and is worthy of being reflected upon to understand that it originated from Almighty Allah, the Most High, Who is above making any error.

There is close and balanced relationship between Qur'an and modern science. Many verses of the Qur'an stimulated the early Muslims to study different sciences side by side with Islamic religious Studies. This is the reason why some Muslim scholars between the 9th and 10th centuries according to

Zindani *et al* (2000:3) contributed a lot in scientific fields. For example, Thabit Ibn Qurrah (d. 288/901 C.E) wrote on gravity and its relationship with mass, Abdul-Rahman Ahmad Ibn Yunus (d. 399 A.H./1009 C.E) invented pendulum clock, as a result of his derivation of mathematical relationship between pendular motion and time where he utilized the information that led to the invention of the said clock. Alhassan Ibn Al-Haytham popularly called 'Alhazen' in the west (d. 430 A.H/1039 C.E) became a reknowned physicist scholar during the Middle Ages, etc.

Moreover, the value of knowledge is highly elevated in the Qur'an. This is in view of the fact that the more man acquires knowledge, the more he becomes convinced of the existence of Almighty Allah (the Creator of all). Through different scientific knowledge, man gains faith in Allah. The Qur'an in Surah al-Fātir states:

﴿ وَمِنَ ٱلنَّاسِ وَٱلدَّوَآبِّ وَٱلْأَنْعَٰمِ مُخْتَلِفٌ أَلْوَٰنُهُۥ كَذَٰلِكَ
إِنَّمَا يَخْشَى ٱللَّهَ مِنْ عِبَادِهِ ٱلْعُلَمَٰٓؤُا۟ إِنَّ ٱللَّهَ عَزِيزٌ غَفُورٌ ﴿٢٨﴾ ﴾

And among people and moving creatures and grazing livestock are various colors similarly. Only those

fear Allah, from among His servants, who have knowledge. In deed, Allah is exalted in might and Forgiving.
(al-Fātir, Q35:28).

The above verse shows the significance of acquiring knowledge. The value of knowledge and learned men can well be seen in different Qur'anic verses. The Prophet (S.A.W) according to www.acryfromanhonestsoul.com also taught his Companions some Ahādith related to acquisition of knowledge and the status of learned scholars. For instance, he was reported to have said:

"العلماء ورثة الأنبياء".
The learned are inheritors of the Prophets.
(Mishkat, Vol. 1, P. 343)

طلب العلم فريضة على كل مسلم ومسلمة"
The acquisition of knowledge is a duty incumbent on every Muslim, male and female.
(Mishkat, Vol. 1, Hadith 37, P. 343)

2.3 The Concept of Evolution

Hornby (2000:398) defines evolution as, "the gradual development of animals, plants, etc over many years from simple to more complicated forms". It is also defined as the gradual development of something. These two definitions

clearly indicate that evolution has beginning and it is an on going process.

The revealed books of Allah (SWT) made extensive explanation of how man, animals, and plants were created by the Creator. The concept of creation is mentioned in different Qur'anic verses, such as:

﴿ أَوَلَمْ يَرَوْا كَيْفَ يُبْدِئُ ٱللَّهُ ٱلْخَلْقَ ثُمَّ يُعِيدُهُۥٓ ۚ إِنَّ
ذَٰلِكَ عَلَى ٱللَّهِ يَسِيرٌ ﴿١٩﴾ قُلْ سِيرُوا۟ فِى ٱلْأَرْضِ فَٱنظُرُوا۟
كَيْفَ بَدَأَ ٱلْخَلْقَ ۚ ثُمَّ ٱللَّهُ يُنشِئُ ٱلنَّشْأَةَ ٱلْءَاخِرَةَ ۚ ﴿٢٠﴾ ﴾

Have they not consider how Allah begins creation and then repeats it?. In deed, that for Allah is easy. Say, (O Muhammad), "Travel through the land and observe how He began creation. Then Allah will produce the final creation (i.e, development). Indeed, Allah over all things is competent".
(al-Ankabut, Q29:19-20)

The two verses above mean that, Almighty Allah is the Originator of all creations, and since He is able to initiate the creation of something, then there is no doubt that He can repeat that creation at any given time. One of the attributes of Allah (SWT) is that, He creates whatever He feels like creating

without imitating any one. The name *al-Khaliq* (the Creator) and *al-Bari* (the Maker) as contained in His beautiful names are attributes that are peculiar to Him alone. Allah (SWT) created the heavens and earths in six days. They did not create themselves nor come into existence by co-incidence and chance, but by series of purposive acts.

Wadud (1971:157) hints that, according to the theory of special creation, each kind of animal or plant came into existence in the form in which it exists today. Since life began, change has never occurred and that living species continue to live, as they were initially created. For instance, the nature of human creation, from generation to generation that was ordained by Almighty Allah by means of reproduction, remains as it was before.

The Qur'an contains some ideas that refer to evolution. On the evolution of man for instance, it states that:

﴿ يَٰٓأَيُّهَا ٱلنَّاسُ إِن كُنتُمْ فِي رَيْبٍ مِّنَ ٱلْبَعْثِ فَإِنَّا خَلَقْنَٰكُم مِّن تُرَابٍ
ثُمَّ مِن نُّطْفَةٍ ثُمَّ مِنْ عَلَقَةٍ ثُمَّ مِن مُّضْغَةٍ مُّخَلَّقَةٍ وَغَيْرِ مُخَلَّقَةٍ
لِّنُبَيِّنَ لَكُمْ ۚ وَنُقِرُّ فِي ٱلْأَرْحَامِ مَا نَشَآءُ إِلَىٰٓ أَجَلٍ مُّسَمًّى ثُمَّ نُخْرِجُكُمْ
طِفْلًا ثُمَّ لِتَبْلُغُوٓا۟ أَشُدَّكُمْ ۖ وَمِنكُم مَّن يُتَوَفَّىٰ وَمِنكُم

مَن يُرَدُّ إِلَىٰٓ أَرْذَلِ ٱلْعُمُرِ لِكَيْلَا يَعْلَمَ مِنۢ بَعْدِ عِلْمٍ شَيْـًٔا ۚ وَتَرَى ٱلْأَرْضَ هَامِدَةً فَإِذَآ أَنزَلْنَا عَلَيْهَا ٱلْمَآءَ ٱهْتَزَّتْ وَرَبَتْ وَأَنۢبَتَتْ مِن كُلِّ زَوْجٍۭ بَهِيجٍ ﴿٥﴾

O people, if you should be in doubt about the Resurrection, then (consider that), indeed We created you from dust, then from a sperm drop, then from a clinging clot, and then from a lump of flesh, formed and unformed-that We may show you. And We settle in the wombs whom We will for a specified term, then We bring you out as a child, and then (We develop you) that you may reach your (time of) maturity. And among you is he who is taken in (early) death, and among you is he who is returned to the most decrepit (old) age so that he knows, after (once having) knowledge nothing. And you see the earth barren, but When We send down upon it rain, it quivers and swells and grows (something) of every beautiful kind).

(al-Hajj, Q22:5)

The idea expressed in the above verse is that Allah mentions that the origin of man was initially dust (inorganic substance), mixed with water, then changed to biological process (when man and woman have sexual contact) and their drops of semen and ovum are mixed together and changed to clotted blood and then to flesh of meat, up to the time when a child is born by his mother. It also describes the stages of

growth after birth (infancy, childhood, adolescent and adulthood stages).

The Glorious Qur'an also pointed out the idea of evolution in the plants kingdom. Allah (SWT) creates plants with various colors and their creation is meant to benefit man and animals. The Qur'an says:

﴿ أَلَمْ تَرَ أَنَّ ٱللَّهَ أَنزَلَ مِنَ ٱلسَّمَآءِ مَآءً فَأَخْرَجْنَا بِهِۦ ثَمَرَٰتٍ مُّخْتَلِفًا
أَلْوَٰنُهَا ۚ وَمِنَ ٱلْجِبَالِ جُدَدٌۢ بِيضٌ وَحُمْرٌ مُّخْتَلِفٌ أَلْوَٰنُهَا وَغَرَابِيبُ
سُودٌ ﴿٢٧﴾ ﴾

Do you not see that Allah sends down rain from the sky, And We produce there by fruits of varying colours? And in the mountains are tracks, white and red of varying shades and(some) extremely black. (al-Fatir, Q35:27)

The idea of evolution of plants cannot be possible without water. This is the reason why Allah (SWT) mentions rain water in the above verse. For plants to grow, they must absorb huge quantity of water. Without water life is not possible and water has always been the most important single component of all living matter according Wadud (1971:46). Wherever there is water, life exist in actual or potential form. Life in entirity is of

aquatic origin and according to Bucaille (1989:181), water is the major components of all living cells.

Almighty Allah states about the evolution of the heavens and earth in the Qur'an. Qurṭubi (1423A.H:257), explains that Allah (SWT) asked the unbelievers that do they not have knowledge on the fact that the heavens and earth were initially one big mass before they were separated as shown in this verse:

﴿ أَوَلَمْ يَرَ ٱلَّذِينَ كَفَرُوٓاْ أَنَّ ٱلسَّمَٰوَٰتِ وَٱلْأَرْضَ كَانَتَا رَتْقًا فَفَتَقْنَٰهُمَا ۖ وَجَعَلْنَا مِنَ ٱلْمَآءِ كُلَّ شَىْءٍ حَىٍّ ۖ أَفَلَا يُؤْمِنُونَ ﴿٣٠﴾ ﴾

Have those who disbelieved consider that the heavens and the earth were a joined entity, and We separated them and made from water every living thing? Then will they not believe?

(al-Anbiya, Q21:30).

Abdullahi Ibn Abbas (d.68A.H), ad-Ḍahhak (d. 212A.H) and Qatāda (d.117A.H) were of the view that, the heaven and earth were initially one entity, then Almighty Allah separated them. Ka'ab (d.52A.H) on the other hand, maintains that Allah (SWT) created the heavens and earth one part on top of another, then He created wind in their midst and used it to

separate them. He then made the seven heavens and earths. According to Abu Salih (d.40A.H) and Mujāhid (d. 103A.H), the heaven happened to be one united piece, but it was parted (separated) into seven heavens. The earth was also one united piece, but was later separated into seven earths. This is close to the Big bang theory in modern science.

Qatbi reported from Isma'il bn Abi Khalid (d. 186A.H) on the saying of Allah, the Wise and Majesty in relation to the above verse (Q21:30). He stated that the heaven was initially created in single entity, likewise the earth. Almighty Allah later separated them (heavens and earth) into seven heavens and seven earths.

According to the third view expressed by Ikrimah (d.109A.H) and Ibn Abbas (d. 68A.H) in what was mentioned by Mahdi (d. 172A.H), the meaning of the heavens and earth were joined together implies that, the heaven initially did not send down rain and the earth did not produce vegetation, but when they were parted, the heaven rains and the earth produces vegetation.

With regard to the second phrase of the verse: *'And We have made from water every living thing'*, according to Qurtubi (1423A.H:258), there are three interpretations. The first is that everything was created from water as stated by Qatada (d. 117A.H). The second is that guarding the life of everything (living organisms) is with water. The third is that We (Allah) have provided water in the backbone of every living thing, as opined by Qatrab, Abu Hatim al-Busti in an authentic Musnad-Hadith from the Hadith of Abu Huraira (R.A) who said: He said, "Oh Messenger of Allah (S.A.W) when I see you, my heart become pleased and my eyes become delighted, inform me about everything (created)". He said, everything was created with water, including the inanimate things.

Gumi (1426A.H:1004) in his commentary of Q21:30 above states that, Abdullahi Ibn Abbas (d.68A.H) analysed the meaning of this verse by stating that the heavens and the earth were initially one, then Allah (SWT) separated them and He raised the heaven to where it is presently and he established the earth as it is now. The meaning of *'Before We clove them asunder'* is that Allah (SWT) made the heaven seven

layers and the earth a similar number. Cloving the heaven asunder could also mean that it rained not before and Allah (SWT) made it to rain, and cloving the earth asunder may mean that it did not vegetate before and Allah made it to vegetate. The last part of the verse *'And we made from water every living thing'* means that the water that comes down from the sky and the water that springs from the earth are used to create animals, plants, and other creatures as well.

The views expressed by commentators of the Qur'an mentioned above on Q21:30 clearly mean that, Allah (SWT) created the animate and inanimate things with water. The sources of this water come from the sky initially. We have other sources like springs, wells, rivers, seas and oceans. It should be understood that Allah (SWT) wishes to use water to create His creatures living in this planet (earth). Had it been He wishes not to create His creatures with anything, he could have done so, because nothing is impossible on His part. If He wishes, He can create something out of nothing. This is very possible on His part. This is the reason why the Qur'an states that:

﴿ إِنَّمَا قَوْلُنَا لِشَيْءٍ إِذَآ أَرَدْنَٰهُ أَن نَّقُولَ لَهُۥ كُن فَيَكُونُ ﴿٤٠﴾ ﴾

Indeed, our word to a thing when We intend it is but that We say to it "Be" and it is. (an-Nahl, Q16:40)

The above verse confirms that whatever Allah wishes to happen or to create, He only mentions "be" and it happens. This clearly means that the creation or work of Allah is not like that of His creatures. Allah (SWT) creates or makes things to happen within a second or the twinkling of an eye.

In modern time, there are some western scientists who profounded some theories regarding the issue of evolution. According to Britannica Students Library (2008:3), Darwin applied the theory of evolution to the world of nature. He stated that living organisms (such as plants and animals) rapidly reproduce offspring that the environment cannot cater for. Therefore, some that cannot withstand harsh environmental conditions such as competition for food, oxygen, shelter, etc may die before maturity. If they are many, they could not meet up with shelter and other things, they will die. That it is the environment that selects the organisms that will survive in that particular habitat.

As noted by Yahaya (1980:1), the theory of evolution came into view by the re-awakening of ancient materialistic philosophies. This philosophy pre-supposes that matter is absolute and infinite. Nothing is real according to this materialistic philosophy, with the exception of matter. The theory also denies creation and claimed that everything whether animate or inanimate appeared without any means of creation but by co-incidence and then acquired an order. It is important to note that, the theory of evolution is not a scientific argument but a dogmatic philosophy and a materialistic world view hiding behind the mask of science.

According to the observation made in Britannica Student Library (2008:4), religious leaders during the time of Darwin opposed the theory due to the obvious reason that it clashed with their teachings. The explanation made by Darwin that human beings originated from apes attracted the attention of many people. Newspapers publicized this issue with great scorn. No proofs were provided by Darwin on the idea of evolution and origin of species. Scientific community also

doubted what he postulated as regard to his theory of evolution.

Anis-ud-din (n.d:108) expresses that Islam rejects the theory of evolution because most of its supporters attributed the origin of life to chance accumulation of matter in a particular form. To him, chance, accident, laws of nature e.t.c cannot explain everything such as atom, man, and the universe. The evolutionists are of the view that, it is not necessary to believe in Allah as the Creator. This idea is against the teachings of the revealed religions. The Qur'an states:

﴿ وَلَئِن سَأَلْتَهُم مَّنْ خَلَقَ ٱلسَّمَٰوَٰتِ وَٱلْأَرْضَ وَسَخَّرَ ٱلشَّمْسَ وَٱلْقَمَرَ لَيَقُولُنَّ ٱللَّهُ ۖ فَأَنَّىٰ يُؤْفَكُونَ ﴿٦١﴾ وَلَئِن سَأَلْتَهُم مَّن نَّزَّلَ مِنَ ٱلسَّمَآءِ مَآءً فَأَحْيَا بِهِ ٱلْأَرْضَ مِنۢ بَعْدِ مَوْتِهَا لَيَقُولُنَّ ٱللَّهُ ۚ قُلِ ٱلْحَمْدُ لِلَّهِ ۚ بَلْ أَكْثَرُهُمْ لَا يَعْقِلُونَ ﴿٦٣﴾ ﴾

If you asked them, "Who created the heavens and the earth and subjected the heaven and the moon?". They would surely say "Allah". Then how are they deluded?
And if you ask them, "who sends down rain from the sky and gives life thereby to the earth after its lifelessness? They would surely say "Allah". Say "praise

to Allah", but most of them do not reason.

(al-Ankabut, Q29:61 and 63)

Allah (SWT) assured the Prophet (S.A.W) that if he asked the unbelievers who created the heavens, the earth, the moon and the sun and sends down water from the sky to revive the earth after it is dead, their reply would be "Allah". This implies therefore that the Only One who creates and provides sustenance to his servants is Almighty Allah. The changes experienced in the natural environment such as the blowing of the winds, the idea of rainfall, alternation of night and day, life and death are only in the hands of Almighty Allah. Nature has no power to do anything, except what Allah wills, because it is created by Allah (SWT).

The Qur'an in many verses explicitly mentions about the creation of the universe and how Almighty Allah evolved certain things in it according to stages. These are gradually carried out according to the plans and will of the Creator as shown in the following verse:

﴿ يُدَبِّرُ ٱلْأَمْرَ مِنَ ٱلسَّمَآءِ إِلَى ٱلْأَرْضِ ثُمَّ يَعْرُجُ إِلَيْهِ فِي يَوْمٍ كَانَ
مِقْدَارُهُۥٓ أَلْفَ سَنَةٍ مِّمَّا تَعُدُّونَ ۝٥ ﴾

He arranges (each) matter from the heavens to the earth, then it will ascent to him in a Day, the extent of which is a thousand years of those which you count.

(as-Sajdah, Q32:5)

Al-Mahalli *et al* (1432A.H:1190) highlight that, the meaning of the above verse is that Allah (SWT) arranges every affair from the heavens to the earth along the span of the life of the world. Then the decision of the entirety of the disposing and decreeing of affairs is referred to Him Alone in one day that is equal to one thousand years of our reckoning (the present world's time).

2.3.1 The Period of Evolution

Through the study of fossils, biologists and paleontologists have indicated that life on earth in the past was not the same as it is at the present time. There was continuous change of life on earth from simple in the early time, but with the passage of time, the life of plant and animals become more and more complex.

Anis-ud-deen (n.d:105) explains that, the biologists were not able to come up with the exact date life first appeared on earth. By estimation, however, life appeared first somewhere between 500 and 3000 million years back. In addition to this, it was not known whether life started at one place in one particular instant of time or it was created spontaneously at different places and time. Life came into existence on earth according to most scientists, rather than arriving full blown from outer space. The question to be asked is that, who initiated life? Muslims believe that anything that exists has beginning and end. It is only Allah that cannot be equated with any thing that exists, for He does not have beginning or end.

Almighty Allah is the One Who originated life or created the creatures that exist. The Qur'an says:

﴿ أَوَلَمْ يَرَوْا كَيْفَ يُبْدِئُ ٱللَّهُ ٱلْخَلْقَ ثُمَّ يُعِيدُهُۥٓ ۚ إِنَّ ذَٰلِكَ عَلَى ٱللَّهِ يَسِيرٌ ﴿١٩﴾ ﴾

Have they not considered how Allah begins creation and then repeats it? Indeed that for Allah is easy.

(al-Ankabut, Q29:19)

The meaning of the above verse is that, Allah (SWT) originated the creation and He can repeat them as well whenever they die and become disintegrated. He initiated the creation when the creatures were not in existence before. He also has the power to create things out of nothing or by using certain things. For instance, He created the heavens and earth out of nothing and He created Adam (the father of mankind) from sounding clay, angels from light, and jinns from flaming fire. Doing all these phenomenon of creations are easy to Almighty Allah.

The different creatures that were created in the past and in present time are all known to Allah, for He has perfect knowledge of everything. He states this in the Qur'an:

﴿ وَلَقَدْ عَلِمْنَا ٱلْمُسْتَقْدِمِينَ مِنكُمْ وَلَقَدْ عَلِمْنَا ٱلْمُسْتَـْٔخِرِينَ ﴿٢٤﴾ ﴾

And We have already known the preceding (generations) among you and We have already known the later (ones to come) (al-Hijr, Q15:24)

Ibn Kathir (2003:390) explains the meaning of the above verse (Q15:24) by relating it to the views upheld by Ibn Abbas, (d.68A.H). The latter said, the first generation were all those

who have passed away since the time of Adam. The present generations and those who will come afterward refer to those who are alive now, and who are yet to come, until the day of Resurrection. The same view was upheld by Ad-Dahhak (d.212 A.H), Ash'Sha'abi(d.103AH),Ikrimah (d.107A.H),Mujāhid (d.103A.H)Qatādah(d.117A.H)and others. Mustaqdimin (those who have passed away) and Musta'khirin (those who will come afterwards) according to another meaning given by Muhammad bn Ka'ab refers to those who are dead or have been killed and those yet to be created.

The evolutionary period of the earth and the heavenly bodies are divided by the Qur'an into six days. Out of the six days, two days which are called Yawmayn in Surah Fussilat cover the days before life began on earth. Wadud (1971:177) notes that, the evolution of the earth took place in two days. Almighty Allah states:

﴿ قُلْ أَئِنَّكُمْ لَتَكْفُرُونَ بِٱلَّذِى خَلَقَ ٱلْأَرْضَ فِى يَوْمَيْنِ وَتَجْعَلُونَ لَهُۥٓ أَندَادًا ۚ ذَٰلِكَ رَبُّ ٱلْعَٰلَمِينَ ﴿٩﴾ ﴾

Say: "Do you indeed disbelieve in He Who created the earth in two days and

attribute to Him equals? That is the Lord of the worlds".

(al-Fussilat, Q41:9)

The earth according to the above verse was created in two days. It is regarded as the foundation of the universe, hence, it was created after the heaven, which is the roof. According to Ibn Kathir (2003:517), the creation of the earth took place on Sunday and Monday. Its creation was followed by the creation of mountains, inanimate things, rocks, hills, sand, and everything in between in another two days.

In the succeeding verse of the same Surah Fussilat (Q41:10), it is indicated that Allah created all things on earth and gave them nourishment in four days. According to Ali (1983:1288), the commentators of Qur'an understood the "four days" mentioned in verse 10 to include the two days in verse 9, meaning that the earth was created in two days, what are contained in it were created in another two days, then Allah created the heavens in another two days as shown in the following verse:

﴿ فَقَضَىٰهُنَّ سَبۡعَ سَمَٰوَٰتٖ فِي يَوۡمَيۡنِ وَأَوۡحَىٰ فِي كُلِّ سَمَآءٍ أَمۡرَهَاۚ وَزَيَّنَّا ٱلسَّمَآءَ ٱلدُّنۡيَا بِمَصَٰبِيحَ وَحِفۡظٗاۚ ذَٰلِكَ تَقۡدِيرُ ٱلۡعَزِيزِ ٱلۡعَلِيمِ ﴿١٢﴾ ﴾

And He completed them as seven heavens within two days, and inspired (i.e made known) in each heaven its command. And We adorned the nearest heaven with lamps (i.e stars for beauty) and as protection. That is the determination of the Exalted in Might, the knowing.

(al-Fussilat, Q41:12)

On the other hand, the entire period since the beginning of the universe's creation is divided into six days as asserted by Ṭanṭāwi (1342.AH:6). He supported this assertion by quoting a verse in Surah Yunus, which states:

﴿ إِنَّ رَبَّكُمُ ٱللَّهُ ٱلَّذِي خَلَقَ ٱلسَّمَٰوَٰتِ وَٱلۡأَرۡضَ فِي سِتَّةِ أَيَّامٖ ثُمَّ ٱسۡتَوَىٰ عَلَى ٱلۡعَرۡشِۖ يُدَبِّرُ ٱلۡأَمۡرَۖ مَا مِن شَفِيعٍ إِلَّا مِنۢ بَعۡدِ إِذۡنِهِۦۚ ذَٰلِكُمُ ٱللَّهُ رَبُّكُمۡ فَٱعۡبُدُوهُۚ أَفَلَا تَذَكَّرُونَ ﴿٣﴾ ﴾

Indeed your Lord is Allah, Who created the heavens and the earth in six days and then established Himself above the Throne, arranging the matter (of His creation). There is no intercessor except after His permission. That is Allah, your Lord so worship Him. Then will you not remember? (Yunus, (Q10:3).

The earth and heavens were created by Allah in six days according to the above verse. The six days means that certain external forms of the universe were completed in six days by the command of Allah. Allah did not complete His creation in six days and rested. He is the Creator whose work, power, and will are beyond our comprehension. Another important thing to note is that, Allah does whatever He feels to do within the twinkling of an eye.

In his analysis of the above verse (Q10:3) Baghawi (1417A.H:120) maintains that, the meaning of days used in the verse refers to the time when the sun rises and then sets, but before that time (of creating the heavens and earths), there was no sun. In another version according to him, the days refers to the days of the hereafter, and every day (of the hereafter) is like one thousand years (in our calendar). In another different view, the six days mentioned refer to the days we use in this world. Along this line, Sa'id bn Jubayr (d.94A.H) pointed that, Allah the Most High and wise has the power to create the heavens and earth within the twinkling of

an eye or second, yet He created them in six days, so as to teach His creatures on the need for making things gradually.

The Prophet (S.A.W) explained an issue related to the throne and its creation in the following Hadith:

عن عمران بن حصين قال: إني عند النبي صلى الله عليه وسلم إذ جاءه قوم من بني تميم فقال: اقبلوا البشرى يا بني تميم، قالوا: بشرتنا فاعطنا، فدخل ناس من أهل اليمن فقال: اقبلوا البشرى يا أهل اليمن إذ لم يقبلها بنوا تميم، قالوا: قبلنا جئناك لنتفقه في الدين ونسألك عن أول هذا الأمر ما كان، فقال: كان الله ولم يكن شيء قبله، وكان عرشه على الماء، ثم خلق السماوات والأرض وكتب في الذكر كل شيء. (رواه البخاري).

Narrated Imran bn Hussain (R.A): while I was with the Prophet (S.A.W), some people from Bani Tamim came to him. The Prophet (SAW) said, "O Bani Tamim! Accept the glad tidings! They said, "You have given us the good news; now give us (something). (After while), some Yemenites entered, and he said to them, "O the people of Yemen! Accept the glad tidings, as Bani Tamim have refused it". They said, "we accept it, for we have come to you to learn the religion. So we ask you what the beginning of this universe was". The Prophet (S.A.W) said, "There was Allah (SWT) and nothing else before Him, and His Throne was over the water and He then created the heavens and the earth and wrote everything in the Book - - -.

(Bukhari, Vol. 4 Hadith 414).

According to the above Hadith, the Prophet (S.A.W) in response to the question raised to him by some Yemen people on the beginning of creation, stated that before anything was created, there was Almighty Allah. This clearly means that,

Allah (SWT) has no beginning, nor can there be an end to Him. Almighty Allah initiated His creation by starting with the universe, which was over the water. This was followed by the creation of the heavens and earths. All these as pointed in the Hadith were contained in the Book, meaning *Lauh al-Mahfuz* (The Preserved Tablet).

The Prophet (S.A.W) mentioned about the sequence of the beginning of creation in a Hadith reported by Abu Huraira (R.A) which states that:

> "خلق الله عز وجل التربة يوم السبت، وخلق فيها الجبال يوم الأحد، وخلق الشجر يوم الاثنين، وخلق المكروه يوم الثلاثاء، وخلق النور يوم الأربعاء، وبث فيها الدواب يوم الخميس، وخلق آدم عليه السلام بعد العصر يوم الجمعة في آخر الخلق وفي آخر الساعة من ساعات الجمعة فيما بين العصر إلى الليل".
> (رواه مسلم)
>
> *Allah, the Exalted and Glorious created the clay on Saturday, and He created the mountains on Sunday, and He created the trees on Monday, and He created the things entailing labour on Tuesday, and He created the light on Wednesday, and caused the animals to spread on Thursday, and He created Adam (A.S) after Asr on Friday; the last creation at the last hour of the hours of Friday, i.e between afternoon and night.*
>
> (Muslim, Vol. 8, Hadith 6707).

The Glorious Qur'an states that Almighty Allah created the earth in two days, the heavens in two days and the things between the heavens and earth in another two days, making a

total of six days. This is contained in the following verse of the Glorious Qur'an:

﴿ ٱلَّذِى خَلَقَ ٱلسَّمَٰوَٰتِ وَٱلْأَرْضَ وَمَا بَيْنَهُمَا فِى سِتَّةِ أَيَّامٍ ثُمَّ ٱسْتَوَىٰ عَلَى ٱلْعَرْشِ ٱلرَّحْمَٰنُ فَسْـَٔلْ بِهِۦ خَبِيرًا ﴿٥٩﴾ ﴾

He Who created the heavens and the earth and what is in between them in six days and then established Himself above the Throne the most Merciful, so ask about Him one well informed (i.e the Prophet S.A.W.). (al-Furqan, 25:59)

Ibn Kathir (2003:191) states that, Allah (SWT) by His might and power created the seven heavens with their vast height and width and the seven earths with their great depths and density in six days. Allah (SWT) runs all affairs and decrees according to truth, and He is the best of those who decide.

The earth was created first, then Allah made it to be come seven earths, just like how building usually starts with the lower floors first and then the top floors, then the heaven was created later and the earth became spread.

He added, that when Ibn Abbas (d.68A.H) was asked about the idea of spreading the earth after the creation of the

heaven, he responded that the earth was created before the heaven, it was spread out only after the heaven was created. This is the idea of several scholars of Tafsir of old and recent times.

The creation of seven heavens was made in such a way that they are arranged in ascending order; one following the other. As regard to the earth layer, they are arranged in descending order, one following the other.

According to Ibn Kathir (2003:608), the distance between the heaven and earth is the distance of five hundred years traveling and its thickness is like the distance of five hundred years. Between one earth and another also is a distance of five hundred years as mentioned for the heavens.

The Almighty Allah created the heavens to serve so many purposes, such as the following:

1. The source of rain water is the sky, which is part of the heaven. Sending rain to us is a blessing, for we cannot survive without it.
2. We get sunlight during the day time from the sky, which assists in the growth of plants.

3. The stars that were placed for us in the sky helps to guide the travelers when travelling by air, land and sea.
4. The moon is useful because we use its light to see many things especially in the night.

Allah (SWT) created the earth for our own use. Some of its benefits to us are as follows:

1. People plant different things during the rainy and dry seasons through the use of rainfall and irrigation on earth.
2. The food we consume is derived through farming on it.
3. The earth serves as a means of transportation in the olden and modern time. Roads are constructed on it, which paves the way in travelling from one place to another.
4. We derive water through the springs, rivers, wells, seas, and the like which are placed on earth. Fishing activities are not possible without rivers and seas that are placed on earth.

5. The houses we live are built on the earth, which is a blessing to us.
6. The dead ones among us are buried in the graves, which is part of the earth.
7. The mountains fixed in different places serves as stabilizers to the earth, otherwise we may experience shaking (of earth) from time to time.

2.3.2 *Human Evolution*

Man's evolution and development as explained by the contemporary human developmental theories of western science discarded the spiritual concern of his origin. Maitafsiri (1994:3) highlights that these theories speculated the origin of man as an organism formed out of animals. For instance, Darwin in his explanation on human evolution pointed that man originated from apes. According to the detailed analysis made in the field of anatomy, bio-chemistry, embryology, and physiology as pointed by Maitafsiri (1994:4) in Jega (1988), it has been established that human beings originated from animals because they have exact relationships within the

animal kingdom. In other words, the common characters of human beings resemble great apes, monkeys, pigs, bats, frogs and snakes, etc. This idea is totally rejected in Islam, because human geneology is not the same with animals' geneology. At no time did man share geneology with animals and the nature of man and animals can never be the same. The former is regarded in the sight of Allah as the best creature.

The second western scientific view on the origin of man as explained by Maitafsiri (1994:4) in Darwin (1964) and Leakey (1981) was that, man originated from no where but evolved out of expulsion of chemicals and electrical variables on earth.

Lemu (1980:12-13) elucidates that, at the time of the earth formation according to western conception of creation, chemicals and electrical forces changed to combine to form a sort of "primal soup" within which life came into existence by itself and other forms of life emerged spontaneously. She further added that according to western scientific ideas, these life forms grew progressively from simple one celled micro-organisms to become multicellular creatures. As comparative

late comers in the world, the mammals evolved from the reptiles. Within the mammals' kingdom, a creature resembling an ape, lived on the trees. At one stage, this ape left the trees and took to earth, by avoiding the use of hands to walk on. It stood upright on two legs and freed it hands thus for manipulations. Eventually, the freeing of the hands led to the experimentation of animals with tools which in turn resulted to the growth of its brain, so that in due course, he evolved into a human being. The above view according to Lemu (1980:13) goes with the idea that, man who originated from animals is what he is today as a result of the time passage and societal development.

According to the Qur'anic point of view, elucidated by Tantāwi (1342.AH) and Maitafsiri (1994:1-2), man originated from Adam (A.S) who was the spiritual father of men, moulded by Allah to human status by a Divine injunction of 'Be' and it became. This is attested to in Surah Ali-Imran which categorically states:

﴿ إِنَّ مَثَلَ عِيسَىٰ عِندَ ٱللَّهِ كَمَثَلِ ءَادَمَ ۖ خَلَقَهُۥ مِن تُرَابٍ ثُمَّ قَالَ لَهُۥ كُن فَيَكُونُ ﴿٥٩﴾ ﴾

Indeed, the example of Jesus to Allah is like that of Adam. He created him from dust; then He said to him, "Be" and he was. (Ali Imran, Q3:59)

Almighty Allah indicates in the above verse that, He created Adam (A.S) from dust (without a father and mother). He also created Isah (A.S) without a father. On the basis of creation, between Isah and Adam (A.S), the latter's creation is more superior to that of the former because he was created without a father and mother. Allah (S.W.T) pointed out in the verse that the human physical bodies were created from nothing more than dust.

Ahmad (1425A.H:59) maintains that, the reason behind the revelation of Q3:59 above is indicated in the following Hadith:

إن وفد نجران قالوا لرسول الله صلى الله عليه وسلم: مالك تشتم صاحبنا؟ قال: وما أقول؟ قالوا تقول: إنه عبد، قال: أجل إنه عبد الله ورسوله، وكلمته ألقاها إلى العذراء البتول، فغضبوا وقالوا: هل رأيت إنسانا فقط غيراب؟ فإن كنت صادقا فأرنا مثله، فأنزل الله عز وجل هذه الآية.

A delegation from Najran said to the Messenger of Allah (S.A.W): why do you curse our friend? He said what am I saying? They said, you are saying that

> *he is a slave. He said, yes, he is a slave to Allah, his Messenger and his word that he threw to the virgin Mary. They got enraged and said: have you ever seen a human being without a father? If you are veracious, show us his similitude. Allah the powerful then revealed the above verse* (Q3:59).

According to the above Hadith, the delegation of Najran was showing the superiority of Prophet Isah (A.S) as regard to his creation without a father, because of that, Allah (SWT) revealed Q3:59 to explain the nature of Adam's creation without father and mother.

We can deduce therefore that, there are four modes of human creation. The first man Adam (A.S) had no father and mother. He was created from the combination of seven different parts of the earth. Isah (A.S) had mother without father. Hauwa was created from Prophet Adam's ribs (meaning that she had father, but no mother). All the remaining human race (offsprings of Adam) were created with fathers and mothers.

The Qur'an indicates that human creation and development passes through three formative processes. In the

spiritual stage, man was originally created from dust (as has been said above). In the second stage of man's evolution, the spiritual phenomenon was changed to human reproduction process through the natural human biological relationship between male and female. Every human being was created through the contact of man and woman except Prophet Adam (A.S) Hauwa and Isah (A.S). The third stage deals with man's physical development after birth. These consist of his childhood, youthhood, adulthood and decay stages. The Qur'an explained all these in the 7th century C.E. For instance, Allah the Almighty says:

﴿ هُوَ ٱلَّذِى خَلَقَكُم مِّن تُرَابٍ ثُمَّ مِن نُّطْفَةٍ ثُمَّ مِنْ عَلَقَةٍ ثُمَّ يُخْرِجُكُمْ طِفْلًا ثُمَّ لِتَبْلُغُوٓا۟ أَشُدَّكُمْ ثُمَّ لِتَكُونُوا۟ شُيُوخًا ۚ وَمِنكُم مَّن يُتَوَفَّىٰ مِن قَبْلُ وَلِتَبْلُغُوٓا۟ أَجَلًا مُّسَمًّى وَلَعَلَّكُمْ تَعْقِلُونَ ﴿٦٧﴾ ﴾

It is He Who created you from dust, then from a sperm-drop, then from a clinging clot; then He brings you out as a child; then (He develops you) that you reach your (time of) maturity, then (further) that you become elders. And among you is he who is taken in eath before (that), so that you reach a specified term, and perhaps you will use reason.

(al-Ghâfir, Q40:67)

A summary of man's evolution is provided in the above verse. According to Wadud (1971:167), the life of man is initiated in the inorganic matter, then followed by the appearance of the reproductive unit and there follows the development of uterus in the organism and the development of foetus inside the uterus got initiated later. After the birth of man, he continued his physical growth from one stage to another until he reaches weaker stage in life when he becomes old.

2.4 Biological Aspects of Human Growth and Development

In his explanation on the biological aspects of human growth and development, Oladele (1998:14) asserts that, every human being's life begins at the time of conception of a new individual when the nucleus of the sperm fuses with the nucleus of the ovum (egg) in the fallopian tube (oviduct) but there is variation of date among mankind. The ovum that is fertilized is called zygote, which immediately begins a process of growth and development. The hereditary materials of life-chromosomes and deoxyribonucleic acid (DNA) molecules are contained in the reproductive cells. It is this DNA molecules of

the nucleus which directs all chemical reactions that goes on in the cell.

Ahmed (1996:89) expounds that, man passes through the pre-natal, and post-natal developmental stages in life. To him, pre-natal period is the main developmental changes where the embryo develops certain morphological characteristics. The first stage of development starts at fertilization and the embryonic development ends at stage 23, when the human shape begins to be recognizable, that is after the formation of bones and clothing the bones with muscular flesh. On day 57 after conception, the foetal period begins and ends when the foetus is outside the mother completely.

On the other hand, the post-natal period of development according to Moore (2003:3) refers to the period that occurs after birth. This period subsumes the childhood, the puberty, adolescence stage and adulthood stage. In a nutshell, the pre-natal and post-natal stages mentioned by Ahmed (1996:87) are clearly analysed here. The child's post-natal development is greatly influenced and shaped by the pre-natal development. The five sensory organs of hearing, seeing, smelling, touching

and tasting are related to the genes which determine the physical and biological growth of man. It is the genes which determine the height, weight, color, sex, and human race. The child's resemblance to either of his parents is shown in a Hadith where the Prophet (SAW) said:

> "دعيها وهل يكون الشبه إلا من قبل ذالك إذا علا ماؤها ماء الرجل أشبه الولد أخوا له وإذا علا ماء الرجل ماءها أشبه أعمامها" (رواه مسلم).
>
> *Leave her alone. In what way does the child resemble her, but for the fact that when the genes contributed by woman prevail upon those of man, the child resembles the maternal family, and when the genes of man prevail upon those of woman, the child resembles the paternal family*
>
> (Muslim, Vol. 1 Hadith 613).

It is clearly summarized in the above Hadith how parents' human physical and behaviour traits are transmitted to their children. The physical status and other behavioural traits are being transferred from parents to their children from one generation to the other. It is Allah that makes children's behaviour, height, weight, intelligence, or any other thing to become similar with their parents' own characters and nature of physical traits through the genes.

The Qur'an further draws man's attention to his nature of life when he is created from a stage that he cannot be of use to himself, to the stage of childhood, youthhood, a fully grown adult and a time when he declines (when he becomes weak). To demonstrate this, Allah states as follows:

﴿ يَٰٓأَيُّهَا ٱلنَّاسُ إِن كُنتُمْ فِي رَيْبٍ مِّنَ ٱلْبَعْثِ فَإِنَّا خَلَقْنَٰكُم مِّن تُرَابٍ
ثُمَّ مِن نُّطْفَةٍ ثُمَّ مِنْ عَلَقَةٍ ثُمَّ مِن مُّضْغَةٍ مُّخَلَّقَةٍ وَغَيْرِ مُخَلَّقَةٍ
لِّنُبَيِّنَ لَكُمْ ۚ وَنُقِرُّ فِي ٱلْأَرْحَامِ مَا نَشَآءُ إِلَىٰٓ أَجَلٍ مُّسَمًّى ثُمَّ نُخْرِجُكُمْ
طِفْلًا ثُمَّ لِتَبْلُغُوٓا۟ أَشُدَّكُمْ ۖ وَمِنكُم مَّن يُتَوَفَّىٰ وَمِنكُم
مَّن يُرَدُّ إِلَىٰٓ أَرْذَلِ ٱلْعُمُرِ لِكَيْلَا يَعْلَمَ مِنۢ بَعْدِ عِلْمٍ شَيْـًٔا ۚ وَتَرَى
ٱلْأَرْضَ هَامِدَةً فَإِذَآ أَنزَلْنَا عَلَيْهَا ٱلْمَآءَ ٱهْتَزَّتْ وَرَبَتْ وَأَنۢبَتَتْ مِن
كُلِّ زَوْجٍۭ بَهِيجٍ ۝ ﴾

O people, if you should be in doubt about Resurrection, then (consider that) indeed, We created you from dust, then from a sperm drop, then from a clinging clot, and then from a lump of flesh, formed and unformed-that We may show you. And We settle in the wombs whom We will for a specified term, then We bring you out as a child, and then (We develop you) that you may reach your (time of) maturity. And among you is he who is taken in (early) death, and among you is he who is returned to the most decrepit (old) age so that he knows, after (once having) knowledge, nothing. And you see the earth barren, but When We send down upon it

rain it quivers and swells and grows
(something) of every beautiful kind.
(al- Hajj, Q22:5)

Those who doubt about resurrection are being called in the above verse to consider the nature of their life and the nature around them. Their life according to Ali (1983:851) started from matter which is lifeless; then to seed, fertilized ovum, foetus, child, youth age and death. Their attention is also drawn to the fact that the author of all the wonderful stages in their life can also give them another life after the end of this life. In fact, this is very simple on His part. The stages of human physical growth from nothing until he completes his life cycle are also described accurately, beautifully, and comprehensively in such a way that the details are fully understood by biologists.

Ibn Kathir (2003:525) elucidates on the teachings of the above verse where he described the nature of mans' creation which starts from Nutfah (small drop of sperm) in the womb of the woman for forty days, then later changes into a clot of blood, then becomes a lump of flesh for the same forty days, without any form or shape. It then later starts to take form

and shape, then the head, arms, chest, stomach, and other bodily organs developed. A woman sometimes miscarries before the formation of the foetus and sometimes after it has been formed.

According to Ibn Taimiyyah (n.d:247-248), the nature of embryonic development was explained by the Prophet (SAW) the truthful and truly inspired, in a Hadith reported by Abi Abdurrahman Abdullahi Ibn Mas'ud (R.A) who said:

"إن أحدكم يجمع خلقه في بطن أمه أربعين يوما، ثم يكون علقة مثل ذالك، ثم يكون مضغة مثل ذلك، ثم يبعث الله ملكا فيؤمر بأربعة: برزقه، وأجله وشقي أو سعيد ثم ينفخ فيه الرووح..."
(رواه البخاري).

Each One of you is collected in the womb of his mother for forty days, and then turns into a clot for an equal period (of forty days), and turns into a piece of flesh for a similar period of forty days and then Allah (SWT) sends an angel and orders him to write four things; i.e his provision, his age and whether he will be of the wretched or the blessed (in the hereafter). Then the soul is breathed into him...
(Bukhari, Vol. 8, Hadith 593).

The above Hadith summarizes the period man stays in the womb of his mother, which covers three stages: the Nutfah or spermatic stage, the blood of clot stage and the lump of flesh stage. The three stages as indicated in the above Hadith

take a period of 40 days times 3 for spermatic, blood of clot and the lump of flesh stages.

The Hadith quoted above indicates how Almighty Allah creates man through reproductive process. Man's creation begins as a nutfah (small or minute quantity of water, i.e the sperm). This sperm stays in the womb for a period of forty days, after which Allah (SWT) changes it to clotted blood and it stays for another forty days and then He (Allah) changes it to a piece of meat that looks like a chewed substance.

According to Bauchi (2000), the Nutfah, 'Alaqah and Mudghah stages of embryonic creation when totalled together, as stated in the above Hadith cover 120 days. After completing the Mudghah stage, then the skeleton (bones) begin to form and is later clothed with flesh of meat, like when a roofing is done in a building and zinc are placed on it after arranging the timbers.

Qurṭubi (1432A.H:330) cited another Hadith which further explains the stages undergone by man before his mother gives birth to him. Another Hadith was reported by

Hudhayfah bn Usaid from the Messenger of Allah (S.A.W) who said:

> "إذا مر بالنطفة ثنتان وأربعون ليلة، بعث الله إليها ملكا فصورها، وخلق سمعها، وبصرها، وجلدها ولحمها، وعظامها، ثم قال يا رب أذكر أم أنثى؟ فيقضي ربك ما شاء، ويكتب الملك" (صحيح مسلم. كتاب القدر)
>
> *When forty two nights have passed over the conceptus, God sends an angel to it, who shapes it (into human form) and makes its hearing, sight, skin, muscles and bones. He then says, o 'Lord, is it male or female? And your Lord decides what He wishes and the Angel records it.*
>
> (Sahih Muslim, Vol. 4, Hadith 2645).

The Hadith above shows that it is after the passage of 42 nights that an angel is sent to shape the embryo and make its hearing, sight, skin, muscles and bones. This does not mean that the angel creates the sense organs and bones. He is only entrusted to pave way for their creation to make it smooth. Every act of creation is exclusively in the hands of Almighty Allah.

In relation to man's creation as mentioned in the above Hadith, some commentators of Qur'an such as Alúsi (n.d) used

it to explain some Qur'anic verses such as Q23:12-14 where Allah says:

﴿ وَلَقَدْ خَلَقْنَا ٱلْإِنسَٰنَ مِن سُلَٰلَةٍ مِّن طِينٍ ﴿١٢﴾ ثُمَّ جَعَلْنَٰهُ نُطْفَةً
فِى قَرَارٍ مَّكِينٍ ﴿١٣﴾ ثُمَّ خَلَقْنَا ٱلنُّطْفَةَ عَلَقَةً فَخَلَقْنَا ٱلْعَلَقَةَ
مُضْغَةً فَخَلَقْنَا ٱلْمُضْغَةَ عِظَٰمًا فَكَسَوْنَا ٱلْعِظَٰمَ لَحْمًا ثُمَّ
أَنشَأْنَٰهُ خَلْقًا ءَاخَرَ ۚ فَتَبَارَكَ ٱللَّهُ أَحْسَنُ ٱلْخَٰلِقِينَ ﴿١٤﴾ ﴾

And certainly did We create man from an extract clay. Then We placed him as a sperm-drop in a firm lodging (i.e the womb). Then We make the sperm-drop into a clinging clot, and We made the clot into a lump (of flesh), and We made (from) the lump bones and We covered the bones with flesh, then We developed him into another creation. So blessed is Allah, the best of creators.

(al-Muminun, Q23:12-14)

The meaning of Insan which appears in the above verse refers to gender (of creation) according to Alusi (n.d:12). It is from the word *'Ins'* which means man, human race, people, human kind, or human beings as pointed by Farah *et al* (2004:109). Alusi (n.d:12) and Ibn Manzur (1306C.E:338) defines "*sulalah*" as "what is extracted from something" or "gentle extraction from fluid".

Allah (SWT) mentions that, He created man out of an extract of clay, meaning water and dust. In the succeeding verse according to Alusi (n.d:13), the gender of man (meaning offsprings of Adam (A.S) are created from water or drop of nutfah extracted from their parents. This nutfah is derived from food substance consumed by man. It remains in the womb of the mother, which is called qarar al-makin i.e place of settlement. Allah (SWT) keeps the nutfah in the mother's womb according to Bauchi (2000) safely in such a way that if it is somebody other than Him who keeps it (the nutfah) may likely pour out, because of improper protection.

Allah (SWT) changes the nutfah to another stage of creation called 'Alaqah, meaning coagulated blood. The nature of this blood is thick, because if it is made to be thin, it may be a problem to the mother. Alusi further elaborates that, it is this coagulated blood that Allah (SWT) changes it to a flesh like chewed substance. He pointed that the initial nutfah is solidified a little bit when it becomes alaqah and the solidity increases when it changes to Mudghah, Allah (SWT) then creates the bones. Alúsi (n.d:14) maintains that Baidawi

(d.691A.H) pointed that, the nuṭfah, ʻAlaqah *and* Muḍghah are referring to one thing. In other words, the second stage (Alaqah) originates from the first stage. Likewise the third stage of creation (Muḍghah) is derived from the second stage. He also mentions that, the Nuṭfah and ʻAlaqah stages have some features that are common within them, i.e they are more of liquid. The Muḍghah and ʻIzam also have some characteristics of strengths and solidification. According to him, one can chew a piece of meat and some bones that are not quite strong.

Alúsi also commented on the meaning of *'And We clothed the bones with flesh'* by elucidating that Allah provides cover to the bones, in a similar manner to a person wearing clothes to cover his body. He stressed that the flesh used to cover the bones may be the remaining part of the Muḍghah (chewed like substance) earlier used in the previous stage or it may be another flesh entirely. He explains that, Allah (SWT) created different bones in human body located in the skull, fingers, toes, hands, legs, ribs and other places. In a human body says

Alūsi (n.d: 14), there are two hundred and forty eight bones, with different joints.

Allah (SWT) mentions that *'and then We brought it forth as another creation'* in the verse. This means that, He creates something that is different from the first creation (as explained in the stages above). This creation (man) is made to speak, hear and see Alusi (n.d:14).

The meaning of - - *'and We brought it forth as another creation'* refers to the Ruh (soul) that Allah (SWT) decreed its provision after the body has been created. The above is the view upheld by most Islamic scholars. Alūsi (n.d:15) explains that, Aristotle (384-322B.C) a philosopher also maintained the same idea that, the soul is breathed after the body is erected. Another meaning is that the *ruh* (soul) is breathed or clinged to the body. On the other hand it means the strength that is given to the unborn child.

The word "Thumma" used in the verse (Q23:14) indicates the interval of time between a particular stage and another stage. This means that, there is delay between the sequential stages of human creation. For instance, there is delay between

clothing the bones with flesh and breathing the spirit into the foetus. It also shows that, the nature of sequentiality is made in such a way that one stage is more superior than the other, but they continue progressively. The conjunction *"fa"* is used to indicate that the event follows immediately upon one another. After the formation of bones, for instance, it is immediately followed by clothing it with flesh. (Zindani *et al*, 2000:168).

Maitafsiri (1994:7-9) analysed the nature of human growth and development that entails the following stages in human life:

1. **The inorganic matter stage**: This is the stage in which Almighty Allah used chemical substance derived from non-living organism to create. For example, the first man Adam (A.S) was created from clay. This stage clearly indicates the spiritual stage of human creation.
2. **The organic matter stage**: In this stage, substance derived from living organism is used to form something. The clay used originally to create man is reformed (i.e moist clay to protoplasm).

3. **Sperm Drop from the father**: The biological process of human evolution starts here. The drop of water man emits is used as a biological substance for reproduction.
4. **Fertilized ovum in the womb of the mother**: During this stage, the male nucleus combines with female ovum for human reproduction.
5. **Clot of congealed blood stage**: Here, the mixture of male and female nucleus changes into a leech.
6. **The foetus stage**: The leech is changed to a lump of flesh where the shape of human being starts.
7. **Human structure stage**: Almighty Allah in this stage begins to make bones which are clothed with flesh out of the lump of flesh.
8. **The stage of childhood**: This starts after birth. It varies between the two sexes and depends on the normality and abnormality of the child born. This stage comes to an end at about 13 and 14 years of age among the boys and girls.

9. **Youthhood stage**: It starts as soon as maturity is attained and ends around 39 years. Human life is realistically involved in this stage.

10 **Adulthood stage:** This starts from 40-60 years**.** It is the stage in which all the senses of man are developed. Man uses his faculty of reasoning to distinguish between good and bad, right and wrong. Efforts are made by man to attain the highest position in the life to come.

11. **Decay stage**: In this stage, man becomes weak and really needs assistance. Some of the senses of man are lost. This is the reason why the behaviour of some people at this stage looks very childish.

This stage likely start during the advanced period of adulthood, probably after 60 years of age, but if varies from one individual to the other. It should be noted that it is not all the people that behave like children in this stage of life. This depends on the individuals. Muslims whose nature of life right from their childhood up to the attainment of adulthood has been spent according to the dictates of Qur'an and Sunnah,

will never be confused in their advanced adulthood stage. The Qur'an mentions that:

﴿ٱللَّهُ ٱلَّذِى خَلَقَكُم مِّن ضَعْفٍ ثُمَّ جَعَلَ مِنۢ بَعْدِ ضَعْفٍ قُوَّةً ثُمَّ جَعَلَ مِنۢ بَعْدِ قُوَّةٍ ضَعْفًا وَشَيْبَةً ۚ يَخْلُقُ مَا يَشَآءُ ۖ وَهُوَ ٱلْعَلِيمُ ٱلْقَدِيرُ ﴿٥٤﴾﴾

Allah is the One Who created you from weakness, then made after weakness strength, then made after strength weakness and white hair. He creates what He wills, and He is the Knowing, the Competent.

(ar-Rum, Q30:54).

Creating man from weakness as mentioned in the above verse refers to the period when man cannot be of use to himself and others. Man is given strength especially from the period of youthhood up to the early period of adulthood. During the advanced adulthood stage in life, most people are weak. They definitely need assistance from other people.

The stages involved in man's creation as explained above indicate that the inorganic and the organic matter stage are the spiritual processes of man's creation. The 3rd -7th stage

subsume the biological aspect of man's creation and the 8th-11th stages involve the physical development of man.

In his attempt to explain the stages of man's developmental period of life, Ahmed (1996:89) noted that, the modern psychologists have classified the developmental stages viz:

(i) The period of neonate and infancy stages (0-2 years)

(ii) Early childhood period which cover (2-6 years)

(iii) Middle or late childhood stage which starts from (6-12 years)

(iv) Adolescent period which starts from 12 years to the age of maturity, which is likely to be 18 years.

(v) Adulthood stage (which starts from the age of maturity up to the end of one's life.

The above developmental stages in life correspond with what has been explained before in Qur'an 22:5 which summarizes the life of an individual that cover the biological and physical developmental stages. It has to be noted that, the psychologists lay emphasis on the physical growth of a person as shown in the five stages enumerated above. But they failed

to say anything on the spiritual origin of man that is very much important in religious literature, particularly the Qur'an.

The Glorious Qur'an in chapters 22:5 and 23:12-14, indicate that, man was created from clay. In chapters 36:77-79, 53:45-46, 76:2, 80:17, 86:5-6 and other verses, the Qur'an states that, man originated from spermatic fluid. In chapter 24:45, Almighty Allah categorically states that, every animal was created from water. 'Animal' in this regard is used in general term to encompass all Living things. Man is included among the categories of animals created from water. How does one therefore reconcile between the creation of man from clay, sperm, and water?

The creation of man from clay refers to Adam's initial creation. It is interesting to state that, when clay is mentioned, it means that water and dust are mixed together. Adam, the first man created was made of clay, which is the spiritual process of creating mankind.

Scientists also discovered that the human body consist of some elements which are the same with elements found in the dust. Through researches and investigations, they have

discovered that one kind of clay contains antibiotics which are able to kill the most obstinate kinds of germs. This is the reason why they are thinking to use dust to sterilize hospitals. (www.Kahee17.com).

The creation of man from clay, sperm, and water is not a contradiction. The only issue is that sometimes the Qur'an stresses these elements separately and sometimes combines them. Scientists made analytical studies of clay and the human body. This was after the developments in biology and chemistry as explained by **www.guranmiracles.com/articles.asp?id=48.** The result of the studies revealed that, the constituent of clay and human body fit each other exactly. These constituents include calcium, carbon, chlorine, hydrogen, iodine, iron, lead, magnesium, manganese, nitrogen, phosphorus, sulphur, and zinc.

As for the second issue of creating man from spermatic fluid, it means that the process of spiritual phenomenon of creation was changed to biological process, where sexual partners (males and females) mate to produce offsprings. Every man came into existence through this way, with the

exception of Prophet Adam (A.S) the father of mankind, created without father and mother and Prophet Isah (A.S) who had a mother, but no father and Hauwa had father without mother. This therefore shows that, legitimate and illegitimate children only come to existence when mating takes place.

2.4.1 The Science of Genetics and the Qur'an

Genetics as defined by Vines and Rees(1968:751) refers to, the biological science which seems to account for the resemblances and differences that are exhibited among organisms directly related by descent.

On the other hand, gene is defined as the basic unit of heredity. All the characteristics which are inherited from the parents are termed as heredity. In its explanation on genes, Microsoft Encarta (2007:1) highlights that, they are a kind of code among the animals and plants. The genes of a human being determine the colour of his eyes. In fact, the code in one's genes tells everything about a person. The gene of a tree tells what shape its leaves will be etc. Genes are lined up on strands called chromosomes in cells. Every living being is

made up of cell nucleus. The genes are not seen, but are known by their functions.

Osareren (1996:8) explains that, the cell nucleus of the egg and sperm contain chromosomes and basic units of heredity i.e the genes are found within the chromosomes, that under normal circumstances each male and female has 23 chromosomes. According to Medinnus (1969:49), due to the division of cell, any single sperm or ovum contains half of the total number of the chromosomes. In the zygote (being the fertilized egg), the chromosomes of sperm and ovum combine to give the fertilized egg 23 pairs of chromosomes, which restore the normal complement of 46, with half inherited from each parent. Many genes are found within the chromosomes.

Osareren (1996:7) points that, the male has XY chromosomes and the female has XX chromosomes. The sex of the child depends on the chromosomes released by the male to fertilize that of the female. The birth of a baby boy depends on the Y chromosome released by the father. For this reason, if an X chromosome is released by a man and it meets any of the woman's XX chromosomes, a baby girl will be delivered. She

was also of the opinion that, it is only a man that determines the sex of their child. That is because it is the X or Y chromosome the man releases which fertilizes the ripened X or X chromosome of the woman. She upholds that on no account should a woman be blamed as having female children. She additionally states that the sex of a baby is purely a matter of chance that occur involuntarily during conception.

The idea expressed above by Osareren (1996:7) that it is the father who determines the sex of their child and that the sex of the baby is purely a matter of chance are not accepted in Islamic perspective. The father only has sexual relations with his wife, but does not know the type of chromosome he releases. Releasing X or Y chromosome has already been predetermined and planned by Almighty Allah. This is evidently found in the following verse, where He states:

﴿ وَأَنَّهُۥ خَلَقَ ٱلزَّوْجَيْنِ ٱلذَّكَرَ وَٱلْأُنثَىٰ ﴿٤٥﴾ مِن نُّطْفَةٍ إِذَا تُمْنَىٰ ﴿٤٦﴾ ﴾

And that He creates the two mates the male and female. From a sperm-drop when it is emitted.

(an Najm, Q53:45-46).

The determination of the sex of embryo happens during the second to the last stage of the nuṭfah, otherwise called the nuṭfah amshāj (drop of mingled fluid) stage. The meaning of the above verse is that Allah creates pairs, that is genders (of male and female) from nuṭfah drops of semen.

Moreover, in modern time, there are some people who blame mothers for giving birth to girls instead of boys. The saying that it is the mother who decides on the sex of the child is a baseless idea. In addition, the idea upheld by Osareren (1996) above needs correction from Islamic view point. This correction is that, it is the Almighty Allah that determines the sex of the child through the sperm emitted by the father and not that the father determines their child sex as shown in a Hadith:

> "إذا مر بالنطفة ثنتان وأربعون ليلة، بعث الله إليها ملكا فصورها، وخلق سمعها، وبصرها، وجلدها ولحمها، وعظامها، ثم قال يا رب أذكر أم أنثى؟ فيقضي ربك ما شاء، ويكتب الملك" (صحيح مسلم. كتاب القدر)
>
> *When 42 nights pass after the nutfah settles in the womb, Allah sends an angel to shape it and creates its hearing, its vision, its skin, its flesh and bones and then the angel says: O Allah is he a boy or a girl? And Allah dictates what He wants.*
>
> (Muslim, Vol. 4, Hadith, 2645)

The Prophet (S.A.W) explained to his Companions (R.A) that, Allah creates people through the process of reproduction, and at birth, some children inherit so many things from their parents, such as disposition, intelligence, height, weight, feeling, health problem, and the like. This originally happens during the Taqdir (genetic programming) of the nuṭfah which occurs at the early stages of development not before that time. To substantiate this fact, Zindani *et al* (2000:41) quote a verse which says:

﴿ مِن نُّطْفَةٍ خَلَقَهُۥ فَقَدَّرَهُۥ ﴿١٩﴾ ﴾

From a sperm-drop He created
him and destined for him.
(Abasa, Q80:19).

Allah created man according to the above verse from nuṭfah and then programmed his future development. Programming or moulding man happens after fertilization. Ibn Abbas (d.68A.H), one of the best Qur'anic commentators among the (Companions) expressed that, moulding man as shown in the above verse means planning his eyes, legs, hands, other bodily organs, height, disposition and countenance. (Al-Qurṭubi, n.d:18).

Children inherit some characteristics from their parents through the gene mechanisms that could result in both recessive and dominant inheritance. A typical example of recessive inheritance could be seen in the following Hadith:

> أن أبي هريرة: أن رجلا أتى النبي صلى الله عليه وسلم، فقال: يا رسول الله ولد لي غلام أسود. فقال: هل لك من إبل؟ قال: نعم. قال: ما ألوانها؟ قال: حمر. قال: هل فيها من أورق؟ قال: نعم. قال: فأنى ذالك؟ قال: لعل نزعه عرق. قال: لعل ابنك هذا نزعه عرق. (رواه البخاري: كتاب الطلق).
>
> *A man came to the Prophet (S.A.W) and said: O Allah's Prophet, a black child has been born for me. The Prophet (S.A.W) asked: Do you have any camel? The man said, yes. The Prophet (S.A.W) asked, what colour are they? The man replied, red. Is there a grey one among them? The man replied, yes. Whence come that. He said, may be its (color) was pulled out by a hidden trait of heredity. The Prophet (S.A.W) said, may be your son's (color) was also pulled out by a trait of heredity.*
>
> (Bukhari, Vol. 7, Hadith, 225)

The above Hadith clearly indicates that, the laws of heredity are the same between men and animals. Another issue pointed in the Hadith is that at times characteristics that become hidden (recessive) for several generations may appear at another time in the future (Zindani, 2000:59). This

is compatible with the present knowledge regarding the laws of heredity.

2.5 The Qur'an and Human Sensory Organs

Allah has blessed His servants with numerous things in life and in their creation. Man, for instance, was nothing and does not know anything when he was initially created. Ibn Kathir (2003:95) and Odunfa (1983:90) stressed that, man is given the faculty of hearing in order to recognize voice, sight to see visible things and heart to receive and pump blood to the body. The heart is created for man in order to distinguish between right and wrong actions or good and bad things. The development of the senses and their abilities takes place gradually in man. The more a person grows, the more he hears, sees, and reasons until he reaches his peak. All the faculties of hearing ,seeing, tasting, touching etc are created in man to enable him know things, draw lessons from them, and worship the Creator (Allah) properly. The Qur'an states:

﴿ قُلْ هُوَ ٱلَّذِىٓ أَنشَأَكُمْ وَجَعَلَ لَكُمُ ٱلسَّمْعَ وَٱلْأَبْصَٰرَ وَٱلْأَفْـِٔدَةَ ۖ قَلِيلًا
مَّا تَشْكُرُونَ ﴿٢٣﴾ ﴾

Say, "It is He who has produced you and made for you hearing and vision and hearts (i.e intellect); little are you grateful".
(al-Mulk, Q67:23).

Ibn kathir (2003:95) comments on the above verse (Q67:23) by pointing out that, Almighty Allah initiates the creation of man when he (man) was not even a thing worth mentioning. Then Allah (SWT) provides him with the faculties of hearing, seeing, and heart (which means intellects and powers of reasoning). In the last part of the verse, Allah (SWT) indicates that man uses the abilities that Allah has blessed him with in little capacity to obey Him by acting according to His commandments and avoiding His prohibitions.

The nature of man's creation and growth are mentioned by Almighty Allah in the above verse. He is the only one Who created man and causes him to grow-stage by stage until man reaches old age. It is also pin-pointed that man gives little thanks to Allah inspite of his being blessed with the faculties which are meant to be used to properly worship the Guardian Lord.

2.5.1 The Sense of Hearing and Sight:

It has been stated above that Allah has endowed the faculty of hearing in man so as to enable him hear sounds and recognize voices. This is the reason why each person has two ears, one on each side of his/her head. Man hears sound waves according to al-Qazwini (672 A.H:245) which travel through air, water and solid objects. Allah provides three parts of the ear (the outer, middle and inner) that enable man hear things. Some people gradually lose their hearing when they get older. Almighty Allah through His wisdom enables a person to perceive whatever he hears. The way he hears the sound of machine, is not the same with the way he hears the sound of car, earoplane, and the like. The way he hears the voice of small children when crying is not the same as that of the adult. The voice of a girl is not the same as that of a woman. Man is also able to distinguish whatever sounds animals make, such as goat, donkey, cock, dog, hen, etc. The sounds of their cries are not the same.

According to Hamed (n.d:6), the ear starts developing at the beginning of the third week and completes function by the

twentieth week of conception. According to the recognition made by people, the foetus respond when its mother's abdomen is examined by ultrasound, to the extent that it appears as if it is dancing. The sound produced by the mother's intestines and her voice could also be heard by the foetus (www.aoryfromahonestsoul. com/main.htm). For this reason, deafness is easily identified while the baby is still in its mother's womb. Hamed (n.d) further elaborates that through research, it has been established that the foetus hears the noise from outside, despite being in the mother's womb, with all sorts of darknesses. Zindani (2000:6) maintains that the foetus hears sound after the 24th week while in the mother's womb. On the sense of hearing, the Qur'an says:

﴿ وَهُوَ ٱلَّذِىٓ أَنشَأَ لَكُمُ ٱلسَّمْعَ وَٱلْأَبْصَٰرَ وَٱلْأَفْـِٔدَةَ ۚ قَلِيلًا مَّا تَشْكُرُونَ ﴿٧٨﴾ ﴾

And it is He Who produced for you hearing and vision and hearts (i.e intellect); little are you grateful.

(al-Muminun, Q23:78).

The sense of hearing which is mentioned in the above verse comes first before that of sight, feeling etc. The Qur'anic description as depicted by Naik (2001:63) matches with what

the modern embryologists discovered. This shows that, embryology is compatible with the Qur'an. In a developing human embryo, according to Naik (2001:62), the first sense to develop is hearing. He confirms that, it is after the 24th week that the foetus begins to hear sound and the sense of sight then develops. According to http://www.acryfromanhonestsoul.com/main.htm (2008:6) in: Moore (2003), the sense of hearing functions much earlier than the sense of sight, hence it is mentioned first in the verse like Q23:78, (quoted above) and the following verse as well:

﴿ ثُمَّ سَوَّىٰهُ وَنَفَخَ فِيهِ مِن رُّوحِهِۦ وَجَعَلَ لَكُمُ ٱلسَّمْعَ وَٱلْأَبْصَٰرَ وَٱلْأَفْـِٔدَةَ ۚ قَلِيلًا مَّا تَشْكُرُونَ ﴿٩﴾ ﴾

Then He proportioned him and breathed into him from his (created) soul and made for you hearing and vision and hearts (i.e intellect), little are you grateful.

(as-Sajdah, Q32:9).

Al-Mahalli et al (1431A.H:1191) comments on the meaning of Q32:9 above by pointing that Allah mentions "*And He fashioned him*", meaning Adam (A.S), the first man created, in due proportion, and breathed into him the soul that is created for him and his children later. Allah (SWT)

also provides senses to man after his being an inanimate thing before, changed to animate later. These include the sense of hearing, meaning ears and the sense of sight meaning eyes, and then he gave man the heart.

In line with the commentaries given by scholars above, Almighty Allah provides man with those sense organs for some purposes. Hearing is very important, because without it, communication between people will be very difficult. On the other hand, a person who does not have eyes, lacks the sense of sight, which is an aspect of blessing to him. A blind man for instance, finds it very difficult to move without the assistance of another person who sees. These clearly indicates that, the sense organs are very valuable to us, for anybody who loses any of these, cannot obtain such from the hospital, because they are not sold, neither can they be provided by medical doctors or any human being.

In order to show the supremacy of the sense of hearing over other sensory organs, Shebrawy (n.d:7) in his lecture "*Scientific Enlightenment in some Qur'anic verses*" says: "The auditory that evoked response is a more reliable test to prove a

person's death". This means that the sense of hearing is the last sense to cease, as explained by (www.acryfromanhonest soul.com/main.htm).

The second sense organ Allah (SWT) endowed man with is the sense of sight, as a blessing, to enable him see things clearly. The functions of the eyes to us are very numerous. For instance, a person reads the Glorious Qur'an and other books, watches Television, sees his friends, family, objects, and everything with it. The eyes work with the brain to create a picture of the world. The eyes begin to develop during the 4th week.

According to http://www.acryfromanhonestsoul.com/main.htm (2008:6) in: Moore (2003), during the stage ten of development (around 22 days) the first evidence of the development of the eyes is noticeable. He adds that, 'the eye lids meet and adhere by about the tenth week, and remain adherent until about the twenty-sixth week'. By the 28th week according to Naik (2001:62), the retina becomes sensitive to light. Moore *et al* (2003:6) adds that:

> Infants do not see well for the first few weeks. They have a vacant stare mainly because of incomplete development of macula lutea and forvea centralis, the area of the retina responsible for visual activity. These structures are not completely developed until about a month after birth.

2.6 Qur'anic Point of View on the Nature of Human Soul

There are various views upheld by scholars such as Ibn Qayyim (d.751A.H) as affirmed by Ibn Abdul'Izz al-Hanafi in his commentary on al-Aqidat-at-Tahawiyyah. According to al-Kanadi (n.d) in Sunnahonline.com>Library>Publication of the Soul-cached, the above mentioned scholars upheld the view that man consists of a spirit and a body together. The spirit is an entity which differs from the physical, tangible body. It is alive and moving and penetrates the limbs, circulating through them as water circulates through the petals of a rose, as fire circulates through the burning embers of a coal and as oil circulates throughout the olive. The Qur'an mentions about certain circumstances of the human soul, such as in the following verse:

﴿ ٱللَّهُ يَتَوَفَّى ٱلْأَنفُسَ حِينَ مَوْتِهَا وَٱلَّتِي لَمْ تَمُتْ فِي مَنَامِهَا ۖ فَيُمْسِكُ ٱلَّتِي قَضَىٰ عَلَيْهَا ٱلْمَوْتَ وَيُرْسِلُ ٱلْأُخْرَىٰ إِلَىٰ أَجَلٍ مُّسَمًّى ۚ إِنَّ فِي ذَٰلِكَ لَآيَاتٍ لِّقَوْمٍ يَتَفَكَّرُونَ ﴿٤٢﴾ ﴾

Allah takes the souls at the time of their death, and those that do not die (He takes) during their sleep. Then He keeps those for which He has decreed death and releases the others for a specified term. Indeed, in that is a sign for a people who give thought. (az-Zumar, Q39:42).

It can be deduced from the above verse that Almighty Allah takes soul in two different times: at the point of death and during sleep. He separates the soul from the body when one sleeps. Alkanadi (n.d"2) maintains that if Allah destined death for a person when asleep, the separation of the soul from him becomes permanent and the body no longer functions. In case of a person for whom death has not been destined at that time, the soul taken during sleep is returned to its respective body when that individual is awake. If Allah has destined death upon any person, not necessarily during

sleep, his or her soul would be taken at any other time by sending an angel to do so, by the permission of Allah (SWT).

The Glorious Qur'an mentions about the origin of mankind in the following verse:

﴿ يَٰٓأَيُّهَا ٱلنَّاسُ ٱتَّقُوا۟ رَبَّكُمُ ٱلَّذِى خَلَقَكُم مِّن نَّفْسٍ وَٰحِدَةٍ وَخَلَقَ مِنْهَا
زَوْجَهَا وَبَثَّ مِنْهُمَا رِجَالًا كَثِيرًا وَنِسَآءً ۚ وَٱتَّقُوا۟ ٱللَّهَ ٱلَّذِى تَسَآءَلُونَ بِهِۦ
وَٱلْأَرْحَامَ ۚ إِنَّ ٱللَّهَ كَانَ عَلَيْكُمْ رَقِيبًا ﴿١﴾ ﴾

O mankind, fear your Lord, who created you from one soul and created from it its mate and dispersed from both of them many men and women. And fear Allah, through whom you ask one another, and the wombs. Indeed Allah is ever, over you an observer.
(an-Nisa'i, Q4:1)

Allah (SWT) indicates in the above verse that, He created mankind from a single person, i.e Prophet Adam (A.S). It was after the creation of Adam (A.S) that Hawwa (A.S) was created from his left rib as stated by Mahalli et al (1431A.H:250). After the creation of Adam (A.S) from sounding clay, then the angels prostrated to him. In this connection, the Qur'an states:

﴿ فَإِذَا سَوَّيْتُهُۥ وَنَفَخْتُ فِيهِ مِن رُّوحِى فَقَعُوا۟ لَهُۥ سَٰجِدِينَ ﴿٢٩﴾ ﴾

So when I have proportioned him and breathed into him of my (created) soul, then fall down to him in prostration.
(Sad, Q38:72)

The above verse indicates that Allah breathed his soul to Adam (A.S) as a way of honouring him according to Mahalli *et al* (1431 A.H:1316). It should be understood that at the initial stage, Allah (SWT) created Adam from clay and later breathed soul into him, which made him to be alive. After the creation of every person, before he/she starts movement or turning in the mother's womb, the Ruh (spirit) must have been breathed into it.

It implies from the above verses that, since human beings are the grand children of Prophet Adam (A.S), it means they must have inherited certain things Allah (SWT) created for him, such as the soul.

Knowledge of the nature of human soul is something that is exclusively in the hands of Almighty Allah. This is the reason why the Prophet (SAW) when questioned about it by the Jews of Madinah, kept quiet; then Allah (SWT) revealed the following verse:

﴿ وَيَسْـَٔلُونَكَ عَنِ ٱلرُّوحِ ۖ قُلِ ٱلرُّوحُ مِنْ أَمْرِ رَبِّى وَمَآ أُوتِيتُم مِّنَ ٱلْعِلْمِ إِلَّا قَلِيلًا ﴿٨٥﴾ ﴾

And they ask you (O Muhammad) about the soul. Say, "The soul is of the affair (i.e, concern) of my Lord. And you (i.e mankind) have not been given a knowledge except a little.

(al-Isra, Q17:85)

In his commentary on the above verse, Qurṭubi (1423A.H:651) cited a Hadith reported by Abdullahi Ibn Mas'ud (d. 32A.H) which was recorded by Imam Bukhari (d.256A.H), Muslim (d.261A.H) and Tirmidhi (d.279A.H), which states:

"بينما أنا مع النبي صلى الله عليه وسلم في حرث وهو يتكئ على عسيب إذ مر اليهود فقال بعضهم لبعض: سلوه عن الروح، فقال: ما رأيكم إليه، وقال بعضهم لا يستقبلكم بشيء تكرهونه، فقالوا سلوه، فسألوه عن الروح، فأمسك النبي صلى الله عليه وسلم فلم يرد عليهم شيئا فعلمت أنه يوحى إليه. فقمت مقامي، فلما نزل الوحي قال: ويسألونك عن الروح قل الروح من أمر ربي وما أوتيتم من العلم إلا قليلا".

While I was walking with the Prophet (S.A.W) in a farm, and he was resting on a palm-leaf stalk, some Jews passed by. Some of them said to the others, ask him about Ruh. Some of them said: what urges you to ask him about that.? Others said, do not ask him lest he gives you a reply which you did not like. But they asked him about the Ruh. The Prophet (S.A.W) kept quiet and did not give them an answer, and I knew he was receiving revelation. So I stayed where I

was when the revelation was completed, the Prophet (S.A.W) said the verse as quoted above (Q 17:85)

(Bukhari, vol. 6, Hadith 245)

The above Hadith clearly shows that, the reason why Qur'an (17:85) was revealed to the Prophet (S.A.W) was due to the question raised by the Jews. They were given the reply that the idea of Ruh is something beyond man's knowledge. No human being can say something on the nature of soul. What can be said about it is that, when Allah (SWT) breathes it, human life begins and when it departs the body, then that shows the end of one's life.

Qurṭubi (1423 A.H:331) highlights that there is no divergent opinion among scholars on the time for the acquisition of the soul. He pointed that the Ruh is breathed into human being after four months of conception, precisely within four months and ten days.

In summary, it is after the foetus passes through the stages of creation from nutfah (minute quantity of sperm stage) up to the nash'ah (foetal growth stage) that he acquires

soul and Almighty Allah instructs the angel to write about his/her destiny.

In his explanation on Ruh and Nafs, Ibn Kathir (2003:78) explains that, Suhail (R.A) mentioned the scholars' dispute on whether Ruh and Nafs are the same or they differ. He maintained that Ruh is light and soft like the flowing of the air through the body like water, through a tree's veins.

One thing that we should take note of is that, the Ruh and Nafs are connected to each other. Ruh is not regarded as Nafs except when it joins the body and is affected by it. The essence and origin of man is called the Ruh and the Nafs consists of the Ruh and its connection to one's body.

In a Hadith reported by Abdullahi Ibn Mas'ud (R.A) who said: "The Messenger of Allah (S.A.W.) the truthful and trusted told us that:

> "إن أحدكم يجمع خلقه في بطن أمه أربعين يوما، ثم يكون علقة مثل ذالك، ثم يكون مضغة مثل ذلك، ثم يبعث الله ملكا فيؤمر بأربعة: برزقه، وأجله وشقي أو سعيد ثم ينفخ فيه الرووح..." (رواه البخاري).
>
> *The creation of everyone of you (starts with the process of collecting the material for his body) within forty days in the womb of his mother. Then he becomes a clot of thick blood for similar*

> *period (40 days) and then he becomes like a piece of flesh for a similar period. Then an angel is sent to him (by Allah) and the angel is allowed (ordered) to write (four things for the new creature): his livelihood, his date of death, his deeds and wether he will be a wretched one or a blessed one (in the hereafter) and then the soul is breathed into him - -*
>
> (Bukhari, Vol. 8, Hadith 593)

Man's embryonic stages of development consisting of the (Nutfah (minute quantity of sperm drop), 'Alaqah (leech like stage) and Mudghah (chewed like substance) are summarized in the above Hadith. Man's creation does not come to completion until after an Angel is sent to breathe the soul unto him after 4 months of conception as asserted by Qurṭubi (1423A.H:331). The foetus acquires soul according to Moore *et al* (1990:45) as a result of its being capable of moving voluntarily from his own desire as opposed to moving reflexively. The foetus, for instance, during the 10th week of development exhibits spontaneous movement and moves in response to stimuli. This movement can serve as an evidence that it has acquired a soul. This happens during the nash'ah

(foetal stage) of development that starts in the ninth week and ends in the 38th week.

The views of Islamic jurists as indicated by al-Qardāwi (2005:196) is that, once the foetus has acquired soul, to abort it is tantamount to committing blasphemous act. However, if the life of the mother is under risk, doing so is better, because saving the life of a single individual is very crucial when compared to saving the life of all humanity.

On the other hand, Haque (2004:357-359) citing al-Ghazali (d. 1111 C.E.) in line with the Qur'an, divided Nafs into three. The first one is called Nafs al-ammārah which instigates man to commit evil and freely indulge in gratifying passions. On this, the Qur'an states in Surah Yusuf:

﴿ وَمَآ أُبَرِّئُ نَفۡسِيٓۚ إِنَّ ٱلنَّفۡسَ لَأَمَّارَةُۢ بِٱلسُّوٓءِ إِلَّا مَا رَحِمَ رَبِّيٓۚ إِنَّ رَبِّي غَفُورٞ رَّحِيمٞ ٥٣ ﴾

And I do not acquit myself. Indeed the soul is a persistent enjoiner of evil, except those upon which my Lord have mercy. Indeed, my Lord is forgiving and Merciful.

(Yusuf, Q12: 53).

The second type of Nafs is called Nafs Lawwāmah which makes man to blame himself of his deeds. In other words, he criticizes himself in good and bad things. Man regrets of what he misses of good deeds. In Surah al-Qiyāmah, Allah says:

﴿ وَلَآ أُقۡسِمُ بِٱلنَّفۡسِ ٱللَّوَّامَةِ ۝٢ ﴾

And I swear by the reproaching soul (to the certainty of resurrection).
(al-Qiyāmah, Q75: 2).

Nafs al-Muṭma'innah is the third type of Nafs as contained in surah al-Fajr where Almighty Allah states:

﴿ يَٰٓأَيَّتُهَا ٱلنَّفۡسُ ٱلۡمُطۡمَئِنَّةُ ۝٢٧ ٱرۡجِعِيٓ إِلَىٰ رَبِّكِ رَاضِيَةٗ مَّرۡضِيَّةٗ ۝٢٨ ﴾

(To the righteous it will be said), O reassured soul, Return to your Lord, well pleased and pleasing (to Him).
(al-Fajr, Q89: 27-28)

The three types of Nafs (soul) categorically indicate how human souls are developed. The first one is proned to commit evils, and without checking it, it leads to man's perdition. The second makes man to blame himself of his deeds, and the third one is where man achieves full rest and satisfaction. When man's soul reaches the last level of development, he attains the pleasure of Allah and enters the heaven (Al-jannah)

2.7 The Science of Embryology and the Qur'an:

The Greeks were the first people who carried out scientific studies on embryology. This dates back to the 5th century B.C. The well known scientist among the Greeks included Hippocrates (460-370 B.C) who was recorded as the father of Medicine and Aristotle (384-322 B.C) who examined chick embryos and postulated that the development of man was the same to that of the chicken. Moore *et al* (1990:15) pin pointed that the writings of Aristotle and Galen dominated the early part of historical record. From that time (circa 200C.E) in the Literature of Western Science, no major advances in man's knowledge of embryology were recorded.

From the time of Aristotle and until the 16th century, certain misconceptions were made on the nature of human embryo; which was said to develop from a coagulum (clot) of blood and seed, according to Aristotle. Another misconception according to Moore *et al* (1990:15) was that, it was the menstrual blood which was greatly considered to give rise to the embryo. It was not until the 18th century that people came to know that sperm and ovum necessitates conception. In line

with the explanation above, an attempt would be made to explain the nature of human embryonic development from one stage to the other in the light of the Qur'an and modern science.

2.7.1 Creation of Man in three Veils of Darkness

The Glorious Qur'an introduces the concept of human developmental stages where it says:

﴿ خَلَقَكُم مِّن نَّفْسٍ وَٰحِدَةٍ ثُمَّ جَعَلَ مِنْهَا زَوْجَهَا وَأَنزَلَ لَكُم مِّنَ
ٱلْأَنْعَٰمِ ثَمَٰنِيَةَ أَزْوَٰجٍ يَخْلُقُكُمْ فِى بُطُونِ أُمَّهَٰتِكُمْ خَلْقًا مِّنۢ
بَعْدِ خَلْقٍ فِى ظُلُمَٰتٍ ثَلَٰثٍ ذَٰلِكُمُ ٱللَّهُ رَبُّكُمْ لَهُ ٱلْمُلْكُ لَآ إِلَٰهَ
إِلَّا هُوَ فَأَنَّىٰ تُصْرَفُونَ ﴿٦﴾ ﴾

He created you from one soul, then He made from it its mate, and He produced for you from the grazing livestock eight mates. He creates you in the womb of your mothers, creation after creation within three darknesses, that is Allah your Lord. To Him belongs dominion. There is no deity except Him, so how are you averted?

(az-Zumar, Q39:6)

According to their exposition of the above verse, Ibn Kathir (2003:361-362) and Al-Mahalli (1431A.H:1321) highlight that, the mentioning of *"He creates you in your*

mother's womb" means He (Allah) forms us in our mothers' wombs. This formation is according to stages. Originally everyone of us is a Nutfah. Then becomes an Alaqah. The embryo is later changed to Mudghah. Allah changes this Mudghah to become bones which are covered with flesh and nerves and veins, and the soul is breathed into him, and he becomes another type of creation.

With regard to the three veils of darkness mentioned in Q39:6 above as pointed by Ibn Kathir (2003:362), they include the darkness of the womb, the darkness of the placenta which blankets and protects the child, and the darkness of the belly. This was the view of Abu Malik (d.63A.H), Ad-Dahhak, As-Suddi, Ibn Abbas (d.68A.H), Ikrimah (d.107A.H), Mujāhid (d.103A.H) and Qatādah (d.117A.H).

Tha'alabi (d.877A.H:316) mentions in his Tafsir of the above verse (Q39:6) that, the three veils of darkness that protects the child include the back of the father, the womb of the mother and the chorion located on abdomen.

Based on the above verse, during the time of creation according to Albārudi (n.d:85) and Naik (2001:56) man is

protected by three veils of darkness which include the following:-

1. Anterior abdominal wall of the mother.
2. The uterine wall: it is the place in which the foetus is nourished. The foetus is protected by muscles and ligaments found within it.
3. The amnio-chorionic membrane is the last veil that protects the foetus.

There is compatibility between embryology and Qur'an in this regard. The Qur'an mentions that Allah protects the foetus in three veils of darknesses and this has been mentioned by embryologists.

2.7.2 The stages of Human Embryonic Development

The Glorious Qur'an revealed in the 7th century C.E contains descriptions of how Almighty Allah created human beings, from the time of conception up to the time when they are delivered. There are six distinct stages of biological process of human creation which are explained as follows:

2.7.2.1 The Nuṭfah (Minute Quantity of sperm) Stage:

According to the saying of Allah (SWT) in the Glorious Qur'an, man's origin of creation at the initial stage was sound clay. This is a fact mentioned in the following verse:

﴿ وَلَقَدْ خَلَقْنَا ٱلْإِنسَٰنَ مِن صَلْصَٰلٍ مِّنْ حَمَإٍ مَّسْنُونٍ ﴿٢٦﴾ ﴾

And We did certainly created man out of clay from an altered dried mud.

(al-Hijr, Q15:26)

The first man created (Adam) was from clay, as pointed in the above verse. Al-Mahalli *et al* (1431AH:754) explained that this clay is hard and it makes sound when hitted (knocked) by something as any dried clay, which is the same as "putrid"

After the initial creation of Adam (A.S) from sounding clay, (inorganic substance), his children (progeny)'s nature of creation changed from clay to a new phenomenon of creation (that is biological process, which subsumes different stages of human creation.

According to http://www.acryfromanhonestsoul.com/main.htm (2008:4-5) in: Moore (2003), human development begins at fertilization when the sperm unites with an ovum to form a

unicellular organism called Zygote... The beginning of every individual is marked by this cell. This scientific statement compliments with Qur'anic statement in Surah al-Insan which says:

﴿ إِنَّا خَلَقْنَا ٱلْإِنسَٰنَ مِن نُّطْفَةٍ أَمْشَاجٍ نَّبْتَلِيهِ فَجَعَلْنَٰهُ سَمِيعًۢا بَصِيرًا ۝٢ ﴾

Indeed, We created man from a sperm-drop mixture that We may try him. And We made him hearing and seeing. (al-Insan, Q76:2)

Ṭabari (d.1426 A.H:87) states that the meaning of '*We have created man from nutfah (drops) of mixed semen*' is that Allah created progeny (offspring) of Adam (A.S) from nutfah (the fluid of man and that of woman. According to him, nutfah is any small quantity of water in a container. When these fluids are mixed, it is called "amshaj". Ṭabari therefore states that, man is created after the two opposite sexual partners mate, as a result of which the fluid of man (sperm) gets mixed with the fluid of a woman (ovum). Hassan al-Basri (d.101A.H) states that "mashaja" means the drop of man's fluid which is mixed with woman's fluid

Albarudi (n.d:107) maintains that according to Mujahid (d.103A.H) Allah (SWT) created a child from the fluid of man and woman and this is the reason why He mentions in the Qur'an:

﴿ يَٰٓأَيُّهَا ٱلنَّاسُ إِنَّا خَلَقۡنَٰكُم مِّن ذَكَرٖ وَأُنثَىٰ وَجَعَلۡنَٰكُمۡ شُعُوبٗا وَقَبَآئِلَ لِتَعَارَفُوٓاْۚ إِنَّ أَكۡرَمَكُمۡ عِندَ ٱللَّهِ أَتۡقَىٰكُمۡۚ إِنَّ ٱللَّهَ عَلِيمٌ خَبِيرٞ ١٣ ﴾

O mankind, indeed We have created you from male and female and made you people and tribes that you may know one another. Indeed the most noble of you in the sight of Allah is the most righteous of you. Indeed Allah is knowing and Acquinted.

(al-Hujurat, Q49:13).

According to his commentary on the above verse, Ṭabari (1426A.H:309) states that Almighty Allah mentions that O mankind; We initiated your creation from the fluid of male (man) and the fluid of female (meaning women). Ibn kathir (2003:206) on the other hand comments that, the meaning of Q49:13 is that Almighty Allah created mankind from single soul (Adam) and from him He created his wife (Hawwa).

Albarudi (n.d:108) states that Ibn Hajar al-Asqalāni (n.d) in his book Fathul Bāri, under the Book of Destiny mentions that what nuṭfah means, which refers to the sperm and its origin, and this sperm is a small drop of water. He further states that, when the fluids of man meets the fluid of a woman through sexual intercourse and Allah (SWT) intends to create an embryo from that, then He paves the way for that.

According to Albarudi (n.d: 108), Ibn Qayyim al-Jawziyyah (d.751A.H/1350 C.E) pointed that, the sperm of man alone cannot give birth to a child, until it is mixed up with ovum of female at a particular time.

The views upheld by scholars above clearly indicate that nutfah amshaj refer to the fluid of man and woman (when they are mixed together). This is what modern scientists (biologists) referred to as the "gametes".

Allah mentions that, He created man from nutfah. According Ibn Kathir (1975:30), the Glorious Qur'an mentions this in not less than 11 verses, such as the following.

﴿ يَٰٓأَيُّهَا ٱلنَّاسُ إِن كُنتُمْ فِى رَيْبٍ مِّنَ ٱلْبَعْثِ فَإِنَّا خَلَقْنَٰكُم مِّن تُرَابٍ ثُمَّ مِن نُّطْفَةٍ ثُمَّ مِنْ عَلَقَةٍ ثُمَّ مِن مُّضْغَةٍ مُّخَلَّقَةٍ وَغَيْرِ مُخَلَّقَةٍ لِّنُبَيِّنَ لَكُمْ ۚ وَنُقِرُّ فِى ٱلْأَرْحَامِ مَا نَشَآءُ إِلَىٰٓ أَجَلٍ مُّسَمًّى ثُمَّ نُخْرِجُكُمْ طِفْلًا ثُمَّ لِتَبْلُغُوٓا۟ أَشُدَّكُمْ ۖ وَمِنكُم مَّن يُتَوَفَّىٰ وَمِنكُم مَّن يُرَدُّ إِلَىٰٓ أَرْذَلِ ٱلْعُمُرِ لِكَيْلَا يَعْلَمَ مِنۢ بَعْدِ عِلْمٍ شَيْـًٔا ۚ وَتَرَى ٱلْأَرْضَ هَامِدَةً فَإِذَآ أَنزَلْنَا عَلَيْهَا ٱلْمَآءَ ٱهْتَزَّتْ وَرَبَتْ وَأَنۢبَتَتْ مِن كُلِّ زَوْجٍۭ بَهِيجٍ ﴿٥﴾ ﴾

O people, if you should be in doubt about Resurrection, then (consider that) indeed, We created you from dust, then from a sperm drop, then from a clinging clot, and then from a lump of flesh, formed and unformed-that We may show you. And We settle in the wombs whom We will for a specified term, then We bring you out as a child, and then (We develop you) that you may reach your (time of) maturity. And among you is he who is taken in (early) death, and among you is he who is returned to the most decrepit (old) age so that he knows, after (once having) knowledge, nothing. And you see the earth barren, but When We send down upon it rain it quivers and swells and grows (something) of every beautiful kind. (al-Hajj, Q22:5)

Naik (2001:52) states that, scientists have confirmed in recent times that only one out of an average of three million sperms is required for fertilizing the ovum. This indicates that

only 1/3,000,000 part which is the same as 0.000003% of the sperm's quantity that are emitted is needed for fertilization.

Albarudi (n.d:107) mentions that according to Ibn Abbas, (the best Qur'anic commentator), the mixture of germinated drop as indicated in (Q76:2) above refers to the fluid of man and that of the woman, when they are mixed. The embryo changes from one stage of development to another, one condition to the other, and colour to another colour. During the time of the Prophet (SAW), a Jew asked him: O Muhammad (SAW) with what is man created from? The Prophet (SAW) replied:

> "يا يهودي من كل يخلق من نطفة الرجل ومن نطفة المرأة" (رواه أحمد).
> *O Jew, (he is) created from both the man's Nutfah and the woman's Nutfah. (small quantity of sperm).* (Musnad Ahmad, Vol. 1, p. 465).

Describing the Nutfah stage, Moore (1990:24) identifies five phases, including the following:

2.7.2.2 Al-ma'ud-Dáfiq (gushing fluid):

The Qur'an indicates that the male discharge gushes forth as shown in Surah at-Tariq, which says:

﴿ فَلْيَنظُرِ ٱلْإِنسَٰنُ مِمَّ خُلِقَ ۝٥ خُلِقَ مِن مَّآءٍ دَافِقٍ ۝٦ ﴾

So let man observe from what he was created. He was created from a fluid ejected

(at-Tāriq, Q86:5-6)

Man as indicated in the above verse was created from a mingle drop of sperm. Mingle drop of sperm means that the female ovum has to be fertilized with the male sperm before a new child can be born. If the Arabic verb for emitted contained in the verse above is gramatically analysed, it means that the discharging is self-emitting and thus motile.

In order for fertilization to take place according to Moore (1990:24), modern science has proved that the spermatozoa must be active and motile. In addition, the female discharge which contains the ovum is expelled to the fallopian tube and for fertilization to occur, it must be moving within it

2.7.2.3 *Sulālah* (Quintessence):

This refers to the selection from the male and female fluids. This is stated in the Qur'an as follows:

﴿ ثُمَّ جَعَلَ نَسْلَهُۥ مِن سُلَٰلَةٍ مِّن مَّآءٍ مَّهِينٍ ۝٨ ﴾

Then He made his posterity out of the extract of a liquid disdained. (as-Sajdah (Q32: 8)

The above verse shows that, it is not from all the fluid discharged by man that Allah creates. A special selection is made before creation occurs. Sulálah is therefore the Qur'anic term used for this selection. One spermatozoan out of several millions discharged by man which goes through the ovum is selected. Another meaning of Sulálah is gentle extraction as indicated by Naik (2001:53) and Moore *et al* (1990:27). The Sulálah which also means quintessence of liquid is shown in a Hadith which the Prophet (SAW) said:

"ما من كل الماء يكون الولد" (صحيح المسلم، كتاب النكاح).

It is not from all the fluid that the offspring is created
(Muslim, Vol. 4, Kitab an-Nikah).

The germinal fluids of both male and female that contains gametes is referred to as Sulálah. Zindani *et al* (2000:37) points that, Islamically, fertilization does not occur from all the fluids discharged by the male and female, it is only a minute part of it that is selected. This is also contained

in Surah al-Muminun (Q23:12) in which Almighty Allah indicates that, man was created from quintessence.

It was as a result of fine calculation that Allah combined the elements contained in clay. These elements are proportionately and harmoniously distributed in the body at birth. The body is programmed to make use of them in due proportion and to dispose of any surplus. 2kg of calcium is contained in the human body, should there be decrease in this amount, our teeth could be broken as a result of munching an apple. 120 grams of potassium is also needed in our body, should there be any decrease of this, it may lead to fatigue, intestinal troubles, muscle cramps and palpitations. Our body also needs 2-3 grams of zinc, if this value is lowered, it could lead to impotence, loss of memory, decrease of the capability to act, and weakening of the senses of smell and taste. Our muscle could be weakened, our arteries and heart muscles could be hardened as a result of insufficiency of selenium according to (www.Qur'anmiracles. com/articles/ asp?id=49, (2008:1).

The analysis above indicates that, Allah combined the constituents of clay as raw material for the creation of man in ideal proportions. One of the manifestations of the omniscience of Allah is regarding His creation of man from such ordinary matter. What demonstrates Allah's matchless design is careful combination in due proportion of all the human body's constituents. (www.Qur'anmiracles .com/articles/asp?id=49 (2008:1)

The word Sulálah (quintessence) is used in different perspectives in the Qur'an. In Chapter 32:78 for instance, the Sulālah used here refers to germinal or despised fluid. This is shown as follows:

﴿ ٱلَّذِىٓ أَحۡسَنَ كُلَّ شَىۡءٍ خَلَقَهُۥۖ وَبَدَأَ خَلۡقَ ٱلۡإِنسَٰنِ مِن طِينٍ ۝٧
ثُمَّ جَعَلَ نَسۡلَهُۥ مِن سُلَٰلَةٍ مِّن مَّآءٍ مَّهِينٍ ۝٨ ﴾

Who perfected everything which He created and began the creation of man from clay. Then He made his posterity out of the extract of a liquid disdained.
(as-Sajdah, Q32:8-9)

On the other hand, Q23:12 quoted below indicates that man was created from quintessence of clay. This shows that the first stage of man's creation is from dry dust or inorganic

matter which later became an organic matter or from spiritual phenomenon to basic human biological process of creation. On this, Allah says:

﴿ وَلَقَدْ خَلَقْنَا ٱلْإِنسَٰنَ مِن سُلَٰلَةٍ مِّن طِينٍ ﴿١٢﴾ ثُمَّ جَعَلْنَٰهُ نُطْفَةً فِى قَرَارٍ مَّكِينٍ ﴿١٣﴾ ثُمَّ خَلَقْنَا ٱلنُّطْفَةَ عَلَقَةً فَخَلَقْنَا ٱلْعَلَقَةَ مُضْغَةً فَخَلَقْنَا ٱلْمُضْغَةَ عِظَٰمًا فَكَسَوْنَا ٱلْعِظَٰمَ لَحْمًا ثُمَّ أَنشَأْنَٰهُ خَلْقًا ءَاخَرَ ۚ فَتَبَارَكَ ٱللَّهُ أَحْسَنُ ٱلْخَٰلِقِينَ ﴿١٤﴾ ﴾

And certainly did We create man from an extract of clay. Then We placed him as a sperm-drop in a firm lodging (i.e the womb). Then We made the sperm-drop into a clinging clot, and We made a clot into a lump of flesh), and covered the bones with flesh; then We developed him into another creation. So blessed is Allah, the best of creators.

(al- Muminun, Q23:12-14)

According to Baghawi (1417A.H:411), the later day scholars stated that between one stage of man's creation and the other ie. between Nuṭfah to 'Alaqah, there are 40 days.

'We clothed the bones with flesh' means Allah clothed the bones with muscular flesh and then brought it forth as another creation. The Qur'anic exegetes have divergent opinion on this particular phrase. Ibn Abbas (d. 68AH), Mujāhid

(d.103AH), Ikrimah (d.107A.H) Dahhak (d.212A.H), and Abu Āliya (d. 90AH) explained that, it means breathing the ruh (soul) into him (the person to be created). Qatādah (d.117A.H) said, it means the firm establishment of the foetus. Hassan (d.101A.H) held another view that it refers to creating man as a male or female. Awfa (d.73A.H) reported from Ibn Abbas (d.68A.H) who explained that, it refers to the changes that occur after birth from the time of crying of the baby to the period of breast feeding up to the stage of sitting, standing, walking, up to the time when suckling stops, extended to the time of his eating and drinking, and up to the period of his maturity.

The meaning of '*so blessed be Allah, the Best of Creator*', is that Allah (SWT) deserve to be honoured and praised most, because He is the only one that creates and programmed things.

Imam Ṭabari (1426AH:14-16) in his Tafsir pin pointed the meaning of '*We clothed the bones with flesh*' in which he said that it refers to the breathing of the soul (to the foetus) as a result of which he changes into another creation of human

stature. Before that, man happens to be in a condition of being a nutfah (minute quantity of sperm), changed to 'Alaqah (leech), then changed to Mudghah (chewed like substance) and then to izam (bone formation)

Breathing the soul into him may take the meaning given above, and it may take the meaning of human being, just like how the soul was breathed into his father, Adam, after his being moulded with clay with which Allah created him. The meaning of *'We brought it forth as another creation'* refers to creating man without the clay that was used in the initial stage. The above analysis clearly indicates that human creation at the initial stage was from dried or sounding clay. This phenomenon was changed to biological process of creation in which man and woman have sexual intercourse before a child is created.

In analyzing the teachings of the above verse (Q23:12), Ibn Kathir (2003:635) asserts that the first man (Adam) was created from sticky Tin (clay). According to Qatādah

(d.117A.H), in a Hadith, Imam Ahmad (d.241A.H) recorded from Abu Musa (R.A) who said that the Prophet (S.A.W.) said:

> "إن الله خلق آدم من قبضة قبضها من جميع الأرض فجاء بنوا آدم على قدر الأرض، جاء منهم الأحمر والأبيض والأسود وبين ذالك والخبيث والطيب وبين ذالك" (رواه أحمد).
> *Allah created Adam from a handful which He picked up from throughout the earth, so the sons of Adam came forth accordingly, red and white and black and in between, evil and good and in between* (Musnad Ahmad, vol. 4, P. 400).

Man's origin according to the above Hadith was clay. Different earth surface (sand) were combined to form this clay. This is the reason why some people are white, black, in between and some are good while others are bad and in between in relation to their behaviours and characters. Almighty Allah created human beings from water and dust, this is the reason why our body is made up of about 2/3 of water. By the time water is mixed with dust, clay is produced, which is the origin of man (inorganic matter stage).

2.7.2.4 Nutfah Amshāj (Drop of Fluid Mingled):

Allah created man from a drop of sperm. When the fluid of man and woman meet and are mixed together according to

Ibn Abbas (R.A), it is called Nuṭfah amshāj. After this, then man changes from stage to stage, one condition to the other, and colour to colour as pointed by Ibn Kathir (2003:284). A similar explanation was made by Succesors of the Companion (R.A) such as Alhassan (d.120AH), Ar- Rabih (d.136AH), Ikrimah (d.107A.H), Mujāhid (d.103AH), etc. According to them, Amshāj is the mixing of the man's fluid with the fluid of the woman. Naik (2001:54) highlights more on what Nuṭfah Amshāj really means, where he points that, it refers to mingled fluid of male and female gametes that is minute in quantity. It also refers to the mingled liquids or spermatic fluid that is formed of various secretions which emanate from different glands. In Surah al-Insan Allah says:

﴿إِنَّا خَلَقْنَا ٱلْإِنسَٰنَ مِن نُّطْفَةٍ أَمْشَاجٍ نَّبْتَلِيهِ فَجَعَلْنَٰهُ سَمِيعًۢا بَصِيرًا ۝٢﴾

Indeed, We created man from a sperm-drop mixture that We may try him. And We made him hearing and seeing.

(al-Insan, Q76:2),

In the above verse, Allah has shown that He created man from Nuṭfah Amshāj (a minute quantity of mingled sperm or mingled fluid) in order to try him. Man is also given the

faculties of hearing and seeing to enable him hear and see things. Ali (1983:1655) buttresses that these faculties given to man have meaning. Man should therefore act as a vicegerent of Allah and is given the free-will in matters of worship.

The development of this stage according to Moore *et al* (1990:29) continues with proper maintenance of the Nuṭfah's shape but dividing it into smaller and smaller cells called blastomeres; until it forms a spherical mass of cells called morula. This happens four days later. A blastocyst is formed by the nuṭfah five days after fertilization, as the morula's cells separate into two parts. Scientists have recently observed that both male and female equally participate in the formation of human or animal zygote. For instance, Hertwig (1875 C.E) and Van Bender (1880) C.E have proved this fact. This clearly indicates the compatibility of modern science and Qur'an.

2.7.2.5 Taqdeer: (Genetic programming)

Taqdeer as defined by Moore *et al* in Zindani (2000:151) refers to "planning", "determining" and "programming". The dominant traits of the embryo and other traits that will affect him are determined by Almighty Allah in this stage.

During this stage of the nutfah, the chromosomes of male and female (parents) are mixed and formed into diploid pairs. This happens in the early formation of the nutfah Amshāj. It is this genetic mixture according to Moore (1990:29) that determines the characteristics of the child, his sex and what it will inherit from its parents and ancestors. To buttress the nature of Nutfah during this stage, Allah stated thus:

﴿ مِنْ أَيِّ شَيْءٍ خَلَقَهُۥ ﴿١٨﴾ مِن نُّطْفَةٍ خَلَقَهُۥ فَقَدَّرَهُۥ ﴿١٩﴾ ﴾

From what thing (i.e substance) did He create him? From a sperm drop He created him and destined for him.

(Abasa, Q 80:18-19).

The origin of man according to the above verse is that he is biologically created from sperm. It is the sperm of man that fertilizes the ovum and then if Allah wills, man is created. This tells us that the origin of man is indeed lowly. Moulded man in due proportion based on the understanding of Ibn Kathir (2003:361) as stated in the above verse, refers to determining by Allah the life span of man, his sustenance, his deeds and whether he will be among the companions of the hell-fire or

paradise as portrayed in Hadith four of an-Nawawi's collection, quoted before.

On the other hand, moulding man, which is the same as planning for his creation according to Ibn Abbas (d.68A.H) refers to planning man's hands, legs, eyes, height, disposition, countenance, and the organs which occur immediately after fertilization.

The determination of the sex of embryo happens during the taqdir process of the nutfah amshāj (drop of mingled fluid). Zindani *et al* (2000:43 & 151) further elucidates that, the sex of the embryo is determined in three stages: during the taqdir (programming) sub-stage of the nutfah, in the lahm stage when sexual glands continue with the process of development and in the nash'ah (fetal growth stage) when the external genitalia of the foetus begins to differentiate in the 9th week. In the 12th week, a male foetus can be distinguished from a female due to the appearance of external genital organs.

Albarr (1996:90) in Langman (1975) elaborated that the embryo passes into an indifferent stage, both in the gonads and the external genitalia. It is in the 6th week that an

indifferent gonads are formed, but it is impossible to differentiate between the two sexes. It is in the 8th week that it become differentiated into male gonads (testes) or female gonads (ovaries). This clearly corroborates with the saying of the Prophet (S.A.W) who explained in a Hadith transmitted by Imam Muslim (d.261AH) that the angel is instructed to fashion the sex of the embryo at the 6th week (between 40-42days).

2.7.2.6 Harth (Implantation)

The Harth phase is the last stage of the nutfah stage. The Arabic word 'Harth' according to Moore (1990:31) is the same in meaning with the word 'al-ghars.' Harth refers to implantation. In this stage, the blastocyst is implanted into the endometrium or uterine wall and this happens in the last phase of the nutfah stage. This process is considered the same as the soil cultivation and lining of the uterus in the soil in which the seed develops. Owing to the substances that are released from cells which will form the placenta and eventually, the blastocyst embeds "roots" itself into the endometrium, just as a seed embeds itself into the soil. In Surah al-Baqarah, Almighty Allah says:

﴿ نِسَآؤُكُمْ حَرْثٌ لَّكُمْ فَأْتُوا۟ حَرْثَكُمْ أَنَّىٰ شِئْتُمْ ۖ وَقَدِّمُوا۟
لِأَنفُسِكُمْ ۚ وَٱتَّقُوا۟ ٱللَّهَ وَٱعْلَمُوٓا۟ أَنَّكُم مُّلَٰقُوهُ ۗ وَبَشِّرِ
ٱلْمُؤْمِنِينَ ﴿٢٢٣﴾ ﴾

Your wives are a place of cultivation (i.e sowing of seed) for you, so come to your place of cultivation however you wish and put forth (righteoness) for yourselves. And fear Allah and know that you will meet him. And give good tidings to the believers.

(al-Baqarah, Q2: 223)

Almighty Allah teaches man as indicated in the above verse on the affairs of sex. This is something that is permitted if performed legally. Every person with the exception of Prophet Adam, Hawwa and Isah (A.S.W.S) comes to this world as a result of the sexual contact of a man and a woman. Sex as outlined by Ali (1983:88) is compared to a husband's tilth. By the time man have sex with his wife, he sows the seed in order to reap the harvest. Man chooses his own time and mode of cultivation. The seed is not sown out of season nor cultivated in a manner capable of injuring or exhausting the

soil. The nutfah stage begins in week one of conception and ends in the second week. (Moore *et al* 1990:24).

It is very important to state here that, Allah does some wonderful things in man's creation, in that He created him from a nutfah (drop) which involves various sub-stages as indicated above. In human body, there are other secretions that are discharged at one time or the other, as enumerated by Zindani *et al* (2000:51). These secretions include milk, mucus, saliva, semen, sweat, tears and urine. All these secretions have their roles to play in the body and it is hardly found that one secretion is mixed up with the other. Even if they do, they are temporarily separated.

The nature of children, especially during their infancy stage of development is that, they get themselves very close to their mothers. A question may be asked here. Why do small children love their mothers more than the fathers? Some people in an attempt to answer this question suggest that it is because of the nature of care provided by the mother and the fact that the mother breastfeeds the baby before it is fully grown up. This seems to be correct. However, a learned

scholar, Marwali (n.d:12) elucidates that children love their mothers very much than their fathers because the origin of their creation is the sperm and ovum when they are mixed. The sperm of man comes from his loins, that is his back, but that of the woman (ovum) comes from the bones of her chest, between the clavicle and the breast. This clearly indicates that the location of the ovum produced by women is more close to where it descends, than the sperm of man. This is the reason why the child goes closer and loves the mother by far than the father.

One important thing to take note about the first stage of man's creation is that when the sperm fertilizes the ovum, the embryo takes the form of nuṭfah and this nuṭfah consists of the male and female discharge including the mingled genetic material according to Zindani *et al* (2000:50). The Qur'an also contains this basic fact on the origin of mankind, where Allah states:

﴿ يَٰٓأَيُّهَا ٱلنَّاسُ إِنَّا خَلَقْنَٰكُم مِّن ذَكَرٍ وَأُنثَىٰ وَجَعَلْنَٰكُمْ شُعُوبًا وَقَبَآئِلَ
لِتَعَارَفُوٓاْ إِنَّ أَكْرَمَكُمْ عِندَ ٱللَّهِ أَتْقَىٰكُمْ إِنَّ ٱللَّهَ عَلِيمٌ خَبِيرٌ ﴿١٣﴾ ﴾

O mankind, indeed We have created you from male and female and made you people and tribes that you may know one another. Indeed, the most noble of you in the sight of Allah is the most righteous of you. Indeed, Allah is knowing and Acquinted.

(al-Hujurat, Q49:13).

It is very interesting to ask a question like this: where does the nutfah settles before the second stage of embryonic development? The Glorious Qur'an further explains that the nutfah (minute quantity of sperm) rests in the uterus and this takes the equivalence of the Arabic word qarar meaning a place of settlement as indicated in the following verse:

﴿ ثُمَّ جَعَلْنَٰهُ نُطْفَةً فِى قَرَارٍ مَّكِينٍ ﴿١٣﴾ ﴾

Then We placed him as a sperm-drop in a firm lodging (i.e the womb).

(al-Muminun, Q23:13).

It is in the uterus of the mother that the foetus lodges for nine or more months, depending on Allah's wish. The functions of the uterus according to Zindani *et al* (2000:48) are that it nourishes, protects, accommodates and assists in its (foetus) growth. The foetus also enjoys the protection of three veils of darkness explained earlier. These three veils of

darkness are the anterior abdominal wall, uterine wall and amnio chorionic membrane. These are indicated in Q39:6 quoted before. This fact is also confirmed by modern embryologists.

2.7.3 The 'Alaqah (Leech like substance) stage:

The 'Alaqah stage is the second stage in man's creation, which is mentioned in chapters 22:5, 40:67, 75:36-40, 96:1-3 of the Glorious Qur'an. According to Ibrahim (1997:6), the word 'Alaqah, being an Arabic word has three literal meanings:-

(i) leech

(ii) suspending thing and

(iii) blood clot

In the 'alaqah stage, an embryo is compared to a leech, because of the nature of the two, i.e they have common similarity. (Moore *et al* 1990:31). At this stage, the embryo is nourished from the mother's blood which is similar to the leech which feeds on the blood of some animals which it attaches itself to.

Secondly, 'Alaqah is also referred to as "suspended thing". It is called suspended thing because the embryo during this stage is suspended in the womb of the mother.

Blood clot is the third meaning of the 'Alaqah stage. During this stage as argued by Ibrahim (1997:8) one finds that, the external appearance of the embryo and its sacs is similar to that of a clot of blood. The presence of relatively large amounts of blood present in the embryo during this stage is the reason why 'Alaqah is regarded as the clot of blood stage which starts in the 3rd week after conception. The circulation of blood in the embryo during this stage does not happen until the end of the third week as buttressed by Moore *et al* (1990:33). Thus, at this stage the embryo is like a clot of blood.

After the first stage of embryonic development (nutfah), there is continuous accumulation of cells. This makes the embryo to become more solid according to Zindani *et al* (2000:119). When the embryo reaches 21 days, it attaches itself to the placenta through the umbilical cord and acquires the shape of a leech. This describes the external nature of the

embryo at the 'alaqah stage. As for the internal structure, blood clot describes it. There is relationship between the external and internal structures, because blood forms in the blood vessels in the form of isolated islands. Its vessels therefore looks similar to that of a coagulated blood due to the nature of the blood that circulates very slowly.

2.7.4 *The Mudghah (Chewed like substance) Stage*

Mudghah is the third stage in the embryonic development. The meaning of the Arabic word 'Mudghah' refers to something that is chewed (having marks of teeth) or something that is small and tacky which can be put in the mouth like gum (Naik, 2001:58). The descriptions of the Mudghah made above are scientifically correct. Some Qur'anic commentators like Shawkāni (n.d:436), defines Mudghah as, "a piece of meat of a small size that can be chewed". The embryo is approximately 10cm in length. This stage cover the 5th and 6th week of pregnancy. If one were to take a piece of gum and chew it in his/her mouth and then compare it with an embryo at the mudghah stage, it would look like a chewed substance. This is because at the back of

the embryo, the somites somewhat resembles the marks of a teeth in a chewed substance as explained by Iqbal (2008:2) in Moore et al (2003).

During the Mudghah stage, after the formation of the embryo and the placenta, the growth process rapidly increase as a result of the embryo's reception of its nutrients and energy. It is characterized by the appearance of somites which are the bodily masses from which the bones and muscle will form. According to Moore *et al* (1990:36), the following points are very important in the description of the processes of this period:

1. There is a continuous change in the appearance of the somites or imprints just as the teeth imprints change on a substance depending on each act of chewing.
2. Due to the modifications in its centre of gravity, the embryo turns in its position, as new tissues form which is the same as to how a substance changes as a result of chewing.
3. The back of the embryo becomes curved just as a chewed substance becomes curled before it is swallowed.

4. Due to the somites formation, the internal characteristics of the embryo at this stage are partly differentiated and partly undifferentiated into organ enlarge. This is shown in Surah al-Hajj which states:-

﴿ يَٰٓأَيُّهَا ٱلنَّاسُ إِن كُنتُمْ فِي رَيْبٍ مِّنَ ٱلْبَعْثِ فَإِنَّا خَلَقْنَٰكُم مِّن تُرَابٍ
ثُمَّ مِن نُّطْفَةٍ ثُمَّ مِنْ عَلَقَةٍ ثُمَّ مِن مُّضْغَةٍ مُّخَلَّقَةٍ وَغَيْرِ مُخَلَّقَةٍ
لِّنُبَيِّنَ لَكُمْ ۚ وَنُقِرُّ فِي ٱلْأَرْحَامِ مَا نَشَآءُ إِلَىٰٓ أَجَلٍ مُّسَمًّى ثُمَّ نُخْرِجُكُمْ
طِفْلًا ثُمَّ لِتَبْلُغُوٓا۟ أَشُدَّكُمْ ۖ وَمِنكُم مَّن يُتَوَفَّىٰ وَمِنكُم
مَّن يُرَدُّ إِلَىٰٓ أَرْذَلِ ٱلْعُمُرِ لِكَيْلَا يَعْلَمَ مِنۢ بَعْدِ عِلْمٍ شَيْـًٔا ۚ وَتَرَى
ٱلْأَرْضَ هَامِدَةً فَإِذَآ أَنزَلْنَا عَلَيْهَا ٱلْمَآءَ ٱهْتَزَّتْ وَرَبَتْ وَأَنۢبَتَتْ مِن
كُلِّ زَوْجٍۭ بَهِيجٍ ۝ ﴾

O people, if you should be in doubt about Resurrection, then (consider that) indeed, We created you from dust, then from a sperm drop, then from a clinging clot, and then from a lump of flesh, formed and unformed-that We may show you. And We settle in the wombs whom We will for a specified term, then We bring you out as a child, and then (We develop you) that you may reach your (time of) maturity. And among you is he who is taken in (early) death, and among you is he who is returned to the most decrepit (old) age so that he knows, after (once having) knowledge, nothing. And you see the earth barren, but When We send down upon it rain it quivers and swells and grows (something) of every beautiful kind.

(al-Hajj, Q22:5)

In the above verse, a description on the stage of man's physical growth from nothing until he completes this life's cycle is made in words whose beauty, accuracy, and comprehensiveness can be fully understood especially by biologists.

The meaning of partly formed and partly unformed or partly differentiated and partly undifferentiated as indicated in the phrase of verse. 5 of Surah al-Hajj (above) refers to miscarried foetus, formed or unformed. This clearly shows that Mudghah stage is divided into two as explained above in Q22:5. Allah sends an Angel after the passage of 40 days of conception to breathe the soul into it and then forms it by His will whether handsome or ugly, male or female, its provision, life span, and whether it will be among the blessed or wretched are written by the angel, as buttressed by Ibn Kathir (2003).

In his commentary of the above verse, Al-Mahalli et al (1431A.H:959-960) and Qurtubi (1423A.H:328) posit that Almighty Allah addressed mankind that if they are in doubt about Resurrection, they should remember that He created

their father (Adam) from dust, then later created his progeny (offspring) from nutfah (mixed drops of male and female sexual discharge), then from a clotted or thick coagulated blood, changed to a little lump of flesh, some formed (fully fashioned) and some unformed (that is miscarriage). According to Qurṭubi (1423A.H:329), nuṭfah means sperm, it is called nuṭfah because of its littleness. It is a small drop of water. 'Alaqah (the second stage) signifies coagulated or very reddish blood. The next stage called Mudghah resembles a piece of meat that can be chewed.

Qurṭubi (1423A.H:331-332) also explains the views of some commentators of the Qur'an on the meaning of the phrase *'partly formed and partly unformed'* as contained in Q22:5 above. According to him, Farra'i (d.207A.H) was of the view that, "partly formed" refers to complete creation and partly unformed refers to miscarriage. Ibn al-Arabi (n.d:1271) said partly formed refers to the embryo whose creation begins, and partly unformed means the embryo that is not shaped. Ibn Zaid opined that, partly formed means the embryo that

Almighty Allah creates its head, hands, and legs, and partly unformed refers to the one in which nothing is created.

The meaning of partly formed according to Ibn Abbas (R.A) refers to what is living and partly unformed refers to miscarriage.

In order to expound the meaning of partly formed and partly unformed as contained in Q22:5 mentioned above, Anas bn Malik (d.93A.H) narrated a Hadith in which the Prophet (S.A.W) said

"وكل الله بالرحم ملكا فيقول: أي رب نطفة، أي رب علقة، أي رب مضغة، فإذا أراد الله أن يقضي خلقها قال: أي رب أذكر أم أنثى؟ أشقي أم سعيد؟ فما الرزق؟ فما الأجل؟ فيكتب كذالك في بطن أمه" (رواه البخاري).

Allah put an angel incharge of the uterus, and the angel says, 'O Lord (it is) semen, O Lord, (it is now) a clot!O Lord (it is now) a piece of flesh. And then if Allah wishes to complete its creation, the angel asked, 'O Lord (will it be) a male or a female? A wretched (evil doer) or a blessed (doer of good)? How much will his provisions be? What will his age be? So all that are written while the creature is still in the mother's womb.

(Bukhari vol.8, Hadith 594)

The above Hadith indicate that, an angel is given an assignment as regard to examining the stages an embryo undergoes while in his mother's womb. It should be understood that when the embryo is in each stage, the angel informs the Almighty Allah. This does not mean that, the latter does not know the condition of the embryo. The Creator knows better than the angel, but He only wishes to entrust the angel to write the sex, fate, provision, and age of the embryo. All these issues are written by the angel when Almighty Allah decides.

2.7.5.1 The 'Izam (Bony formation stage)

The fourth stage in the development of human embryo is the 'Izam stage. This is the stage in which bones begin their formation, although not so uniformed throughout the body. Moore *et al* (1990:37) expresses that cartilaginous skeleton of bones is acquired by the foetus after the Mudghah stage. The development of bone in the limbs begins in the limb buds of embryo from mesenchymal cells. It is during the 7th week that the primary ossification centres appear in the femur and the sternum (breast bone) and the maxilla (upper jaw) during the

8th and 9th week. On the formation of bones in our bodies, the Qur'an draws our attention where it says:

﴿ أَوْ كَالَّذِى مَرَّ عَلَىٰ قَرْيَةٍ وَهِىَ خَاوِيَةٌ عَلَىٰ عُرُوشِهَا قَالَ أَنَّىٰ يُحْىِۦ هَٰذِهِ ٱللَّهُ بَعْدَ مَوْتِهَا ۖ فَأَمَاتَهُ ٱللَّهُ مِاْئَةَ عَامٍ ثُمَّ بَعَثَهُۥ ۖ قَالَ كَمْ لَبِثْتَ ۖ قَالَ لَبِثْتُ يَوْمًا أَوْ بَعْضَ يَوْمٍ ۖ قَالَ بَل لَّبِثْتَ مِاْئَةَ عَامٍ فَٱنظُرْ إِلَىٰ طَعَامِكَ وَشَرَابِكَ لَمْ يَتَسَنَّهْ ۖ وَٱنظُرْ إِلَىٰ حِمَارِكَ وَلِنَجْعَلَكَ ءَايَةً لِّلنَّاسِ ۖ وَٱنظُرْ إِلَى ٱلْعِظَامِ كَيْفَ نُنشِزُهَا ثُمَّ نَكْسُوهَا لَحْمًا ۚ فَلَمَّا تَبَيَّنَ لَهُۥ قَالَ أَعْلَمُ أَنَّ ٱللَّهَ عَلَىٰ كُلِّ شَىْءٍ قَدِيرٌ ﴿٢٥٩﴾ ﴾

Or consider such an example) as the one who passed by a township which had fallen into ruin. He said,"how will Allah bring this to life after its death?". So Allah caused him to die for a hundred years; then He revived him. He said, how long have you remained a day or part of a day". He said, "Rather you remained one hundred years". Look at your food and your drinks; it has not changed with time. And look at your donkey; And We will make you a sign for the people. And look at the bones of (this donkey)-how We raise them and then We cover them with flesh. And when it became clear to him, he said "I know that Allah is over all things competent". (al-Baqarah, Q2:259)

The above verse is connected to the story of a man (Uzair) who was despaired when he saw how Almighty Allah destroyed

a particular city (Jerusalem). He wondered how Allah can resurrect them. The man's life was taken and he stayed as a dead person for one hundred years. When he was given life again, he saw his food (grapes, figs and juice) intact but found his donkey dead and nothing but its bones are left. And before the man's eyes, the bones of the donkey were re-united, clothed with flesh and blood and restored to life, within shortime. This happened before Uzair's eyes (Ali, 1983:105).

The verse also draws our attention to the bones and invites us to closely examine it. Our skeletons according to Microsoft Encarta (2007:2) in msencxml://content/701639266?masterwnd=394426 & connect=0 & display=printex,in human body there are morethan 300 bones when a person is first born, but an adult has 206 bones of different sizes. Man's ability to jump, run, bend and sit depends on the towers made of bones connected with each other by joints and ligaments. For example, turning the page of a book or writing necessitates the concurrent action of our shoulder, elbow, wrist, and fingers without being

aware of the fact that it is the skeleton that performs this act, by Allah's will.

On the other hand, www.classbrain.com/artaskcb/publisharticle-145.shtml mentions that at birth the human body has about 350 bones. By the time adulthood rolls around, some of our bones have fused together to give us a total of 206 bones in our body.

The above idea of man having more than 300 bones when he is first born and adult having 206 bones of different sizes as mentioned by Microsoft Encarta programme is different from the views made by some prominent commentators of Qur'an such as Alusi (n.d), as pointed previously on page 74. According to him, the bones created by Almighty Allah in human body are 248.

The two different ideas regarding the number of bones in human body should not be regarded as contradiction. According to Science, there are morethan 300 bones in human body (when a child is born). As the child grows, the bones continue decreasing until they become 206. The adult skeleton according to www.enotes.com/homework-help (2011:1) consist of 206 bones in human body.

This depends on the size of the child, nature of his growth and the fact that some bones are fused into others. It is not therefore suprising to find two persons of the same age with different number of bones.

The skeletal system consists of structures composed of bones or cartilage or both which provide a framework for the vertebrate body and serve as attachment for muscles. According to www.Qur'anmiracles.com/articlesaspiid=59, (2008), this skeletal system performs independently the duty which it has been charged. The joints are fixed where the movement is deemed to involve danger like in the pelvis and skull, while in hips or shoulders they are mobile. Cervical vertebrate permit the head to revolve around its axis up to 180 degree. Thus, one does not have to turn his body to look around. The ribs protects the lungs and heart to ensure proper and safe functioning without being exposed to any hazard. The function of the skeletal system is that it supports the body like the columns and beams of a building. One wonders, however, that while the frame in modern building forms 60-70% of the weight of the building, the human

skeleton forms only 15% of the body weight. Highly resistant is the structural frame. The thigh bone for example in vertical position can carry a weight of one ton. Solidity and elasticity co-exists (www.Qur'anmiracles.com/articles. asp?id=59, 2008)..

The skeleton also has a lubricating system. There is regular lubrication of every joint in our body with special oily substances. The embryo during this stage is straightened and more erect and acquires a more evenly rounded body. This stage is also characterized by the formation of organs necessary for viability (Moore, 1990:38). On this, the Qur'an in Surah al-Infiṭar states:-

﴿ ٱلَّذِى خَلَقَكَ فَسَوَّىٰكَ فَعَدَلَكَ ۝٧ فِىٓ أَىِّ صُورَةٍ مَّا شَآءَ رَكَّبَكَ ۝٨ ﴾

Who created you, proportioned you and balanced you? In whatever form He will has He assembled you.

(al-Infitar, Q82:7).

The above verse elucidates that, Allah not only created man but also fashioned him in due proportion and gives him extra-ordinary capacities and the means where he can fulfill his high destiny. This is elaborated by Ibn Kathir (2003:392)

where he states that, the verse means that Allah made man complete, straight with perfect balance and proportion in stature. Man is fashioned by Allah in the best forms and shapes, as stated in Surah at-Tin (the Fig):

﴿ لَقَدْ خَلَقْنَا ٱلْإِنسَٰنَ فِىٓ أَحْسَنِ تَقْوِيمٍ ۝٤ ﴾

We have certainly created man in the best of stature.
(at-Tin, Q95:4).

Al-Mahalli *et al* (1431A.H:1704-1705) elaborates the meaning of Q82:7 quoted before by stating that Almighty Allah fashioned man at this ultimate degree of perfection that He endowed him with a perfect stature, having no hand taller than the other or a leg shorter than the other, all the while enjoying organs function at such a perfect degree of perfection.

Man's nature of creation as mentioned in Q82:7 and 95:4 above is quite different from other creatures of Almighty Allah. Man is provided with good structure in his physical body – having two legs and hands equal to each other. He is given ten fingers in his two hands and ten toes in his two legs which are meant for holding, grasping things, eating food and walking. Man is provided with 2 breasts, 1 tongue for speech and other

purpose, two ears for hearing, 2 eyes for sight, 1 nose (with two holes) for smelling odours and many other systems such as respiratory system, digestive system, nervous system, and the like. All these are provided, so that man can use them to ponder on the greatness of the Creator and serve Him. Allah (SWT) draws the attention of man regarding his creation where He states:

﴿ وَلَقَدْ خَلَقْنَٰكُمْ ثُمَّ صَوَّرْنَٰكُمْ ثُمَّ قُلْنَا لِلْمَلَٰٓئِكَةِ
ٱسْجُدُوا۟ لِءَادَمَ فَسَجَدُوٓا۟ إِلَّآ إِبْلِيسَ لَمْ يَكُن مِّنَ
ٱلسَّٰجِدِينَ ﴿١١﴾ ﴾

And We have certainly created you, (O mankind) and given you (human) form. Then We said to the Angels "Prostrate to Adam", so they prostrated except for Iblees. He was not of those who prostrated.

(al-A'araf, Q7:11)

Allah (SWT) created Adam (A.S) and gave him the noble shape of human being while we were deposited in his loins. Gumi (1426A.H:444) elucidates that, one of the blessings Allah bestows upon us (human beings) is that Allah created our father (Adam) and gave him a deserving physique and gave us

the same shape which we now have. Allah (SWT) has not made our shape like that of animals. The moment somebody sees some animals, he begins to feel unease, when he looks at them, due to either their nature of shape or harmfulness.

On the other hand, Allah has made man different from other Dabbah (moving creatures) because, he is given the strength in his reasoning faculty and he is given wisdom as well. Ahmad bn Hanbal (d.241A.H) recorded a Hadith from Busr bn Jahsh al-Quraishi who said that one day, the Messenger of Allah (S.A.W) spat in his palm and placed his finger on it. He then said:

قال الله عز وجل: "يا ابن آدم أنى تعجزني وقد خلقتك من مثل هذه؟ حتى إذا سويتك وعدلتك فشيت بين بردين، والأرض منك ونيد، فجمعت ومنعت حتى إذا بلغت التراقي قلت: أتصدق وأنى أوان الصدقت؟" (رواه أحمد).

Allah the Mighty and sublime says: "O son of Adam! How can you escape me when I created you from something similar to this (spit)? Then I fashioned you and made your creation balanced so that you walk between the two outer garments. And the earth Has a burial place for you. So you gathered wealth and withheld until your soul reached your collar bone (ie death comes). Then at that time

you say I will give charity now. But
how will there be time for charity?
(Musnad Ahmad, Vol. 4 Hadith 210)

During the 7th week of embryonic development as asserted by Moore (1990:39), the embryo has a bent back, which looks like the shape of letter C during the Mudghah stage, but in the 'Izam stage, the bending position is straightened and the surface becomes more even because of the disappearance of depressions and prominences.

2.7.5.2 *The Primitive streak of Man*

No complete explanation can be made on the bones of human body without giving a highlight on the primitive streak. This is because it is regarded as the origin and the seed from which all human beings shall be raised by Almighty Allah on the great day of judgement, as mentioned in some Ahādith of the Prophet (S.A.W.). The primitive streak is the last bone in the vertebral column. In his book *"The Developing Human"*, Moore *et al* (2003:72) points that, the primitive streak is formed at the beginning of the third week. So also the three germ layers from which all tissues and organs of the embryo develop happens in the third week. In addition, continuous

migration of cells which result to the growth and elongation of the embryonic disc are from the primitive streak.

There are some scientific miracles regarding the primitive streak which are witnessed in some of the Prophetic Hadith. The primitive streak according to http://www.acryfromanhonestsoul.com/main.htm (2008:9) in Hamed (n.d) which is very significant in the formation of embryo was only discovered in the second half of the 20th century. The Prophet (S.A.W) in a Hadith reported by Abu Huraira (R.A) said:

"ويبلى كل شيء من الإنسان إلا عجب ذنبه فيه يركب الخلق" (سنن ابن ماجه).

Dust devours all man except the Primitive streak from which he is created and from which he will be recreated.
(Sunan Ibn Majah, Vol. 2, Hadith 4266).

There are some basic issues which can be deduced from the above Hadith as follows:

(i) The primitive streak is smallish in nature.

(ii) It does not get decayed, no matter the length of man's stay in the grave.

(iii) Man shall be recreated by Almighty Allah from the primitive streak on the day of judgement.

In the Glorious Qur'an, man's attention is drawn by Almighty Allah where He states:

﴿ أَوَلَمْ يَرَ ٱلْإِنسَٰنُ أَنَّا خَلَقْنَٰهُ مِن نُّطْفَةٍ فَإِذَا هُوَ خَصِيمٌ مُّبِينٌ ﴿٧٧﴾ وَضَرَبَ لَنَا مَثَلًا وَنَسِىَ خَلْقَهُۥ ۖ قَالَ مَن يُحْىِ ٱلْعِظَٰمَ وَهِىَ رَمِيمٌ ﴿٧٨﴾ قُلْ يُحْيِيهَا ٱلَّذِىٓ أَنشَأَهَآ أَوَّلَ مَرَّةٍ ۖ وَهُوَ بِكُلِّ خَلْقٍ عَلِيمٌ ﴿٧٩﴾ ﴾

Does man not consider that We created him from a (mere) sperm-drop-then at once he is a clear adversary? And he presents for Us an example and forgets his (own) creation. He says "Who will give life to bones while they are disintegrated"?. Say "He will give them life who produced them the first time; and He is of all creation, knowing". (Yasin, Q36:77-79).

The above three verses hinted that man was created from (a very minute quantity of liquid). Just as he was created by Almighty Allah, he shall also be recreated after his death on the resurrection day. Turning man into a bony tissue (primitive streak) does not raise any difficulty to resurrect him back as he was initially created.

In order to prove that the primitive streak does not get decayed, Azzindani and Aljilāni conducted an experiment in the former's house at San'a in 2003. They burnt one of the two vertebras of 5 coccyx on stones, using a gas gun that lasted for 10 minutes. After they totally became combusted (the bones became red and then turned to black), they put the carbonised pieces in sterilised boxes and took them to the most famous analysis laboratory in San'a which is popularly called Al Olaki laboratory. When the pieces were analysed by al Olaki (a professor in histology and pathology), it was found that the cells of the bone tissues of the coccyx were not affected and they survived the burning. It was only the muscles, bone marrow cells and fatty tissues that were burnt. (Aljilani, 2003).

The primitive streak which diminishes until it becomes "an insignificant structure" can be likened to the seed which when rain water drops on it grows to full maturity, until it is harvested. This is because Almighty Allah compares resurrection to the growth of plant where He states as follows:

﴿ وَمِنْ ءَايَٰتِهِۦٓ أَنَّكَ تَرَى ٱلْأَرْضَ خَٰشِعَةً فَإِذَآ أَنزَلْنَا عَلَيْهَا ٱلْمَآءَ ٱهْتَزَّتْ وَرَبَتْ ۚ إِنَّ ٱلَّذِىٓ أَحْيَاهَا لَمُحْىِ ٱلْمَوْتَىٰٓ ۚ إِنَّهُۥ عَلَىٰ كُلِّ شَىْءٍ قَدِيرٌ ﴿٣٩﴾ ﴾

And of His signs is that you see the earth stilled, but when We send down upon it rain, it quivers and grows. Indeed, He who has given it life is the Giver of life to the dead. Indeed He is over all things competent.

(al-Fussilat, (Q41:39).

The verse above explains two important issues; the first is that, a barren land that is dried is revived to life by Almighty Allah and when a seed is sown in it, it grows. Just like the seed grows, Allah by His power can resurrect, human beings when they diminish, until they finally become the primitive streak. Primitive streak in this sense is regarded as a seed, that can be given life by Almighty Allah. Allah has the power to create even without the primitive streak or union of men and women through sex.

2.7.6 The Lahm (Muscular Flesh) Stage:

The embryo is a boneless lump. In due time, its cartilage tissue is transformed into bones as said in the Qur'an, followed by it being clothed in muscular flesh. The Arabic word "lahm" refers to muscular flesh, or clothing the bones with

flesh. This starts at the 7th week and continues throughout the 8th week (Zindani *et al* 2008:158). The bones and muscles simultaneously developed as discovered through the use of advanced microscopes and micro cameras introduced into the uterus.

The Glorious Qur'an describes accurately and superbly how the bones of an embryo were created and how they were clothed with flesh. Moore (2003) says on this:

> The bone structure develops inside this mass in what is called mesenchyma. The bones that are formed and covered in muscle; the word "lahm" applies to them.

Moore (1990:39) discusses that, this is the stage in which muscles are formed after the skeleton is erected in the previous stage. Definitive muscles in the trunk and limbs start their formation and the beginning of movement is noticeable. The muscles cloth the bones and proceed with the process of straightening and smoothing that begin in the previous period (Izam stage). At this stage, the gonads otherwise called the sex glands begin to differentiate into testes and ovaries during the eighth week. This stage is compatible with the following

Qur'anic passages in Surah al-Qiyāmah and Surah al-Infiṭar which state:

﴿ أَلَمْ يَكُ نُطْفَةً مِّن مَّنِيٍّ يُمْنَىٰ ﴿٣٧﴾ ثُمَّ كَانَ عَلَقَةً فَخَلَقَ فَسَوَّىٰ ﴿٣٨﴾ فَجَعَلَ مِنْهُ الزَّوْجَيْنِ الذَّكَرَ وَالْأُنثَىٰ ﴿٣٩﴾ ﴾

Had he not been a sperm from a semen emitted? Then he was a clinging clot and (Allah) create (his form) and proportioned (him). And made of him mates, the male and the female. (al-Qiyāmah, Q75:37-39).

﴿ الَّذِي خَلَقَكَ فَسَوَّاكَ فَعَدَلَكَ ﴿٧﴾ فِي أَيِّ صُورَةٍ مَّا شَاءَ رَكَّبَكَ ﴿٨﴾ ﴾

Who created you, proportioned you and balanced you? In whatever form He willed has He assembled you.
(al-Infitar, Q82: 7-8).

The above five verses summarize the nature of man's creation from being a nuṭfah (a minute quantity of sperm), changed to an 'Alaqah (a leech like clot), then a Mudghah (a chewed substance), changed to 'Izam (bone) and then the bones are clothed with muscle. It is in the lahm stage that Allah determines the sex of an embryo. The foetus can only be capable of moving after the formation of the muscles. The end of embryonic development happens by the end of 8th week according to embryologists.

2.7.7 The Nash'ah (Foetal Growth) Stage:

This is the last stage of human embryonic development, which starts in week 9 and continues till birth. Three meanings according to Moore *et al* (1990:41) can be given to this stage of development:

1. To initiate: This means that the functioning of different organ systems is initiated. For instance the hair follicles first appear in the 10th week, urine is formed by the kidney, bone marrow is formed by blood cells, etc.
2. To rise and increase: The length and weight of the foetus rapidly increases, beginning from the 12th week of the embryo.
3. To grow and develop: All organ systems of the body rapidly grow and extensively developed.

This period of development which is described in Surah al-Muminun (Q23:14) is regarded as the foetal period of development. The word ansha'anáhu used in the verse quoted before signifies causing him (man) to grow and attain the definitive human form. This stage is characterized by the following features according to Zindani *et al* (2000:96):-

(i) Development of the skeleton especially the bones

(ii) The appearance of nails on the fingers and toes

(iii) The appearance of fine hair on the skin which becomes differentiated into epidermis and hypodermis in the 12th week.

(iv) The testes begin to descend and the uterus, oviducts, and vagina develop.

(v) Due to the appearance of external genital organs there is possibility of differentiation of a male foetus from a female.

(vi) The establishment of voluntary and smooth muscles.

(vii) The brain and spinal cord get matured due to the overall physiological development of the nervous system.

(viii) Between the 9th and 12th weeks, the sizes of the body, head and limbs change and they become more balanced in their relative proportion, etc.

According to Albārudi (n.d:84), the description made in Qur'anic verses such as Q23:12-14 on man's creation reveals the mystery of creation. This is quite surprising for the

Prophet (S.AW) who did not have a teacher (in the Arabian desert), yet described a lot of facts that compliments the findings of modern scientists on embryology.

The nash'ah stage is described in the Glorious Qur'an in chapter 23:14 as quoted in the previous stage. The three meanings of the nash'ah which include initiating, to rise and increase and to grow and develop is understood by Qur'anic commentators according to Zindani *et al* (2000:96) to mean that, the foetus is developed into a creature that is capable of hearing, seeing and speaking.

Qurṭubi (1423A.H:109), ash-Shawkāni (1383A.H:476) al-Mahalli (1431A.H:452) and Ibn Jawzi (1384A.H:463) further elaborated the meaning of Nash'ah as, breathing the spirit into the foetus.

Another important issue that needs explanation in the verse (Q23:14) is that Almighty Allah used conjunction "*thumma*" or then with ansha'anāhu to show that the Lahm stage is followed gradually by nash'ah stage. The latter begins in the 9th week, but is delayed with an expression of its three meanings above until later. An example that can be seen in

this regard is that there is relatively slow growth in the period between 9th week and the end of 11th week, but in the 12th week there is rapid growth which entails the beginning of the use of ansha'anāhu. Zindani *et al* (2000:107) further added that, the development of certain organ systems initiation happens after the 8th week (lahm stage), but the changes in these organs become more clear after the 11th week. This clearly means that the nash'ah stage is fully expressed in week 12 because of the nature of delay. It begins in the 12th week. Hence the Glorious Qur'an indicates this delay by using the word thumma in the verse (Q23:14) quoted before.

It will be important to point out that, the verses of the Glorious Qur'an which subsume explanation on human embryology divided the man's period of development into three major stages. The first stage is called the nutfah or small quantity of fluid. The second stage is called takhliq or differentiation stage in which the development of human beings passes through successive sub-stages which cover the 'alaqah, mudghah, 'Izam and al-kisā bil lahm (clothing the bones with muscle). Each of these stages happens without any

interval of delay; hence the conjunction "fa" is used in the Qur'an to indicate that (Zindani, *et al* 2000:86).

2.8 The Concept of In-vitro Fertilization

Siddiq (2008:7) in http://www.paklinks.com/gs/religion-and scripture/299852-egg-don--defines In-vitro-fertilization as a biomedical method that is generally used, when due to obstruction, the sperm of the husband cannot reach the ovum. In this case, the ovum is removed from her ovary at the time of ovulation.

Ramalingam (1993:482) defines In-vitro-fertilization as a method in which married couple who cannot conceive a child can be helped to have one. This is commonly referred to as making a test-tube baby. Having a test-tube baby is an idea that helps in situations where the husband has low sperm count which makes the chances of fertilization to be rare due to non-production of sufficient sperm at each ejaculation. In addition, due to the blockage of the oviduct of a woman as a result of which sperm is prevented from meeting the ova produced by the woman monthly, the adoption of test-tube baby become useful.

In carrying out In-vitro fertilization, as stated by Ramalingam (1993:483), a matured ova is removed from the woman ovaries by the doctor and placed in special growing medium bubbles. After the sperms are collected from the husband, they are injected into the bubble. As a result of this, the ova becomes fertilized easily and then form embryos. After the formation of embryo, the doctor then goes ahead and places an embryo into the uterus of the woman. If this embryo becomes attached to the wall of the uterus, it will develop like any normal baby.

To examplify the practice of In-vitro fertilization, Papalia *et al* (1987:395) pointed that in England, a British gynaecologist (Patrick C. Steptoe), was permitted to extract an ovum from Mrs. Brown's ovary and allowed it to mature in an incubator. Having done that, the ovum was fertilized with a small drop of sperm of Mr. Brown (the husband). After the zygote has divided into eight cells, the embryo was implanted by the doctor in the uterus of the mother which enabled it to grow in a normal way. This was the first test tube baby that was born in 1978. The first twins born by this method was in

1981. This is followed by triplets in 1982, quadruplets in 1984 and in the same year (1984); 350 test tube babies had been born, about half in Austria.

Another common practice related to reproduction in the modern time is the issue of egg donation. According to Tatlor *et al* (1997:756), in circumstances when a woman is not able to produce eggs, egg donor is sometimes used. The technique developed for in vitro fertilization (as explained above) are applied to obtain the eggs. After the male sperm is used to fertilize the egg, the pre-embryos can be placed in the oviducts of the future mother.

Egg donation according to Tatlor et al (1997:757) refers to a process in which a woman donates egg to another woman who is unable to produce eggs. The woman who gives the egg is called egg donor.

2.8.1 Islamic Position on In-vitro Fertilization/Egg Donation

Before saying the stand of Islam on In-vitro fertilization and egg donation, there is need to point out that Almighty Allah states in the Glorious Qur'an as follows:

﴿ وَمِنْ ءَايَٰتِهِۦٓ أَنْ خَلَقَ لَكُم مِّنْ أَنفُسِكُمْ أَزْوَٰجًا لِّتَسْكُنُوٓا۟ إِلَيْهَا وَجَعَلَ بَيْنَكُم مَّوَدَّةً وَرَحْمَةً ۚ إِنَّ فِى ذَٰلِكَ لَءَايَٰتٍ لِّقَوْمٍ يَتَفَكَّرُونَ ﴿٢١﴾ ﴾

And His signs is that He created for you from yourselves mates that you may find transquility in them; and He placed between you affection and mercy. Indeed, in that are signs for a people who give thought. (ar-Rum, Q30:21).

The above verse describes beautifully the relationship between husband and wife. In other words, man cannot live without woman and vice versa. It stresses the fact that there are strong benefits derived from each other.

After marriage takes place, some couples may stay for many years without an issue. This could lead to separation of marriage. The infertility may be from the part of the man or woman or both. This needs the attention of gynaecologist who should investigate, prescribe drugs and give medical advise to the couple. Sometimes the husband spends huge amount of money due to this problem and the desired result may not be achieved. Therefore, in this type of situation, does Islam allow the couple to opt for In-vitro fertilization or egg donation? The answer to this question need analysis from the Islamic

Shari'ah point of view. To begin with, it will be proper to highlight that Almighty Allah states in the Qur'an as follows:

﴿ لِلَّهِ مُلْكُ ٱلسَّمَٰوَٰتِ وَٱلْأَرْضِ ۚ يَخْلُقُ مَا يَشَآءُ ۚ يَهَبُ لِمَن
يَشَآءُ إِنَٰثًا وَيَهَبُ لِمَن يَشَآءُ ٱلذُّكُورَ ﴿٤٩﴾ أَوْ يُزَوِّجُهُمْ ذُكْرَانًا
وَإِنَٰثًا ۖ وَيَجْعَلُ مَن يَشَآءُ عَقِيمًا ۚ إِنَّهُۥ عَلِيمٌ قَدِيرٌ ﴿٥٠﴾ ﴾

To Allah belongs the dominion of the heavens and the earth; He creates what He wills. He gives to whom He wills female (children), and He gives to whom He wills male.
Or He makes them (both) males and females, and He renders whom He wills barren. Indeed, He is knowing and competent.

(ash-Shurah, Q42:49-50).

According to the above verse, creations happen according to the will and plan of Almighty Allah. Having children is in His hands. Sometimes He gives male(s) or female(s) or both to a person. Whatever happens, a Muslim is being reminded to believe in whatever is destined for him. This is part and parcel of the articles of Iman (faith), without which a Muslim's faith is questionable.

Muslim couple who do not have an issue should go for medical check up. If after series of medical examination and treatment the result does not yield anything positive, they

should resort to prayer and should never loose hope, since everything is in the hands of Allah. As far as Islam is concerned, there is no disease without treatment. According to Zindani *et al* (2000:25), the Qur'an says:

﴿ يَٰٓأَيُّهَا ٱلنَّاسُ إِنَّا خَلَقْنَٰكُم مِّن ذَكَرٍ وَأُنثَىٰ وَجَعَلْنَٰكُمْ شُعُوبًا وَقَبَآئِلَ لِتَعَارَفُوٓاْ إِنَّ أَكْرَمَكُمْ عِندَ ٱللَّهِ أَتْقَىٰكُمْ إِنَّ ٱللَّهَ عَلِيمٌ خَبِيرٌ ﴿١٣﴾ ﴾

O mankind, indeed We have created you from male and female and made you people and tribes that you may know one another. Indeed the most noble of you in the sight of Allah is the most righteous of you. Indeed, Allah is knowing and Acquinted.
(al-Hujurat, Q49:13).

Man is reminded in the above verse that he comes to this world as a result of sexual contact between a man and a woman. Deviating from this way to my understanding is going against the Sunnah of the Prophet (SAW).

Under no circumstances should a Muslim practice something that is not approved of. To collect the sperm of man, put it in test-tube and then remove it and place it in mother's uterus and hope of giving birth to a baby has certain

implications from religious as well as medical point of view. The same thing applies to the practice of donating eggs.

Muslim scholars and experts in the field of medicine in 1986 organized a conference at Cairo titled *Islam and Contemporary Medical Affairs*, where the idea of In-vitro fertilization was discussed at length. The conclusion of the conference according to Zindani *et al* (2000:29) reads:

> If In-vitro fertilization between a married couple occurs during their lifetime, it is permissible as long as implantation is in the wife, otherwise, it is not permitted. As for the frozen embryos, the relationship between the married couple comes to an end in case of death or divorce. Moreover, both the Qur'an and Sunnah State that marriage is the only admissible way to have children, for it preserves and safeguards family ties, protects health and results in human values.

Furthermore, the Qur'an and Hadith as explained by Zindani *et al* (2000:30) have already provided solutions as regard to the controversy of manipulating embryonic cells, which is permitted if it is done with the aim of healing an embryo with disease. The Prophet (SAW) enjoined this and other treatment of diseases as lawful.

According to http://www.islamweb.net/emainpage/index.php?pageshowfatwa&op..., a question was raised by a Muslim sister on 10th Rajab, 1423 A.H/17th September 2002 as follows: My husband and I have not been able to achieve pregnancy naturally, after many visits to the doctor and performing many tests, he advised us to perform In-vitro fertilization (IVF). The doctor has informed us of two things that raised questions for us:

1. He said that he would like to freeze excess fertilized embryos for further use in another pregnancy between me and my husband. The frozen embryos were saved for up to one year. Does Islam allow this?
2. He told us that there is possibility of implantation of more than 3 embryos and that this is a risk factor to both the mother and the embryos. Therefore, he would removed the embryos if a large number does get implanted. Is this prohibited in Islam?

The answer to the above questions was stated as follows: The ruling for In-vitro fertilization depends on the way it is

done. If the doctor takes an egg from a wife and puts it in an external tube, fertilizes it with spermatozoid from the wife's husband, when the fertilized egg starts to reproduce and at a given stage, the doctor transfers it to the uterus of the wife herself and lets it implant on the wall of the uterus and develop as an embryo, this is permissible.

In 1404A.H/1983, the Islamic High Council issued a Fatwah in its 7th sessions as follows:

> Taking a female seed and a male one from a man and a woman who are husband and wife and doing an In-vitro fertilization for these seeds before planting the resulting embryo in the womb of the wife from whom the egg was taken is in principle acceptable in Islam, but it can raise some doubts due to what accompanies it.

The council further elucidates that In-vitro fertilization should not be practiced unless there is dire necessity to do so, with some conditions before doing it. The conditions include the following:

1. Under any circumstances, the private part of the Muslim woman must not be shown to anybody, except her husband, unless there is a lawful reason for doing so.

2. No doubt that the need for the woman to be treated for an illness is a lawful reason that gives her right to be exposed to a person other than her husband, but this should be in conformity with the necessity itself.
3. If there is a legal reason for the woman to be exposed to a person other than her husband for treatment, that person should be a Muslim woman, if there is one who can do the job, if not found then a non-Muslim woman, if not found, then a trustworthy Muslim doctor, if not found then, a non-Muslim doctor. This is the legal sequence. The council also maintained that it is unlawful for the patient woman to stay alone with an alien male doctor. Another woman or her husband should be with them. It also states that: "the need of the married woman as well as her husband to have a child is a sound reason and a legal one that makes lawful for this woman to seek treatment in the lawful way of artificial insemination. The Fiqh Council of Islamic Conference in 1407A.H. had given the same ruling (as stated above).

Considering the ruling of the above Fiqh Islamic Council, there is great wisdom. Restrictions was made as regard to exposing the private part of a Muslim woman. This has been permitted according to the Ijtihad of the Council under dire necessity. The sequentiality followed as regard to those who should see the woman's private part is really in order. First of all, Muslim woman is the first and the best to examine the patient, followed by a non-Muslim woman, then a trustworthy Muslim doctor and then the last option is allowed when the first three are not found at all. There is also wisdom in prohibiting the woman from isolating herself with the Muslim or non-Muslim male doctor because the Prophet (SAW) in his Hadith warns against doing that when he said:

> "لا يخلون الرجل بامرأة إلا مع ذي محرم"
> *No man should stay with a woman in seclusion except in the presence of Dhu mahram (a person within prohibited degree of marriage).*
> (Bukhari, Vol.7, Hadith 160).

When the opposite sex isolate themselves, the third party with them is Satan. If great care is not taken under this circumstances, it could lead to committing Zina (adultery)

which is categorically unlawful. According to the Qur'an, a Muslim should not go near to it. This is stated in the following verse:

﴿ وَلَا تَقْرَبُوا الزِّنَىٰٓ إِنَّهُۥ كَانَ فَٰحِشَةً وَسَآءَ سَبِيلًا ﴿٣٢﴾ ﴾

And do not approach unlawful sexual intercourse. Indeed, it is ever an immorality and is evil as a way. (al-Isra, Q17:32)

According to the above verse, (Q17:32) a Muslim is totally prohibited to go near Zina (unlawful sexual relations). This clearly indicates that when Islam prohibits something, it closes all the avenues to it.

There is a contrary view upheld by some scholars as elucidated by http://www.Islamweb.net/emainpage/index.php?page show Fatwa & Op ... These scholars have forbidden the practice of In-vitro fertilization because of the following reasons:

1. They fear that the woman might give birth to handicapped children and the operation itself might have bad consequences on the new born or the mother.

2. If the husband has a limited number of spermatozoids in his sperm and want to consider it in a bank specialized in conserving the sperm unchanged, is it lawful for him to do so? On this issue, there are different rulings made by Muslim scholars. Some of them think that this is lawful provided that any insemination should be done during the life time of the husband. Other scholars upheld that this is lawful even after the husband's death but before the expiration of the wife's iddah. A third group of scholars believe that any sperm that remains after the insemination was performed should be destroyed and not kept for future use. The same disagreement exists also as far as the woman's ovules are concerned before being fertilized and after the fertilization. It is due to the uncertainty about the concerned sperm or fertilized ovules in the banks of the embryos that serves as the reason for the prohibition. There is great probability that these embryos can get mixed, or that someone misuses them and might be given

to alien persons, and this leads the person to commit sin and cause mixture in lineage.

3. The probability of doubt about the lineage of the new born is left to the doctor who is the only one who can establish that he has done the insemination between the seeds of the two parts of the couple. This might lead to some doubts, because the doctor might have used a wrong mixture by mistake or he might have some pity on a woman who wants to conceive desperately and put an alien embryo in her uterus. Because of this reason, one should seek to have this operation done by a trustworthy Muslim woman doctor.

In 1410 A.H./1990, the Fiqh Council which is a sub-organization of the Islamic Conference issued a Fatwah about the above and maintained that:

1. Since it has been scientifically proved that unfertilized ovules can be stored and saved for future use, only the number that is to be planted each time should be withdrawn, to avoid having a surplus of fertilized ovules.

2. If there is surplus of fertilized ovules, these should be left without assistance, till they naturally die.
3. It is forbidden to take a woman's fertilized ovule and plant it into another woman's uterus. All precautions should be taken to avoid using a fertilized egg in a forbidden pregnancy.

According to http://www.onislaminet/english/ask-thescholar/ family/pregnancy-and..., Muslim jurists have allowed the use of In-vitro Fertilization only between legally married couples during their marriage. Thus, In-vitro-fertilization is permissible as long as the semen and ovum are from the couple who are legally married and the fertilization takes place during their marriage, not after divorce or the death of the husband. A divorced woman is not allowed to receive the fertilized ovum (embryo) from her ex-husband. Similarly, a widow is not allowed to take it after the death of her husband. Islam does not also permit the practice of surrogacy i.e. giving the embryo to another woman to carry on

the pregnancy in her womb. A Muslim is also not permitted to act as a surrogate mother.

In line with the views of those scholars who favour the idea of In-vitro fertilization, they have seen the legality of doing so, but restricted the practice between only married couples during their life time. The scholars also emphasized that no third party should be involved in In-vitro fertilization, so as to protect the nasab (lineage) of the child to be born by using this method.

On the other hand, Aleem and Raimi (2006:74) in their contribution regarding the permissibility of donating egg in Islam, explained that if any process involves a third party (such as surrogate mother), or that the egg of a woman is fertilized with the sperm of somebody beside her husband, this is totally prohibited. In this case, the sperm may come from a bank and the donor may not be known to the woman. Islam prohibits this in order to maintain proper family relationship. The children must know who their parents are, so as to bear their names with the names of the latter, in line with what the Qur'an says:

﴿ ٱدْعُوهُمْ لِآبَآئِهِمْ هُوَ أَقْسَطُ عِندَ ٱللَّهِ ۚ فَإِن لَّمْ تَعْلَمُوٓا۟
ءَابَآءَهُمْ فَإِخْوَٰنُكُمْ فِى ٱلدِّينِ وَمَوَٰلِيكُمْ ۚ وَلَيْسَ
عَلَيْكُمْ جُنَاحٌ فِيمَآ أَخْطَأْتُم بِهِۦ وَلَٰكِن مَّا تَعَمَّدَتْ
قُلُوبُكُمْ ۚ وَكَانَ ٱللَّهُ غَفُورًا رَّحِيمًا ﴿٥﴾ ﴾

Call them by the names of their fathers; it is more just in the sight of Allah. But if you do not know their fathers-then they are (still) your brothers in religion and those entrusted to you. And there is no blame upon you for that in which you have erred but (only for) what your hearts intended. And ever is Allah Forgiving and Merciful.

(al-Ahzab, Q33:5).

Any child who is born through In-vitro fertilization or egg donation not limited to married couple will not know his biological father whom to bear his name with. In order to avoid difficulty in tracing the geneology of the children, Islam warns against involving a third party in relation to giving birth. Children must know who their parents are, because that is even very significant when it comes to the issue of inheritance, should the parent or the child die. The prohibition of involving third party in giving birth is necessary in order to avoid any

confusion as regard to parenthood and child-parent relationship.

Al-Qardāwi (2005:222) maintains that Islam prohibits artificial insemination if the giver of the semen is other than the husband. It also condemned in totality, the idea of introducing any foreign element into it. He quoted Sheikh Shaltut in this regard who said:

> It is a despicable crime and major sin and classified in the same category as Zina. Zinah and artificial insemination by any one other than the husband both have the same nature and effect. That is in both cases, the tillage which exclusively belongs to the husband is intentionally inseminated by a stranger...

The above idea clearly portrays that artificial insemination (such as donating sperm) by anybody beside the husband is not only prohibited, but regarded as a crime which is punishable by hadd (stoning to death or flogging) according to the understanding of the Sheikh above.

2.9 Animals and their Evolution

Evolution as defined by Anees-u-din (n.d:107) is a comprehensive plan of sequence in all natural events. Life has

assumed various forms and the implication of evolution is that life in entirety has been derived from one or few simple living beings. Allah provided food for all organisms in the form of lower plants and animals before they come into existence.

Wadud (1971:172) discusses that, the Glorious Qur'an indicates that creatures in their evolutionary history have passed through various stages. At one particular stage, each creature temporarily remained and for further disposal, it is handed over to the next stage. At every stage, the nutritional needs of all creatures are known by Allah. Animals like human beings live in communities. This is evidently found in the Qur'an where Allah says:

﴿ وَمَا مِن دَآبَّةٍ فِي ٱلْأَرْضِ وَلَا طَٰٓئِرٍ يَطِيرُ بِجَنَاحَيْهِ إِلَّآ أُمَمٌ أَمْثَالُكُم ۚ مَّا فَرَّطْنَا فِي ٱلْكِتَٰبِ مِن شَيْءٍ ثُمَّ إِلَىٰ رَبِّهِمْ يُحْشَرُونَ ﴿٣٨﴾ ﴾

And there is no creature on (or within) the earth or bird that flies with its wings except (that they are) communities like you. We have not neglected in the Register a thing. Then unto their Lord they will be gathered.

(al-An'am, Q6:38).

The verse above reminds Muslims that Allah created many creatures on earth and these creatures live in

communities, just like human beings. The animals also move from place to place and can sense their surrounding, that is to say that they hear, see, taste, touch, and smell. The presence of animals on the land and sea is known to Almighty Allah, because He is the knower of the visible and the invisible things. Similarly, every thing according to the verse is being recorded in His book and He has full knowledge of them.

According to an explanation made on animals as contained in B.S.L. (2008:1), it is believed by scientists that there are more than ten million different kinds of animals on earth today. Some animals such as copepods cannot be seen by the naked eye due to their tiny nature except if microscope is used. The blue whale, being the biggest animal is more than 100 feet (30 meters) long with a weight of 300,000 pounds (136,000 kilograms).

Biological scientists also recognized the existence of animals in communities, as did the Qur'an more than 1440 years ago. For instance, according to Britannica Students Article (2008:7), animal kingdom is divided into groups, based on their structures. The first group is called phyla (group of

animals with different body plans). This phyla is divided into classes, the classes into orders and the orders into families. These families are further divided into genera (plural) or genus (singular) and each genus is divided into species. There is close relation among all members of the same species.

Obidiwe (2000:3) and Odunfa (1983:18-19) also point that, the major phyla of the animal kingdom is divided into 9, including protozoa, coelentarata, platyhelminthes (flatworms), nematode (roundworms), annelida (annelids) mollusca, (mollucs), arthropoda (arthropods), echinodermata, and chordata.

In terms of their structure according to Britannica Student Article (2008:9), animals are classified into two groups, viz:

1. Vertebrate Animals: These are the animals which have backbones and a central nervous system. Those that can serve as example under this group include amphibians, mammals, reptiles, birds and fishes. The vertebrates move through water, air, and over the ground with great speed and

skill. Some fly and swim. Animals under this class are only about 5% and they are the most advanced group of animals.

2. Invertebrate Animals: These are the animals that do not have backbones. The typical examples of this class include arthropods. The arthropods include insects, such as lady bugs and house flies; crustaceans such as crabs, copepods and lobsters; arachnids such as ticks, scorpions and spiders, among other organisms, including centipedes and millipedes. The second type of the invertebrate animals are the worms such as tapeworms, hookworms, ringworms, etc. Mollucs, being the third category of the invertebrates include snails, octopus, squid, oysters, scallops, mussels, clams etc. Most animals are invertebrates and they are up to 95% of the animal species. (Britannica Student Article, 2008:7).

The above two classes of animals show a clear indication that they are divided into two groups of invertebrates and vertebrates based on their physical structure. Animals are divided into 3 if we consider the nature of their movement. This is supported by the Qur'an where Almighty Allah says:

﴿ وَٱللَّهُ خَلَقَ كُلَّ دَآبَّةٍ مِّن مَّآءٍ ۖ فَمِنْهُم مَّن يَمْشِى عَلَىٰ بَطْنِهِۦ وَمِنْهُم مَّن يَمْشِى عَلَىٰ رِجْلَيْنِ وَمِنْهُم مَّن يَمْشِى عَلَىٰٓ أَرْبَعٍ ۚ يَخْلُقُ ٱللَّهُ مَا يَشَآءُ ۚ إِنَّ ٱللَّهَ عَلَىٰ كُلِّ شَىْءٍ قَدِيرٌ ﴿٤٥﴾ ﴾

Allah has created even (living) creature from water. And of them are those that move on their bellies, and of them are those that move on two legs, and of them are those that walk on four. Allah creates what He wills. Indeed, Allah is over all things competent. (an-Nur, Q24:45).

Qurṭubi (1423A.H:571) analysed that the word "*dabbah*" used in the above verse (Q24:45) means every living thing that move on earth, including human beings. The angels and jinns are excluded from this, because we do not witness their nature of living and it has not been mentioned that they are created from water. The authentic explanation about them is that the angels are created from light and the jinns from flaming fire.

According to Qurṭubi (1423 A.H:571), the commentators of the Qur'an said that the water that Almighty Allah created the living creatures refers to nuṭfah. Nuṭfah according to Mahalli (1431A.H:1030) as used in this verse means the mixed drops of male and female sexual discharge.

Every Dabbah (moving creature) is created from water according to the above verse. That is why the history of evolution proves that life in entirety cannot be possible without water. Wherever water is found, life exists there either in actual or potential form.

Based on the nature of movement of animals as shown in the above verse, animals are generally classified into three. The first type is that which move by means of crawling or creeping. The examples of these animals mentioned by Wadud (1971:172) include worms and some of the reptiles such as snakes, centipedes, millipedes, spiders and insects. Fishes and sea animals do not actually walk, but their swimming is like "creeping on their bellies". Those that walk by using two legs include birds and man. Birds are many, because scientists are able to identify 30,000 varieties of birds according to B.S.L (2008:28). The third category of animals according to the verse are those that move on four legs, which are called quadrupeds. Most of the animals found in the world fall under those that move on four legs. Mammals are the typical example, in this case, animals like cow, sheep, dog,

hyena, camel, lion, and many more are further examples of quadrupeds.

The differences that exist among the animals either on the nature of their physical structure, shape, movement, and what they eat as food are great lessons to human beings who use their intellect to ponder on their creation. It shows the artistry, will, and power of Allah. This also enables the Muslims to have strong faith in Him (the Creator).

2.9.1 Species among Animals

Almighty Allah is the only One Who deserved the name Creator. Besides Him, nobody can create. Allah creates animals and placed them according to kingdoms, groups, and species. Had it been He wished to create animals to look alike, He could have done so. On the contrary, He created them according to species so that we reflect and ponder on this and have a firm belief in Him.

The Glorious Qur'an did not categorically mention the available species Allah created within the animal kingdom. However, it has indicated in chapter 24:45 that the origin of all animals is water and then classified them (animals) into three

groups based on the nature of their movement: some move by crawling, some move by using two legs and some use four legs. In chapter 2: 164, Allah indicates that He has created living creatures of all kinds and scattered them on earth. In chapter 6:38, Allah vividly informs us that all moving creatures scattered on earth are living in communities like ours. The provision of all living creatures as indicated in chapter 11:6 is in the hands of Allah. In chapter 22:18, Allah explains that whatever is in the heaven and earth including the moving (living creatures) prostrate themselves to Him. In some verses, Allah indicates that everything on earth and the heaven Glorify His name. This include animate and inanimate objects), but mankind do not comprehend how the aforementioned things celebrate Allah's praise.

The word 'species' according to Tatlor *et al* (1997:4) refers to a group of closely related organisms which are capable of interbreeding to produce fertile offspring. At times, organisms which are closely related genetically, can produce young ones together but the offspring will be infertile. For example, when a donkey and a horse mates, they can produce mule which is

infertile. In other words, the mule does not resemble either of them due to the fact that the two do not belong to the same species, and cannot reproduce. For example, although lion and tigers come from different species, but if a male tiger have contact with lioness, they can have fertile offspring called tiglon. The offspring of female tigers and male lions are not fertile. The habitat of the two animals are not the same. While the tigers live in the forest, lions live in plains. This, therefore, indicates that they are isolated ecologically.

Species within the animal kingdom are so many that, no one can exactly say their numbers. However, biological scientists have analyzed the following as examples of species within the animal kingdom. This is according to Encyclopedia Britannica (2008:2-28) and www.submissions.org/yes/yes-16html:

1. Mammals have 4000 species arranged in about 120 families and 20 orders.
2. There are about 30,000 variety of birds, divided into some 8,600-8,900 species.

3. Entomologists have named almost 1,000,000 species of insects, about 10,000 are regarded as pests insects, etc.
4. There are 2500 species of lizards, 2500 species of snakes, 250 species of turtles and 22 different kinds of crocodiles, etc.

2.9.2 Some Animals Mentioned in the Qur'an

Ibn Kathir (1975:40-49) buttresses that, Almighty Allah created the heavens, earth and what are between them such as the mountains, the trees, fruits, and other creatures on the land and in the seas for the use of mankind. The creation of animals is of paramount importance to man. They are used for transportation, carrying loads (luggages), and for consumption purposes, etc. The products of some animals like bees are used as medicine, (curing diseases). Ṭanṭāwi (1342A.H:117) maintains that, clothing and furnishings are made from their wool and hair of the cattle, among other benefits, and Allah made them to be subservient to us especially in terms of control.

The importance of creating animals is so great that some chapters of the Qur'an were named after some of them such as

Surah an-Nahl (The Bees) being the sixteenth chapter of the Qur'an. In chapter 2 (the Cow), the names of animals mentioned include the sheep, the goats, the camels and the oxen. So also the Qur'an in chapters 16:79, 24:79 and 67:19 pointed out the importance of the birds, and their creative nature. The nature of bees and their blessings is shown in Q16:68-69. As for the ants and how they live, the Qur'an in chapter 27:17-18 draws our attention. The nature of camels and their creation is contained in chapter 88:17-21, among other animals.

Tantāwi (1342A.H:151) pointed that animals in their relationship with man, are categorized into two. Some animals are beneficial to man and others are harmful. Al-Qazwini (672A.H:340) explains that, Allah created different animals which are found in the land and seas with amazing structures. Creating them in different forms is a sign for man to understand the greatness of Allah and have a firm belief in Him.

2.9.3 The *Bees*

The Bees are weak little creatures which are inspired by Allah to travel through the vast fields and feed from every kind of fruit, then gather it for wax and honey. They live in cavities of trees and rocks. Their house is the hive which consists of vertical-honey comb cells of pollen and honey. Describing the nature of the bee's home, Ibn kathir (2003:489) and Wadud (1971:85) stated that, it is a solid structure having hexagonal shapes and interlocking forms, without looseness in its combs. Almighty Allah permits the bees to eat from all fruits and to follow the ways He has made easy for it, wherever it intends to go in the vast spaces of high mountain valleys, and wilderness, without confusion, each bee comes back to its home where honey and its offspring are. This is called displacement by linguists. They have confirmed that out of all animals, only bees are capable of displacement. (Yule, 1985:21).

The Bees do alot of wonderful things through the guidance of Allah. The Qur'an categorically states:

﴿ وَأَوْحَىٰ رَبُّكَ إِلَى ٱلنَّحْلِ أَنِ ٱتَّخِذِى مِنَ ٱلْجِبَالِ بُيُوتًا وَمِنَ ٱلشَّجَرِ وَمِمَّا يَعْرِشُونَ ﴿٦٨﴾ ثُمَّ كُلِى مِن كُلِّ ٱلثَّمَرَٰتِ فَٱسْلُكِى سُبُلَ رَبِّكِ ذُلُلًا يَخْرُجُ مِنۢ بُطُونِهَا شَرَابٌ مُّخْتَلِفٌ أَلْوَٰنُهُۥ فِيهِ شِفَآءٌ لِّلنَّاسِ إِنَّ فِى ذَٰلِكَ لَءَايَةً لِّقَوْمٍ يَتَفَكَّرُونَ ﴿٦٩﴾ ﴾

And your Lord inspired to the bee, "Take for yourself among the mountains, houses (i.e hives), and among the trees and (in) that which they construct.
Then eat from all the fruits and follow the ways of your Lord laid down (for you). There emergies from their bellies a drink, varying in colors, in which there is healing for people. Indeed, in that is a sign for people who give thought.

(an-Nahl, Q16:68-69).

Ibn al-Arabi (n.d:1156) in his commentary of Q16:68 highlights that, wahy (inspiration) used in the above verse refers to what Allah (SWT) creates in the heart. As regard to the one applicable to animals, particularly the bees which is mentioned that Allah (SWT) inspires it, it means that Allah (SWT) guides it in terms of getting what will benefit it and being far away from what harms it and taking care of its food.

Ibn al-Arabi also pointed that, a drink of varying colour that comes forth from their bellies (the bees) refers to the honey that Allah gives as part of His blessing. This honey in

most cases is used on matters related to drinks, not eating, since it is a liquid. The colour of the honey according to him is reddish, white and sometimes yellow and it is either thick or thin, this depends on the nature of flower or leaves taken by the bees before producing the honey.

As regard to the importance of honey in which Almighty Allah mentions in the verse:- *"wherein is healing for men"*, Ibn Arabi (n.d:1157) quoted a Hadith, to show that some Companions of the Prophet (S.A.W) applied honey in treating diseases. The Hadith reads:

روى أن عوف بن مالك الأشجعي مرض فقيل له: الانعالجك؟ قال آتوني بماء سماء، فإن الله يقول: "وأنزلنا من السماء ماء مباركا"، وآتوني بعسل فإن الله يقول: "فيه شفاء للناس"، وائتوني بزيت، فإن الله يقول: "من شجرة مباركة" فجاءوه بذالك كله، فخلطه جميعا ثم شربه فبرئ" (والآية من سورة الرعد آية: ٤، وسورة ق، آية:٩، وسورة النور، آية: ٣٥)

It was narrated that Awf bn Malik al-Ashja'i (R.A) felt sick. It was said to him: should we treat (provide medicine) for you? He said, "bring me rain water as Allah (SWT) is saying: and We send down water from the sky (Q13:4). Bring honey to me, as Allah is saying:... Where in is healing for men (Q50:9). Bring me an olive, as Allah is saying:... lit from a blessed tree (Q24:35(. He mixed the three mentioned things together and drank, and then recovered.

The above Hadith has shown that, honey can be mixed with certain things and be taken as medicine. Doing this heals the disease by the permission of Almighty Allah. The Hadith further indicates that Muslims have been encouraged by the Prophet (S.A.W) to use honey so as to be healed from their ailments.

The verse above (Q16:68-69) shows that Allah, the Creator controls the sustenance of living beings. Inspiring the bee according to Tantawi (1342A.H:116), means that, Allah guides, instructs, and directs the bees to make its home in structures erected by man, and other places. It also collect, store, and distribute food for the benefit of human beings, etc.

The bees perform so many tasks which are too complicated to explain as pointed by (www.qu'ranmiracles.com/articles.asp?id=16). They distribute work in a hive, the ventilation of the hive, humidity and temperature, secreting wax, guarding the hive, discarding unwanted foreign matter, dead bees, among others are very surprising tasks. All these grandiose artistry are performed by the bees whose life time ranges from 5 weeks- 5 years

depending on whether it is a queen, drones or worker bees. In these, there is a sign for those who think about the powerful nature of Allah.

Inspiring the bees as stated in the above verse according to Zamakhshari (1385 A.H:373) and Mahalli *et al* (1431A.H:784) means that, Allah (SWT) showed it the way and guide it to make it house in parts of some mountains, trees and other places, that people made.

In the second verse (Q16:69) according to Mahalli (1431A.H:784), Allah (SWT) has made easy for the bees as regard to the path that leads them to attain. This clearly means that Allah shows the way for the bees to go and seek for nectar and to locate the flowers it will consume. The bees never loose their ways in doing so, since the Creator guides them.

As regard to the importance of honey mentioned in the verse, Al-Mahalli *et al* (1431A.H:785) assert that, since Almighty Allah used the indefinite article in the phrase: *There comes forth from their bellies, a drink of varying color where in is healing for men...*, it means that Allah cures all types of

disease with the honey, if He wills as to do so. The use of the indefinite article also makes the matter of healing a comprehensive matter for all diseases. Al-mahalli further stressed that, the healing produced by the honey is conditioned by the intention of he who consumes it.

The values of honey is not only mentioned in the Qur'an. There is a Hadith reported by Abu said Al-khudri (R.A) according to Ibn Arabi (n.d:1157), in which the value of honey is spelt out. The Hadith says:

وروى أن سعيد الخدري أتى النبي صلى الله عليه وسلم فقال: إن أخي يشكو بطنه. فقال: اسقه عسلا، ثم أتاه فقال: فعلت، فما زاده ذالك إلا استطلاقا. فقال صدق الله، وكذب بطن أخيك، اسقه عسلا، فسقى فبرئ".

A man came to the Prophet (S.A.W) and said "my brother has some abdominal trouble'. The Prophet (S.A.W) said to him, "let him drink honey. The man came for the second time and the Prophet (S.A.W) said to him, "let him drink honey". He came for the third time and the Prophet (S.A.W) said: "let him drink honey". He returned and said, "I have done that". The Prophet (S.A.W) then said, "Allah has said the truth, but your brother's abdomen has told a lie. Let him drink honey". So he made him drink honey and he was cured. (Bukhari, Vol. 7 Hadith 5683).

The above Hadith clearly shows that honey is used in curing abdominal disease. One important thing to remember is that, if a person takes honey as a result of any disease, it does not mean that he/she will instantly be cured. Curing depends on the will of Allah. It also depends on the time Allah wishes to cure a person. It is not the honey in the actual sense that cures a person, but Almighty Allah.

The bees, apart from supplying mankind with honey as explained by Omofoyewa (2010:98) in www.submissions.org/YES/YES-16html, help in keeping plants living and germinating well. Through cross pollination, they carry or move pollens on their bodies between different flowers. They are very essential workers of cross pollination. Within one minute, a honey bee can pollinate about 30 flowers by thrusting its nose into one flower after the other. If not because of the bees, almost half of the most beautiful flowers would have disappeared.

The bee society according to Wadud (1971:85) is made up of sixty five thousand bees in an average hive. These bees are divided into three categories:-

1. The queen: This is the mother of the colony which is reproductive. It lays eggs which is fertilized by the drones.
2. The worker bee: This is a female bee, otherwise called the soldier bee. They are sexually developed females who perform a number of functions such as collecting food for all the caste, making honey, airing, cleansing and defending the hive, building the comb, etc. It has a body that varies in length, which is between 1cm-3cm and that is divided into three parts: the head, thorax, and abdomen.
3. The drones: These are the third social class among the bees. Several hundreds are drones. Wadud (1971:85) hints that, it is the unfertilized eggs that produce drones or males

2.9.3.1 *Honey Dances of the Bees*:

Reference is made on the collection of nectar by the bees, in Surah an-Nahl. The female bees apart from producing honey according to www.qur'anmiracles.com/articles.asp?id=16, also collects raw material from flowers that is eventually transformed into honey. During this process of seeking the nectar, incredible phenomenon occurs. Naik (2001:41) points that the female or worker bee fills her nectar stomach after

discovering the supply of food in the field. It goes back to the hive to deposit the nectar it gathered or feed the young bees. In addition, it informs other fellow bees the exact direction and map to locate flowers (www.qur'anmiracles.com/articles.asp?id=16). This is called the 'Bee dance'. The meaning of the bee's movement, which is intended to transmit information between worker bees, has been scientifically discovered by the use of photography and other methods (Naik, 2001:41). A typical example of this is in relation to the research conducted by Von Frisch in 1973, on the behaviour and communication of the bees which earned him a Nobel Prize as a result of the research.

The dances of the bees indicates not only that, the scouts have found nectar or pollen and that the other workers should go out and seek it, but they are actually performing a wonderful charade that clearly gives an information to others about where and how to locate a new found source.

The Creator has endowed the bees with some wonderful things, in addition to what has been explained before. The wonderful thing which is of great interest is that, it makes

calculation when going back to the hive according to the sun's position. In every four minutes, the sun changes its position by one degree. In relation to the sun's position, the bee that has determined the location of her food also calculates its return journey as directly and correctly as possible. They are able to relate the position of their hives with the direction of polarized light that comes from the sun (www.qur'anmiracles.com/articles.asp?id=16). This is performed without any error. Pure co-incidence cannot explain all these calculations and harmonious existence within the hive. This signifies that all these are innates in them which is an endowment of Almighty Allah.

2.9.3.2 *The Uses of Honey*

Honey is a product of female bees. Before medical authorities in modern time confirmed the regenerative property of honey, the Qur'an in Surah an-Nahl Q16: 68-69 quoted above foretold the uses of honey. Communities all over the world have attested to the fact that honey has healing properties. The colours of honey vary as indicated in the Qur'an. Tantáwi (1342A.H:117) and Baghawi (1417A.H:29)

stated that, the colours of the honey ranges from dark brown to green, white and red, but the light yellow is preferable. The colour only changes due to the change in climatic, seasonal, and weather conditions and the sources where nectar is obtained. Ibn Kathir (2003:490) confirms that, the Qur'an recognises the nature of colours found in the honey. This is where Almighty Allah says:

﴿ ثُمَّ كُلِي مِن كُلِّ ٱلثَّمَرَٰتِ فَٱسْلُكِى سُبُلَ رَبِّكِ ذُلُلًا ۚ يَخْرُجُ مِنۢ
بُطُونِهَا شَرَابٌ مُّخْتَلِفٌ أَلْوَٰنُهُۥ فِيهِ شِفَآءٌ لِّلنَّاسِ ۗ إِنَّ فِى ذَٰلِكَ لَءَايَةً لِّقَوْمٍ
يَتَفَكَّرُونَ ﴿٦٩﴾ ﴾

Then eat of all the fruits and follow the ways of your Lord laid down (for you). There emerges from their bellies a drink of varying in colors, in which there is healing for people. Indeed, in that is a sign for a people who give thought.

(an-Nahl, Q16:69)

There are many uses of honey as stated by Adamu (2006:47). It has rich vitamin content and among its components, there are minerals such as calcium, potassium, magnesium, sodium, phosphorus and other metals including copper, hormones, iodine, iron, and Zinc. In addition, its sugar content is easily assimilated).

In his explanation on the medicinal values of honey, Al-Jawziyyah (2003:64-66) expresses that there are tremendous values that are derived from it. For instance, honey offers the bowel movement of an individual, cleanses the chest and liver, helps in producing urine, dissolves excess moisture, washes away the harmful substances that might be collected in the intestines and veins. In addition, the effects of opium and animal bites is cured with honey, especially if it is consumed hot and mixed with rose oil.

Honey also facilitates the functioning of the brain; it contributes to the production of blood to its cleansing and proper circulation. The requirement necessary for the proper functioning of our physiology is provided by honey. In dermatology and cosmetics, honey is used externally. Scientifically, it has been proved that honey contains almost all the food molecules that support growth and energy utilization. It contains carbohydrates, amino acids, vitamins and other essential elements. (Adamu 2006:47).

The values of honey are also indicated in the Hadith of the Prophet (SAW) where Jabir bn Abdullahi (may Allah be

pleased with him) reported that the Prophet of Allah (S.A.W.) said:

> "الشفاء في ثلاثة: في شرطة محجم، أو شربة عسل أي كية بنار، وانهى أعتى عن الكي" (رواه البخاري)
> *If there is any healing in your medicine, then it is in cupping, a gulf of honey or branding with fire (cauterization), (one of three), according to which suit the ailment, but I don't like to be cauterized (branded with fire).*
> (Bukhari, Vol. 7, Hadith 5683).

In the Hadith collections of Bukhari and Muslim, it is reported from A'isha (may Allah be pleased with her) who said that, the Messenger of Allah used to like sweet things and honey is one of them. Naik (2001:45) also confirms the fact that honey has a healing and antiseptic property. The example he gave on this is that during the World War II, the Russians used it to cover their wounds for healing. This was because fungus and bacteria would not grow in the wound because of the honey's density. The wonderful nature of honey is very great. It is great in the sense that honey is the excreter of the bees which is so sweet and cure many diseases. In this, it is worthy of thought and reflection on the creation of Allah, the Sublime.

2.9.4. Life Styles of the Ants

The ant being one of the social insect is a very small and humble creature. In some circumstances, it may be neglected or even trampled on by people unknowingly. The ant carries its own life within its own sphere (habitation) without being molested, and makes useful contribution to the economy of the world by depositing some nutrients on the soil which increase soil fertility (Adeniyi, 2005:352). The Qur'an indicates that the ants talk to each other and communicate some messages. This is evidently shown in Surah an-Namli which states:

﴿ وَحُشِرَ لِسُلَيْمَٰنَ جُنُودُهُۥ مِنَ ٱلْجِنِّ وَٱلْإِنسِ وَٱلطَّيْرِ فَهُمْ يُوزَعُونَ
(١٧) حَتَّىٰٓ إِذَآ أَتَوْا عَلَىٰ وَادِ ٱلنَّمْلِ قَالَتْ نَمْلَةٌ يَٰٓأَيُّهَا ٱلنَّمْلُ ٱدْخُلُوا۟
مَسَٰكِنَكُمْ لَا يَحْطِمَنَّكُمْ سُلَيْمَٰنُ وَجُنُودُهُۥ وَهُمْ لَا يَشْعُرُونَ (١٨) ﴾

And gathered for Solomon were his soldiers of the Jinn and men and birds, and they were marching in rows. Until, when they came upon the valley of the ants, an ant said, "O ants, enter your dwellings that you cannot be crushed by Solomon and his soldiers while they percieves not".

(an-Namli, Q27:17-18).

The above verse indicates how the ants talked to each other. It was the leader of the ants that instructed others to rush and enter their dwelling place to avoid being crushed by Prophet Sulaiman (A.S.) and his hosts. The valley mentioned in the verse according to Mahalli (1431A.H:1093) was in Ta'if (Greater Syria). Allah enabled Prophet Sulaiman (A.S.), to miraculously understand the language of (the ants) and because of this blessing, he thanked the Almighty Allah. Prophet Sulaiman (A.S) also understood the language of other animals and insects also as stated by Ibn Arabi (n.d:1448-1449).

In the succeeding verse of the same Surah, Allah (SWT) mentions:

﴿ فَتَبَسَّمَ ضَاحِكًا مِّن قَوْلِهَا وَقَالَ رَبِّ أَوْزِعْنِيٓ أَنْ أَشْكُرَ
نِعْمَتَكَ ٱلَّتِيٓ أَنْعَمْتَ عَلَيَّ وَعَلَىٰ وَٰلِدَيَّ وَأَنْ أَعْمَلَ صَٰلِحًا
تَرْضَىٰهُ وَأَدْخِلْنِي بِرَحْمَتِكَ فِي عِبَادِكَ ٱلصَّٰلِحِينَ ﴿١٩﴾ ﴾

So (Solomon) smiled, amused at her speech and said, "My Lord, enable me to be grateful for Your favour which You have bestowed upon me and upon my parents and to do righteousness of which You approve. And admit me by

Your Mercy into (the ranks of) Your righteous servants.
(an-Namli, Q27:19)

According to the commentary of the above verse by al-Mahalli (1431A.H:1094), Prophet Sulaiman heard the voice of the ants from the distance of three miles, as her words were echoed to him by the wind. In order to save the ants, he stopped his hosts from proceeding, until the ants entered their dwellings.

The life style of ants was not known earlier to human beings. According to a research in the modern time, Naik (2001:44) explains that it has been discovered that the animals or insects whose life style closely resembles that of human beings are the ants. The following findings are the results of the said research about the ants:

(i) They exchange goods when they hold regular markets.

(ii) They hold meetings once in a while to discuss among themselves.

(iii) They bury their dead in a manner similar to human beings

(iv) They communicate among themselves through an advanced method, that is by touching and sound.

(v) They divide work among themselves, when the need arises. They select supervisors, foremen, workers, etc.

(vi) During winter, they store grains for long periods. If the grain start budding, they cut the roots so as to avoid being rottened. If the grains they store gets wet as a result of rain, they take them out into the sunlight to dry. When they are dried, they take them back inside.

Yahaya (1999:11) explains that, the population density of the ants is so high that for every seven hundred million ants that come into this world, there are only forty new born human beings. Ahmad (2010:146) mentions that, there are more than nine thousand species of ant.

The ants and plants have mutual relationship. The ants live on plants because the latter secretes some fluid that attracts the attention of the ants to come to it. Apart from the fluid and nectar they obtain from plants, they hunt for food. If the ants cannot find any food, sometimes the colony members feed on the food the young workers stored. This clearly draws

the attention of man to admit the existence of Almighty Allah Who alone can create (Adeniyi, 2005:350).

2.9.5 The Camel:

The Qur'an brought to humanity the faculty of scientific thinking. The sense of curiosity is the genesis of scientific thought. Due to the people's reflection on how the universe and nature work, they investigate and become interested in science. This curiosity as observed by Yahaya (2008:1), is that many people are not utilizing it properly. The secrets of the universe and nature are not the important things, but their own small worldly profits and pleasures. Science does not develop in communities where people think in this way, as also where idleness and ignorance rule. The Arab community before the revelation of the Qur'an was of this type (www.Islamonline.net/servlet/Satellite?c=Article&cid=1158684 39626&pacename=zone-Eng). The Qur'anic verses called upon them to think, to investigate and use their minds. The Almighty Allah draws the attention of the Arabs and other human beings to the creation of the camel, which was part of their everyday lives, where He states:

﴿ أَفَلَا يَنظُرُونَ إِلَى ٱلْإِبِلِ كَيْفَ خُلِقَتْ ﴿١٧﴾ وَإِلَى ٱلسَّمَآءِ كَيْفَ رُفِعَتْ ﴿١٨﴾
وَإِلَى ٱلْجِبَالِ كَيْفَ نُصِبَتْ ﴿١٩﴾ وَإِلَى ٱلْأَرْضِ كَيْفَ سُطِحَتْ ﴿٢٠﴾ ﴾

Then do they not look at the camels how they are created.? And at the sky how it is raised? And at the mountains how they are erected. And at the earth, how it is spread out?

(al-Ghāshiyah, Q88:17-20)

Man's attention is drawn in the above verse on the creation of four things- the camels, the sky, the mountains and the earth. His attention is drawn to think on how and why they were created. Examining the creation of Allah helps man to know the Creator better and follow His commandments. The importance of the four things mentioned cannot be overemphasized. We use camels as food and as means of transportation, the sky serves as a source of rain and many other things, the earth is meant for our habitation, and we use it to farm and do other human activities, and the mountains serve as pegs to the stability of the earth, etc.

In his commentary of the above verse, Razi (1358A.H:492) maintains that, Almighty Allah drew the attention of the Arabs and mankind to contemplate on why He created four things mentioned in Q88:17-19. These are the

camel, the sky, the mountains, and the earth. These four things are in their midst, because when they raised their eyes above them, they cast their glance at the sky. When they looked at their right and left hands, they will not see anything more than the earth. They were also very much attached to the use of camels for riding. Allah (SWT) asked them to ponder on the creation of these things especially when they were isolated. Contemplating on these things would make them to believe that they must have been created for some purpose by a Divine Being (The Creator) and believe in the message of the Glorious Qur'an.

With regard to the camel that is mentioned first out of the four things, Razi (1358A.H:492) maintains that, it is used for many purposes such as providing meat and milk for us, riding it during our journeys, and sometimes it carry our loads from one place to another. Camel is sometimes used for adornment and decoration. He states that, the sky is raised high above us without pillar, the mountains are fixed to the ground without disappearing. All these show the powerful nature of Allah. By pondering on the creation of these things,

mankind will realize that the One who created them is Wise and Knowledgeable.

The nature and blessings of the camel as expounded by Ali (1983:1728) are that the Camel can store water in his stomach for days, live on dry and thorny desert shrubs and its limbs are adapted to its life. The camel can carry men and goods, its milk is drunk, its flesh can be eaten as meat, its hair can be used in weaving. The wonderful nature of the camels according to Ibn Kathir (2003:461) despite its being powerful and strong are that, a weaker rider can guard it, because of its gentility. A young child can come to a camel and make it kneel down, stand up, and can ride it. Hundred or more camels could all be led by a young child. This shows that Allah make them to be submissive towards people and to avoid resistance.

While some domestic animals are meant for consumption and other purposes, Allah has created some harmful animals to be far away from us. He distanced them so far in order that we may not experience attacks and killings on daily basis. Animals like lion, hyenas, elephants, leopards are distanced

away from us, to save our lives. They are only kept in zoo houses for entertainment and amusement on occasional basis.

2.9.6 The Spider and its Web:

A spider is a small creature with eight thin legs. The web which is a net of thin threads is meant to catch insect for food. It is made of silken threads which are secreted by the insects glands and they have an infinitely fine calibre. In his description of the web, Bucaille (1993:207) points that, it is so fragile that it is beyond man's imitation. In addition to this, Ṭanṭáwi (1342 A.H:143) enumerate the characteristics of the web, which include being weak, delicate, and flimsy. The flimsiness in relationship to spider's house, is stressed in the Qur'an. This is shown where Almighty Allah says:

﴿ مَثَلُ ٱلَّذِينَ ٱتَّخَذُوا۟ مِن دُونِ ٱللَّهِ أَوْلِيَآءَ كَمَثَلِ
ٱلْعَنكَبُوتِ ٱتَّخَذَتْ بَيْتًا ۖ وَإِنَّ أَوْهَنَ ٱلْبُيُوتِ لَبَيْتُ ٱلْعَنكَبُوتِ ۖ
لَوْ كَانُوا۟ يَعْلَمُونَ ﴿٤١﴾ ﴾

The example of those who take allies other than Allah is like that of the spider who takes (i.e constructs) a home. And indeed, the weakest of homes is the home of the spider, if they only knew.

(al- 'Ankabut, Q29:41).

In the above verse, Allah describes the nature of the spider's house, which is very flimsy. The house according to Mahalli (1431A.H:1152) and Baghawi (1417A.H:243) does not save it from heat and cold, neither does it save it from rainfall. The Qur'an described them in this regard to be like the house of a spider which is so frail and weak. This is because by clinging to these gods, is just like a person who holds unto the spider's web. Holding unto the web of a spider does not actually benefit man. It is when a person devotes his heart to Allah and does righteous deeds that he will be rewarded accordingly.

One of the wonderful nature of the spider that attracts the attention of its observers is how it constructs its web using thread. Ṭanṭāwi (1342A.H:143) and Ahmad (2010:153-154) highlighted that, it was observed that a spider makes its web using four major threads that are thin in nature. These four major threads constitute one thousand threads which comes out specifically out of a special hole of the spider's body. From these one thousand threads, four thousands threads are produced. The production continues in manifold until it

reaches sixteen trillion threads within the shortest possible time. This indicates the powerful and majestic nature of Allah. Modern entomological studies have shown that if four billion spider threads were collected together, they would not be more than a strand of facial hair.

Ahmad (2010:153) highlights that, scientists through their study of spider's life have discovered that the web of spider has a specific geometric design that is formed precisely. This web is constructed between the branches of a tree or in a carefully chosen place in a corner. The web serves as a refuge for the spider and serve as a trap into the sticky threads of which flying insects like flies and others may fall, upon which the spider feeds. The web last only for one day after its construction.

Approximately, there are 30,000 species of spider according to entomologists. Allah (SWT) has endowed these spiders with superb abilities of construction in building their webs and spinning. (Ahmad, 2010:155).

One wonders about the creations of Almighty Allah such as the spider. In Islam, everything created is meant for a

purpose. The spider benefits man alot, because Ahmad (2010:154) indicates that they deliver millions of insects that are harmful to our health or plants. In other words, they work as a living insecticide.

2.9.7 The Cattle

The creation of cattle is among the wonderful signs of Allah to which man's attention is drawn. Allah created the Cattle and other animals for our own use, which are blessings to us. The Qur'an in Surah al-Muminun states:-

﴿ وَإِنَّ لَكُمْ فِي ٱلْأَنْعَٰمِ لَعِبْرَةً نُّسْقِيكُم مِّمَّا فِي بُطُونِهَا وَلَكُمْ فِيهَا مَنَٰفِعُ كَثِيرَةٌ وَمِنْهَا تَأْكُلُونَ ﴿٢١﴾ ﴾

And indeed, for you in livestock is a lesson. We give you drink from that which is in their bellies, and for you in them are numerous benefits, and from them you eat.

(al-Muminun, Q23:21-22).

The word "an'am" referred to in the above verse according to Al-Mahalli *et al* (1431A.H:987) means the camels, cows, and sheep. Allah has provided for us their milk to drink. We also benefit from their hair, fur and wool (that is sheep wool, camel

fur and goat hair) which are used in making clothes and shelter.

Although "an'am" is used to refer to the three categories of animals mentioned in the above paragraph, it should be understood that they are not from the same species. The nature of their shapes, sizes and usefulness also vary. To buttress this point clearly, if one compares a camel and a cow, he will realize that their meat is eaten, their milk is drunk, but when it comes to riding, it is only camel that is created to serve that purpose. The cow in most cases is not used for riding and carrying our loads, instead, it is used in the farm for ploughing.

The meat provided for us by the Creator (Allah) is not obtainable from the same source. We derive meat not only from the cattle, but from other domestic animals, such as hens, cocks, and the like. We also get fishes from the rivers. They are eaten without being slaughtered. There are some birds that we consume their meat. In some cases, we derive the meat of other animals through hunting. All these are

provided for our benefit and to enable us contemplate on the Creator and why He creates them for us.

Ṭabari (1426A.H:12-14) was of the view that, Allah the Most High mentions in Q23:21 *'And verily in the cattle, there is indeed a lesson for you'*, to mean that there is something in the cattle mankind should ponder, to understand the blessing of Allah for them as well as His power in whatever He wishes to do. Nothing stops Him from doing what He wishes to do. As regard to the second phrase of the verse which says. *'We give you to drink of that in their bellies'*, refers to the milk that comes out between the dung and blood.

Commenting on the above verse, Ibn Kathir (2003:434) elucidates that, the cattle's meat is eaten, its milk which comes between blood and dung are drunk, clothes and furnishings are made from its wool and hair, its beauty is a kind of adornment. They carry heavy burdens or loads to distant lands. All these are some of the blessings in the cattle. The cattle referred to in the verse include, cows and bull.

The production of milk in cattle as highlighted in the Qur'an is related to what the modern physiologists discovered.

The blood circulation according to Naik (2001:46-47) was described by Ibn Nafees (a Muslim scientist) 600 years after the Qur'anic revelation. William Harvey (d.1657C.E), a scientist explained also the nature of blood circulation to the western world before it knows what happens in the intestine and that organs are nourished by the process of digestive absorption. There is a verse in the Qur'an which described the sources of the milk's constituents which confirms the notion above:

﴿ وَإِنَّ لَكُمْ فِي ٱلْأَنْعَٰمِ لَعِبْرَةً نُّسْقِيكُم مِّمَّا فِي بُطُونِهِۦ مِنۢ بَيْنِ فَرْثٍ وَدَمٍ لَّبَنًا خَالِصًا سَآئِغًا لِّلشَّٰرِبِينَ ﴿٦٦﴾ ﴾

And indeed, for you in grazing livestock is a lesson. We give you drink from that which is in their bellies-between excretions and blood-pure milk, palatable to drinkers.

(an-Nahl, Q16:66).

In the above verse, Allah draws the attention of mankind to understand the fact that He produces milk from the belly of cows, that comes between their excretion and blood, but each of the products goes its own way after the full digestion of the food in its stomach. Ibn Kathir (2003:486) and Mahalli *et al*

(1431A.H:784) elucidated that, the blood goes to the vein, the milk goes to the udder, the urine goes to the bladder and the excreta goes to the anus. After they are separated, none of them gets mixed with another and none of them is affected by the other, nor is changed.

In order to understand the meaning of the above verse (Q16:66), it has to be noted that, chemical reactions occur between food and enzymes in the mouth, the stomach, and the intestines releasing nutrients in molecular form which is then absorbed into the circulatory system, then transports the nutrients to all the organs of the body among which are the milk-producing mammary glands. Naik (2001:46) further explains in simple words that, certain substances from the intestinal contents enters into the vessels of the intestinal wall itself and they are transported by the blood stream to the various organs.

Milk is a wholesome and agreeable diet for man. Its colour is so pleasing that man needs it to drink. The production of milk in cattle is very wonderful. When they are tamed and specially bred for milk, the supply of milk is vastly

greater than is necessary for their young and lasts for a longer time than during the period they suckle their young ones. The milk is a secretion like other secretions, between the excretions which the body rejects as worthless and the precious blood-stream which circulates within the body. It also serves as a symbol of life itself to the animal which produces it (Ibn Kathir, 2003:487).

Bucaille (1993:210) adds that, it is the mammary glands which secrets the constituents of milk. Through the process of food digestion, these constituents are nourished and are brought to them via the blood stream. The role of blood in this case is that, it serves as a collector and conductor of what has been extracted from food, and it brings nutrition to the mammary glands, the producers of milk, as it does to any other organ.

Adamu (2006:59) explains the importance of cow milk where he states that, it is a rich source of protein, minerals, and certain trace elements. It assists in the growth of the body and its development. It is also clinically used in the management of malnutrition, constipation, food or chemical

poisoning such as kerosene, peptic ulcer diseases, etc. This is from scientific point of view.

2.9.7.1 The Sheep

The sheep is among the quadruped animals, that is created for human beings. Their colour vary; some are white or brown, while some have mixed colours (white and black). The variation in colour is one of the things that should make man deeply think about the nature of their creation, in line with the saying of Almighty Allah:

﴿ وَفِي خَلْقِكُمْ وَمَا يَبُثُّ مِن دَآبَّةٍ ءَايَٰتٌ لِّقَوْمٍ يُوقِنُونَ ۝٤ ﴾

And in the creation of yourselves and what He disperses of moving creatures are signs for people who are certain (in) faith)

(al-Jathiyah, Q45:4)

The sheep is among the herbivorous animals that are not able to carry loads on their backs due to their smallness in size. The Qur'an states their nature of creation in this verse:

﴿ وَمِنَ ٱلْأَنْعَٰمِ حَمُولَةً وَفَرْشًا ۚ كُلُوا۟ مِمَّا رَزَقَكُمُ ٱللَّهُ وَلَا تَتَّبِعُوا۟ خُطُوَٰتِ ٱلشَّيْطَٰنِ ۚ إِنَّهُۥ لَكُمْ عَدُوٌّ مُّبِينٌ ۝١٤٢ ﴾

And of the grazing livestock are carriers (of burdens) and those (too) small. Eat of what Allah has provided for you and do not follow the footsteps of Satan. Indeed, he is to you a clear enemy

(al-An'am, Q6:142)

Al-Mahalli *et al* (1431A.H:453) stated that the animals which carry burdens include fully-grown camels. Those that are not able to carry burden, due to their being too small and near to the ground include the goats and sheep.

According to the above verse, the animals that carry burden are those that people ride. On the other hand, the meaning of '*Farsh*' according to the above verse is that they eat its meat and milk it. The sheep is not able to carry things, but its usefulness is that people eat its meat and utilize its wool for covers and mats. The skins of these animals (sheep) are also used in making shoes and other useful things.

2.9.8 The Birds

Like human beings, animals and birds also live in communities. The Qur'an frequently mentions about birds. In the life of some Prophets such as Ibrahim, Isah, Dawud,

Sulaiman, and Yusuf (A.S) birds appear in episodes (Bucaille, 1993:207).

According to B.S.L. (2008:28), there are 30,000 known varieties of birds, divided into some 8600 to 8900 species. More than 800 species of these birds are found in North of Mexico in North America.

The Glorious Qur'an in many verses draw the attention of man to ponder on the creation of birds-how they fly in the sky between heaven and earth and how Allah caused them to fly with their wings. It is Almighty Allah who gives them the power to do so. In doing so, He subjects the air to carry them.

In Surah al-Mulk the Qur'an states:-

﴿ أَوَلَمْ يَرَوْا إِلَى ٱلطَّيْرِ فَوْقَهُمْ صَٰٓفَّٰتٍ وَيَقْبِضْنَ ۚ مَا يُمْسِكُهُنَّ إِلَّا ٱلرَّحْمَٰنُ ۚ إِنَّهُۥ بِكُلِّ شَىْءٍۭ بَصِيرٌ ﴿١٩﴾ ﴾

Do they not see the birds above them with wings outspread and (some times) folded in? None holds them (aloft)except the Most Merciful. Indeed He is of all things seeing.
(al-Mulk, Q67:19).

As indicated in the verse above, the Qur'an shows that Allah is the One Who has given birds the strength to fly with

their wings in the sky. Elucidating on this point, Ibn Kathir (2003:91) and Ali (1983:1580) maintained that, the upward and downward motions of the birds, their stabilization in the air, and when they rest on their feet are signs on the power of Allah. This shows that, the Creator knows the movement and existence of everything that He created.

According to the commentary given on the above verse (Q67:19), Al-Mahalli *et al* (1431A.H:1616) expounded that, Allah (SWT) the Creator of (birds) causes them to spread out their wings in the air and sometimes they flap by gathering their wings and then spreading them out. Allah (SWT) further indicates that, nobody cause the birds to do so, except Him. He is the only One Who upholds them and save them from falling to the ground.

It should be understood that the flight of the birds is by the power of Allah and it is a lesson for human beings to know that whatever Allah (SWT) creates, on the land and seas, whether small or big, Allah (SWT) sees and provides means of sustenance to them. Almighty Allah is also the One who

subjected the air for the birds to fly, for without it, their movement in the sky will be very difficult.

Furthermore, Bucaille (1993:208) and Naik (2001:40) in their attempt to interpret the meaning of Q67:19 quoted above, discuss about birds and their creative nature where they stated that, the behaviour of birds is attributed to the Divine order. With regard to the programming of their movements, modern scientific data has explained the degree of perfection attained by certain species of birds. In the genetic code of birds, it is only the existence of a migratory programme that explains the difficult and long journey that very young inexperienced birds which are not being guided are able to accomplish. These birds are able to return to the departure point on a fixed period.

To examplify the journey undertaken by birds, Naik (2001:40) points that Professor Hamburger in his book, *'Power and Fragility'* indicates that the 'mutton-bird' which lives in the pacific undertakes 15,000 miles journey in the shape of figure 8. In this journey, over six months is spent before it finally comes back to its departure point, with at least a delay

of one week. Without doubt, the highly complicated instructions for the journey of this kind according to Bucaille (1993:209) have to be contained in the nervous cells of the birds. This is definitely programmed by the most knowledgeable Programmer (Almighty Allah).

The creation of birds is meant for many purposes. In other words, the birds are created to help man beautify his environment. The peacock, quetzal and the birds of paradise are examples of beautiful birds created by Allah. They are provided with feathers of splendid colours. Every species of birds has its own colour and pattern of feather. These feathers according to B.S L. (2008:3) are sometimes replaced, when they are removed, just like how human beings remove their clothes. The birds molt their feather at least once a year.

Explaining the uses of birds to man, B.S.L. (2008:14) indicates that, the wild birds in their constant search for food eat huge number of insects, weeds, seeds and rodents. The amount of orchards that farmers can harvest are sometimes cut down by insects, weeds and rodents. The cost of fighting these pests without the assistance of birds would have made

some food more costly to produce. Another role of birds is that, they help in destroying weed seeds and in scattering seeds to barren areas. This clearly shows that they serve as agents of pollination. Other uses of birds are that they are consumed as food and serve the purpose of sporting activities. For example, domestic birds-such as chickens, turkeys, ducks, and geese raised by farmers-provide man with meat and eggs. Game birds such as grouse, peasants, wild ducks and geese provide sport for hunters.

2.9.8.1 *Communication Among the Birds*

Communication between birds and ants is given special consideration in the Qur'an. This fact leads the enquirers to study other animals. It is a reality that the birds communicate with each other. The evidence of this can be seen in the Qur'an where the Almighty Allah says:

﴿ وَوَرِثَ سُلَيْمَٰنُ دَاوُۥدَ ۖ وَقَالَ يَٰٓأَيُّهَا ٱلنَّاسُ عُلِّمْنَا مَنطِقَ ٱلطَّيْرِ وَأُوتِينَا مِن كُلِّ شَىْءٍ ۖ إِنَّ هَٰذَا لَهُوَ ٱلْفَضْلُ ٱلْمُبِينُ ﴿١٦﴾ ﴾

And Solomon inherited David. He said, "O people, we have been taught the language of birds we have been given from all things. Indeed, this is evident bounty.

(an-Namli, Q27:16).

This verse teaches mankind that Prophet Sulaiman (A.S.) was given the knowledge of understanding the speech of birds and beasts. In addition to these, he was made to be a king, who led people, jinns and other animals, and was given prosperous wealth.

No man can doubt about communication among the birds especially if he observes their movement and migratory nature (B.S.L,2007:15). The nature of communication among the birds which is an undeniable fact is not as developed as it is in man. The Qur'an informs mankind that animals communicate to each other. Scientists have also explained the same thing. This clearly shows that there is compatibility between modern science and Qur'an.

A research was conducted on birds by American and Brazilian ornithologists, who have studied the humming bird (one of the tiniest birds in the world) and published their findings in British Journal of Nature. Maria Louisa, the author of the article says that, the humming bird's vocabulary is not innate, but it develops afterward. In other words, humming bird learns to speak as human beings do.

(www.articlebase.com/religion-articles/miracle-ofqur'an-communication- between-birds).

Through the studies of crows as noted by B.S.L. (2008:7), it has been established that they emit a variety of sounds such as to express alarm, to call the colony of crows to come together, and to inform others a state of difficulty. Their sounds were recorded by ornithologists using a sonograph. They are still engaged in deciphering the meanings behind them. Among these scientists, Bernd Heinrich spoke of the difficult nature of decoding the sonograms. He associated this research work with the work of the inhabitants of other planets visiting the earth and trying to decipher eating, playing, making love, and activities like catching fish using a sonograph. He also speaks of the difficulty faced in perceiving the language of animals in general, as different species have different ways of communication, each calling for a different approach.

The birds have in general a body language, although the sounds they emitted are a means of communication. Their body language is easier to decipher. For example, a bird that

emits a sound by touching its beak with its tongue means" I am a friend, I have no intention of harming you" (www.Qur'anmiracles.com/articles.asp?id=16). This body language of the birds is also found among human beings. The changes in one's body, position, and movement which show what one is feeling or thinking is a body language. For instance, hailing is a sign of calling to someone in order to attract his attention or greet him, nodding is a sign of "yes" etc.

As expounded by B.S.L. (2008:7), the birds sing for two purposes. A male bird perch on some prominent places such as a weed top, branch of a tree, or other places and sing lustily to inform other males of the same species that a certain territory belongs to it. In courtship, singing is also used to call the attention of the female to the male's charms. The basic pattern of song is inherited. The younger birds learn from the parents and other adult birds in detail. Birds communicate with one another by using variety of call notes. They call in order to eat food, let their mates and young ones know where

they are, calls to keep the flock together during migration, and when in danger.

2.10 *Life Science in the Prophetic Period:*

The Prophet (S.A.W) used the Glorious Qur'an to guide Muslims in all aspects of their life. He guided the Companions on what Allah (SWT) created, such as issues related to plants and animals, because Allah Who created us has the full knowledge of what He created.

In line with the teachings of the Qur'anic verses such as the following, the Prophet (S.A.W) encouraged the Muslims to study all aspects of science which do not contradict the general teachings of Islam:

﴿ إِنَّ فِي خَلْقِ ٱلسَّمَٰوَٰتِ وَٱلْأَرْضِ وَٱخْتِلَٰفِ ٱلَّيْلِ وَٱلنَّهَارِ
لَءَايَٰتٍ لِّأُو۟لِى ٱلْأَلْبَٰبِ ﴿١٩٠﴾ ٱلَّذِينَ يَذْكُرُونَ ٱللَّهَ قِيَٰمًا وَقُعُودًا
وَعَلَىٰ جُنُوبِهِمْ وَيَتَفَكَّرُونَ فِي خَلْقِ ٱلسَّمَٰوَٰتِ وَٱلْأَرْضِ رَبَّنَا
مَا خَلَقْتَ هَٰذَا بَٰطِلًا سُبْحَٰنَكَ فَقِنَا عَذَابَ ٱلنَّارِ ﴿١٩١﴾ ﴾

Indeed, in the creation of the heavens and the earth and the alternation of the night and the day are signs for those of understanding. Who remember Allah while standing or sitting or (lying) on their sides and give thought to the creation of the

heavens and the earth, (saying) "Our Lord, You did not create this aimlessly. Exalted are You (above such a thing), then protect us from the punishment of the fire.

(Ali-Imran, Q3:190-191)

The above verses call on humanity to use their senses so as to perceive the beauty and balance in our own nature. Man is called upon by Almighty Allah to understand the nature of creations and the reasons why they are created. Things are created for no other purpose but the use of man, to enable him realize the existence of Allah and serve Him (the Creator). In the same vein, Allah states in another verse:

﴿ إِنَّ فِي خَلْقِ ٱلسَّمَٰوَٰتِ وَٱلْأَرْضِ وَٱخْتِلَٰفِ ٱلَّيْلِ وَٱلنَّهَارِ وَٱلْفُلْكِ ٱلَّتِي تَجْرِي فِي ٱلْبَحْرِ بِمَا يَنفَعُ ٱلنَّاسَ وَمَآ أَنزَلَ ٱللَّهُ مِنَ ٱلسَّمَآءِ مِن مَّآءٍ فَأَحْيَا بِهِ ٱلْأَرْضَ بَعْدَ مَوْتِهَا وَبَثَّ فِيهَا مِن كُلِّ دَآبَّةٍ وَتَصْرِيفِ ٱلرِّيَٰحِ وَٱلسَّحَابِ ٱلْمُسَخَّرِ بَيْنَ ٱلسَّمَآءِ وَٱلْأَرْضِ لَءَايَٰتٍ لِّقَوْمٍ يَعْقِلُونَ ﴿١٦٤﴾ ﴾

Indeed, in the creation of the heavens and the earth and the alternation of the night and the day, and the (great) ships which sail through the sea with that which benefits people, and what Allah has sent down from the heavens of rain, giving life therefore to the earth after its life lessness and dispersing therein every (kind of) moving creature

and (His) directing of the winds and the clouds controlled between the heaven and the earth are signs for people who use reason.

(al-Baqarah, Q2:164)

A vivid explanation is made in the above verse, on rain, Allah sends down from the sky which leads to the growth of plants. The various moving creatures on earth and the change of course by winds and cloud have also been created for man's benefit. In the creation of all these natural phenomena, there exists a perfect balance.

In a Hadith, the Prophet (SAW) was reported to have said:

"ما من مسلم يغرس غرسا إلا كان ما أكل منه له صدقة وما سرق منه له صدقة وما أكل السبع منه فهو له صدقة وما أكلت الطير فهو له صدقة ولا يرزؤه أحد إلا كان له صدقة" (رواه مسلم).

Never a Muslim plants a tree, but he has the reward of charity for him, for what is eaten out of that is charity, what is stolen out of that, what the beasts eat out of that is charity for him. In short, none incurs a loss to him but it becomes a charity on his part. (Muslim, Vol.5, Hadith 3764)

The above Hadith encourages Muslims to plant trees that bear fruits or those that provide shades, wood, medicine and fruits. Planting trees help to protect us against desert

encroachment. Doing this attracts enormous reward even after the death of an individual. In fact, it is counted and regarded as Sadaqah Jāriyah (recurring charity). Muslims are also encouraged by the Prophet (SAW) to practice agricultural activities and other things related to Life science such as botanical and some Zoological studies and practices.

The verses of the Qur'an and Hadith quoted above (and other related ones) were the basis upon which Muslims right from the period of the Prophet (SAW) explored the Life science, Agricultural science, Horticulture and the like. Muslims right from that time according to Ali (1977) started producing food, fruit, flowers, etc. on small scale basis and they sent these items to various parts of the world for commercial purposes. They also involved themselves in the study and rearing of animals like camels and cows. All these were consequent upon the teachings of the Qur'an and Prophetic Ahādith.

Apart from the encouragement given to the Companions (R.A) by the Messenger of Allah (S.A.W) on planting trees and crops, the former were guided on how to use land. After the establishment of Muslim community at Madina, the Ansar

(helpers) assisted and shared their properties with the Muhājirun (Muslim immigrants from Makkah). The Muslims who did not acquire land to cultivate were allowed to either hire or cultivate it and the yield was shared between them and the owners of the land based on some agreement. This practice was called Mukhābarah in Arabic. In this regard, Siddiq (1971:816) explains that, in some areas the land owners and cultivators used to reach agreement, in which they shared half of whatever was cultivated in the farm land. In some areas, it was one third and two third ratio that was agreed upon. The seeds were supplied in some cases by the land owners, and in some areas, it was the tenants who acquired it.

In some cases, the Madinan Muslims divided and gave their lands to Makkan Muslims on the condition that the former would give half of the fruits from the orchards annually and the immigrants would recompense them by participating in farm work. At a later time, the immigrants possessed lands and other properties through purchases, booty and reviving the dead lands. The Prophet (S.A.W) also allowed the Jews to

continue the cultivation of some lands as a matter of expediency (Siddiq, 1971:818).

The Prophet (S.A.W) prohibited his Companions from cutting down trees, except for strong and legitimate reasons, pointing that doing so is against the bounties of the Almighty Allah and it diminishes the beauty of the environment He has created.

Lawal (2007:93) in his contribution to this field highlights that, after the migration of Muslims from Makkah to Madinah, the Prophet (S.A.W) organized the planting of trees and date groves. This clearly shows that the tree planting campaigns organized at local, state, or federal government levels in Nigeria is not a new thing in Islam. The Prophet (S.A.W) also established conservation areas by using forest and green spaces where every sort of living creature lived. These were called hima (sanctuaries). Around Madinah for instance, a strip of land that was approximately twelve miles wide was proclaimed a sanctuary and conservation area. Other areas similar to these were also proclaimed by the Prophet (S.A.W).

2.10.1 Teachings of the Prophet (S.A.W) on Animals:

The Prophet (S.A.W) commanded his Companions to do good to all living creatures, animals inclusive. He enjoined that, animals should be treated well by giving them their needs, such as food and medicine and by slaughtering them after sharpening the knife to minimize their pain. Lawal (2007:97) also points out that the Messenger of Allah (S.A.W) prohibited the killing of animals and birds without genuine reason. Islam categorically prohibits wastage of animals in peace or war time.

In Islamic civilization, the life of all creatures is considered an important thing in the sight of Allah. This is the reason why Islam prohibits the Muslims to force animals to carry some loads beyond their capacity. Doing this is tantamount to committing sin which will be accounted for in the hereafter.

Fazlulkarim (1938:327) explains some issues on the treatment of animals. According to him, the natural wants of animals should be supplied by those who are taking care of them. After the return of the Prophet from Mi'raj (nocturnal

journey) from the heaven, he narrated that he saw a woman receiving punishment in the hell on account of confining a cat and refusing to give it food and drink, until it died of hunger. On the other hand, the sin of another woman among the Israelites was forgiven by Almighty Allah as a result of giving water to a thirsty dog. Islam frowns against ill-treatment of animals as they are creatures of Allah. The Qur'an speaks in this regard saying:

﴿ أَلَمْ تَرَ أَنَّ ٱللَّهَ يُسَبِّحُ لَهُۥ مَن فِى ٱلسَّمَٰوَٰتِ وَٱلْأَرْضِ
وَٱلطَّيْرُ صَٰٓفَّٰتٍ ۖ كُلٌّ قَدْ عَلِمَ صَلَاتَهُۥ وَتَسْبِيحَهُۥ ۗ وَٱللَّهُ عَلِيمٌۢ بِمَا
يَفْعَلُونَ ﴿٤١﴾ ﴾

Do you not see that Allah is exalted by whomever is within the heavens and the earth (by) the birds with wings spread (in flight)? Each (of them) has know his means of prayer and exalting (Him), and Allah is knowing of what they do.

(an-Nur, Q24:41).

All the inhabitants of the heavens and earth, living and non-living things, animate and inanimate things are creatures of Allah and therefore according to the above verse, have their own mode of praising the Almighty Allah, which may not necessarily be oral. The mode of praise is only known to Allah.

The Prophet (SAW) encouraged the Companions and indeed all Muslims to have sympathy for their animals as indicated in the following Hadith:

> "إن الله كتب الإحسان على كل شيء، فإذا قتلتم فأحسنوا القتلة، وإذا ذبحتم فأحسنوا الذبحة، وليحد أحدكم شفرته وليرح ذبيحته" (رواه مسلم).
> *Verily, the Almighty Allah inscribed kindness on everything. So when you slaughter, make your slaughter good, when you sacrifice, make your sacrifice good. Let everybody sharpen his knife and give ease to the sacrificed animal.* (Muslim, vol.3, Hadith 4810)

It is pointed in the above Hadith that Muslims should slaughter their animals after sharpening their knives, so as to avoid making them suffer. To slaughter an animal in front of another animal is prohibited, as doing so may cause distress to the latter.

Lawal (2007:98) elucidates that the Prophet (S.A.W) taught his Companions to treat their animals well, protect them when in need, and that they should not abuse or degrade them.

According to the Prophet (SAW), Muslims should not over-burden any animal with any work such as intense

ploughing, carrying heavy luggages, that it cannot bear. Any work to be done by the animals should suit their nature.

2.11 Reproduction in the Plant Kingdom

Like animals, plants also reproduce, according to how Almighty Allah ordains them to do. The Qur'an since the seventh century C.E, before the birth of modern botany mentioned that plants like human beings are created in pairs. This fact can be seen in Surah adh-Dhāriyat where Allah states:

﴿ وَمِن كُلِّ شَيْءٍ خَلَقْنَا زَوْجَيْنِ لَعَلَّكُمْ تَذَكَّرُونَ ﴿٤٩﴾ ﴾

And of all things We created two mates (i.e counterparts), perhaps you will remember.

(adh-Dhariyat, Q51:49).

The above verse clearly indicates that, Allah (the Creator) created things in pairs. It reveals the mystery of sex through creation among animals, plants, and other things that we may not have known. Human beings for instance, are either males or females. It is only in few cases that we may have the hermaphrodites among us. This also applies to the plant kingdom as indicated by Ṭanṭáwi (1342 A.H:75)

In his explanation on pairs in creation, Ali (1983:1178) has shown that in nature, there are pairs of opposite forces. In electricity for example, the atoms have positively charged neutrons surrounded by negatively charged protons.

In our daily living, we also find out that things have their related opposites. For instance, when we mention new, then old is its opposite. Other things that can serve as examples include day and night, black and white, beauty and ugly, kind and unkind, wealth and poverty, hungry and satisfaction, good and bad, health and sickness etc. This is the reason why the Creator (Allah) mentioned in the above verse that in everything He has created pairs, so that mankind can contemplate on the wonderful nature of Allah and have fear in Him.

Al-Mahalli *et al* (1431A.H:1493) gives further explanation of *'And of everything We have created pairs'* as shown in Q51:49 above, by mentioning other things Allah (SWT) created in pairs, such as the heaven and earth, sun and moon, land and seas, faith and disbelief, death and life, wretchedness and happiness, paradise and hell. They also mentioned that this

issue of creating things in pairs is applied to the animals and plants, so that mankind may know that the Creator of these pairs is One and that they should worship Him alone.

The fact mentioned in Q51:49 above according to Naik (2001:53) are confirmed by the botanists of modern time that, plants have male and female genders, even the unisexuals. This issue is further proven by another Qur'anic verse which says:

﴿ ٱلَّذِى جَعَلَ لَكُمُ ٱلْأَرْضَ مَهْدًا وَسَلَكَ لَكُمْ فِيهَا سُبُلًا وَأَنزَلَ
مِنَ ٱلسَّمَآءِ مَآءً فَأَخْرَجْنَا بِهِۦٓ أَزْوَٰجًا مِّن نَّبَاتٍ شَتَّىٰ ﴿٥٣﴾ ﴾

(It is He) Who has made for you the earth as a bed (spread out) and inserted therein for you road ways and sent down from the sky, rain and produced thereby categories of various plants.

(TáHa, Q20:53).

As indicated in the above verse, Allah sends down water from the sky to enable the growth of plants. The importance of plants (as explained before) to man and animals cannot be over emphasized. They are used for the consumption of man and other creatures, especially cattle. It is also pointed in the

above verse that Allah created plants in pairs (of males and females).

In his explanation on reproduction in plants, Bucaille (1993:202) buttresses that, fruit are the end products of reproduction process in plants. The flower stage which is a stage preceding fruit has male and female sexual organs called stamens and ovules. Once pollen has been carried to ovules, it bear fruits which matures in turn and frees its seeds. It should be borne in mind that, as for some species in plants, fruit can come from non-fertilized flowers (parthenocarpic fruit), such as banana, fig, orange, pineapple and vine. All these have some definite sexual characteristics. The creation of variety of flowers and fruits as explained by Ṭanṭáwi (1342:34 A.H) which produce different smells that are pleasing to us, is one of the great and wonderful nature of Allah.

Ibn Kathir (2003:350-351) elucidates the meaning of Q20:53 above by stating that, Almighty Allah creates various species of plants such as fruits and vegetation. These fruits have different tastes; some are sweet, some are bitter and some are sour, and there are other kinds as well.

2.11.1 Pollination and its Classification

In order to properly understand how sex takes place in plants, there is need to reflect on what the Qur'an says in Surah al-Hijr which says:

﴿ وَأَرْسَلْنَا ٱلرِّيَٰحَ لَوَٰقِحَ فَأَنزَلْنَا مِنَ ٱلسَّمَآءِ مَآءً فَأَسْقَيْنَٰكُمُوهُ وَمَآ أَنتُمْ لَهُۥ بِخَٰزِنِينَ ﴿٢٢﴾ ﴾

And We have sent the fertilizing winds and sent down water from the sky and given you drink from it. And you are not its retainers (al-Hijr, Q15:22)

Almighty Allah mentions the importance of wind in the above verse. Ibn Kathir (2003:388-389) buttresses that the wind fertilizes the clouds, so that they give rain. It also fertilizes trees, so that they open their blossoms and leaves. Allah (SWT) mentions winds in the above verse in plural form, because they give results, unlike the wind mentioned in surah Adh-Dhāriyat (Q51:41), i.e Ar-Rih, Al-Aqim (the barren wind) that is mentioned in singular form. The reason behind this is that it does not produce anything, as results can only be produced when there are two or more things.

According to Abdullah bn Mas'ud (d.32AH), the wind is sent bearing water from the sky, then it fertilizes the clouds until rain begins to fall generously, just like the milk of the pregnant camel flows generously. This is the view upheld by Abdullah bn Abbas (d.68A,H), Ibrahim an-Nakha'i (d.97A.H) and Qatādah (d.117A.H). According to a different view upheld by Ad-Dahhak (d.212A.H), Allah (SWT) sends the winds, the clouds gets fertilized and becomes full of water. On the other hand, Ubayd bn Yamayr al-Laythi (d.74A.H) said: Allah (SWT) sends the wind which stirs up the earth, then He sends it to raise the cloud and send another wind to form the cloud and then sends the fertilizing wind which pollinates the trees.

The above views upheld by commentators of the Qur'an clearly convey that Allah (SWT) sends the wind to play so many roles at different stages before the rain fall. The function of the winds is vey important to human beings, as it leads to the stage of having rainfall.

A description is made in the above verse concerning the roles played by the wind. The wind serves as a pollinating agent. Pollination according to Soliman (1985:84) refers to a

process in which pollen is being carried from a male organ (stamen) into a female organ (pistil). There are two types of pollination:

1. Self pollination: It is the pollination in which some plants pollinate themselves by themselves.
2. Cross-pollination refers to a situation in which the pollen of one flower pollinates the stigma of another flower.

As for the pollination of plants, modern science has established that, there are two types of fruits (male and female). It also states that there are three types of plant flowers including male flowers, female flowers and self-fertilizing flowers. Withregard to fruits, the Qur'an in Surah ar-Ra'ad states:

﴿ وَهُوَ ٱلَّذِى مَدَّ ٱلْأَرْضَ وَجَعَلَ فِيهَا رَوَٰسِىَ وَأَنْهَٰرًا ۖ وَمِن كُلِّ ٱلثَّمَرَٰتِ جَعَلَ فِيهَا زَوْجَيْنِ ٱثْنَيْنِ ۖ يُغْشِى ٱلَّيْلَ ٱلنَّهَارَ ۚ إِنَّ فِى ذَٰلِكَ لَءَايَٰتٍ لِّقَوْمٍ يَتَفَكَّرُونَ ﴿٣﴾ ﴾

And it is He who spread the earth and placed therein firmly set mountains and rivers; and from all of the fruits He made therein two mates; He causes the night to cover the day. Indeed in that are signs for a people who give thought.

(ar-Ra'ad, Q13:3).

The above verse conveys an idea of sex in the plant kingdom. In other words, plants are created in pairs of either male or female with an apparatus of a sexual reproduction (ie stamens for the male plants and pistils for the female plants). Ali (1983:603) points that, some flowers combine both stamens and pistils and in some cases the organs are specialised in separate flowers, and in some cases in separate trees. He gives two examples of plants (date-palm of Arabia and papaya of India) which are among the trees that are unisexual. The verse also tells us that fruits come from plants that have unisexual characteristics even when they come from nonfertilized flower like bananas.

The agents of pollination according to Soliman (1985:84) include the winds and insects as being the most important. Water and other animals, like birds and man also contribute in matters of pollination, but are of lesser important when compared with the wind and insects. Tukur (2010:12) elucidates that, the so called agents of pollination help in facilitating the process of pollination. 80% of the flowering plants are pollinated by animals and wind and water pollinate

the remaining 20%. The wind also contributes alot in the dispersal of plants.

It should be understood that the Qur'an in Surah al-Hijr (15:22) mentions the function of the wind, among which is that it serves as an agent of pollination.

Imam Muslim (d. 261 A.H) recorded a hadith narrated by Musa Ibn Ṭalha on the authority of his father who said:

مررت مع رسول الله صلى الله عليه وسلم بقوم على رءوس النحل فقال: "ما يصنع هؤلاء"؟ فقالوا: يلحقونه يجعلون الذكر في الأنثى فيلقح. فقال رسول الله صلى الله عليه وسلم: "ما ظن يغني ذالك شيئا". قال فأخبوا بذالك فتركوه فأخبر رسول الله صلى الله عليه وسلم بذالك فقال: "إن كان ينفعهم ذالك فليصنعوه فإني إنما ظننت ظنا فلا تؤاخذوني بالظن ولكن إذا حدثتكم عن الله شيئا فخذوا به فإني لن أكذب على الله عز وجل" (رواه مسلم).

I was with the Prophet (S.A.W) when he passed by some people who had climbed up to the top of some date palms. The Prophet (S.A.W) enquired as to what they were doing. He was told that they were pollinating trees in order to fertilize them by touching the male to the female. The Prophet (S.A.W) said: "I don't think this will benefit them". When people learnt of the Prophet's comment, they stopped the practice of pollination. The yield however was very low that year. When the Prophet (S.A.W) came to know of this, he said "if they benefit from pollination, they should continue with this practice. Do not hold me at fault on account of a guess. If on the other hand I said anything about Allah, it must be adhered to because I never say anything untrue when I am speaking of Allah.

(Muslim, vol. 7 Hadith, 5830)

The above hadith categorically separates religious affairs from scientific research. While the former must be followed strictly according to Divine guidance, the latter depends on human experience, which is subject to some changes depending on the need and prevailing circumstances. It also indicates that scientific ideas are well known and encouraged right from the beginning of Islam.

2.11.2 Plants and their Importance

Plants are found throughout the world, whether on land, in water or even floating in the air. Plants can be found wherever there is air, soil and sunlight. According to B.S.L (2008:1), the botanists have named and described approximately 270,000 different types of plants. There are also some unidentified plant species that exist in less explored ecosystems like tropical forest. There are numerous uses of plants which are identified as follows by B.S.L (2008:1-3):

1. Plants are used by human beings directly or indirectly as a source of food. Food, whether protein, starch, vitamins, carbohydrates and the like are consumed by man.

2. Plants are used for clothing purposes. Cotton, synthetic fibres, linen and dyestuff are used for making clothes and colouring them. Human beings cannot live without wearing clothes to cover private parts, protect themselves from cold and heat of the sun, etc.
3. The source and origin of papers that we use for writing purposes come from plants. More than 4500 years ago, the first paper was prepared by the ancient Egyptians from the fibrous stems of papyrus; a plant that is grass like in nature. The name of paper was derived from papyrus.
4. In the field of health, plants become useful in that some of them are used in curing diseases. Some plants relieve aches and pains when people are sick. For example, periwinkle plant is proved effective in the treatment of children's disease called leukemia. Vincristine was the medicine discovered and derived from the periwinkle plant. Plants are important in the growth of man and many of them are invaluable sources of vitamins according to the discovery of the 20th century.

5. Plants and algae provide most of the energy consumed in ecosystems. All organisms would run out of food without the plants. Minerals such as nitrogen, potassium, and phosphorus are absorbed by plants from the soil. These minerals are stored in the tissues of plants and are essential part of the diet of animals that eat plant. The fertility of the soil is increased by the leaves and some decayed plants.
6. In matters related to cooking and heating, plants are very useful. The most important fuel for instance are coal, gas, and oil which originated from green plants that existed for long time on earth. These green plants are converted by compression and heat to fossil fuel.
7. Plants are also useful in making shelter and other products that we use in our houses. The wood that originates from plants provides shelter in many parts of the world. The wood is used in making furniture such as chairs, cushions, center and dinning tables, beds, cupboards, to mention but few.

The Glorious Qur'an mentions alot of scientific facts that were not properly understood during its revelation, until at the present time. For more than 1000 years before the birth of modern science, particularly Botany, Allah has drawn the attention of man to examine how He created plants and fruits where He says:

﴿ هُوَ ٱلَّذِىٓ أَنزَلَ مِنَ ٱلسَّمَآءِ مَآءً لَّكُم مِّنْهُ شَرَابٌ وَمِنْهُ شَجَرٌ فِيهِ تُسِيمُونَ ﴿١٠﴾ ﴾

It is He Who sends down rain from the sky; from it is drink, from it is foliage in which you pasture (animals). (an-Nahl, Q16:10).

According to Zamakshari (1385A.H:338), Allah (SWT) mentions the conditions of plants as He did so regarding the creation of animals, so as to show His complete power. The water send down from the sky is the main source of all other water we use, be them wells, springs, rivers, sea water and the like. To buttress this point clearly, he cited a verse of the Glorious Qur'an which states:

﴿ أَلَمْ تَرَ أَنَّ ٱللَّهَ أَنزَلَ مِنَ ٱلسَّمَآءِ مَآءً فَسَلَكَهُۥ يَنَٰبِيعَ فِى ٱلْأَرْضِ ثُمَّ يُخْرِجُ بِهِۦ زَرْعًا مُّخْتَلِفًا أَلْوَٰنُهُۥ ثُمَّ يَهِيجُ فَتَرَىٰهُ

مُصۡفَرّٗا ثُمَّ يَجۡعَلُهُۥ حُطَٰمًاۚ إِنَّ فِي ذَٰلِكَ لَذِكۡرَىٰ لِأُوْلِي
ٱلۡأَلۡبَٰبِ ﴿٢١﴾

Do you not see that Allah sends down rain from the sky and makes it flow as springs (and rivers) in the earth; then He produces thereby crops of varying colors; then they dry and you see them turned yellow. Then He makes them (scattered) debris. Indeed in that is a reminder for those of understanding.

(az-Zumar, Q39:21)

Zamakhshari (1385 A.H:461) has given example of some commentators of Qur'an such as az-Zujjaj who commented on Q16:10, to explain the nature of plants creation. According to the latter, anything that grows from the earth, which stands on its trunk is called "shajar" (trees) whether it is planted or naturally grows. On the other hand, any thing that grows and spread on earth is called "najm" (herbs). Qutaybah (d.240AH) defines shajar as contained in the same verse (Q16:10) to mean a place where animals pasture. In another version, says Zamakhshari (1385 A.H:461), anything that has trunk is called "shajar", in line with the saying of Allah in the following verse:

﴿ وَٱلنَّجْمُ وَٱلشَّجَرُ يَسْجُدَانِ ۝٦ ﴾

And the stars and trees prostrate.
(ar-rahman, Q55:6)

The above verse indicates that plants are classified into two. There are some that have trunk and are called trees and there are some that spread, covering the ground (herbs). These plants as indicated in the verse both submit themselves in obedience to Almighty Allah who created them.

Zamakhshari further commented on the importance of shajar (vegetation) which is used for pasturing our cattle (such as sheep, cow and the like). He pointed that Allah is the One Who causes the growth of vegetation and other crops and fruits by sending rain water. Examples of fruits familiar to the Arabs such as olives, grapes, date palms are also mentioned in the verse to draw their attention to understand the power of Allah who provided the fruits for their benefits.

The above verse also tells us that, rain is sent down by Almighty Allah and it is the basic thing that causes the growth of our vegetation, which refers to plant in general. The creation of variety of plants on earth is to serve many purposes (as

explained before) and to help man to develop high thoughts on why they are created.

Scientists in the field of Botany have classified plants according to three ways: Classification by the nature of their growth, length and pattern of their life, and their structure. These need brief elaboration.

According to Encyclopaedia Britannica (2008:5), plants are classified according to the nature of their growth. Some plants are called trees if they have tall woody stems or trunks and are 8 feet (2.4 meters) or more in heights. Some are called shrubs (low woody plants) with many stems branching off close to the ground. The third category under this class are the herbs, which have tender and juicy stems with less developed woody tissue than it is in shrubs and trees. There are many varieties of plants within each of these groups.

Based on the length and life cycles pattern, flowering plants are categorized into three according to Ramalingam (1993:62) and B.S.L. (2008:5). There are some which complete their life cycle within a single year. Their seeds germinate and develop into flowering plants, then new seeds are produced

and then parent plant dies, all within one growing season, such as garden flowers. There are some plants that require two years to complete their life cycle (biennials). They produce stems and leaves in the first year and in the second year, they produce blossom and seeds and then die. Garden flowers like hollyhocks, foxgloves, canterbury bells are examples of biennial plants. The third class of plants on the basis of life cycle are called perennial plants. They live for more than two years. Wild flowers, common garden perennials such as irises, peonies, etc were developed from wild species.

The Qur'an in numerous places speaks of how Almighty Allah creates fruits, grains and plants. If a man sows a single seed of maize, guinea corn, millet and the like, it is buried in the soil for some days before it starts germinating. After its germination, it continues growing until it forms a stalk and later on so many seeds/fruits are produced during the time of harvest through the only one seed sown intitially. In this regard, Allah asks this question to people where He says:

﴿ أَفَرَءَيْتُم مَّا تَحْرُثُونَ ﴿٦٣﴾ ءَأَنتُمْ تَزْرَعُونَهُۥٓ أَمْ نَحْنُ ٱلزَّٰرِعُونَ ﴿٦٤﴾ لَوْ نَشَآءُ لَجَعَلْنَٰهُ حُطَٰمًا فَظَلْتُمْ تَفَكَّهُونَ ﴿٦٥﴾ ﴾

And have you seen that (seed) which you sow? Is it you who makes it grow, or are We the grower? If We willed, We could make it (dry) debris, and you would remain in wonder.

(al-Waq'iah, Q56: 63-65)

In the above verses, Allah appeals to the external nature around us, which serves as an evidence that He loves us and has great care for us. This is because the essence of making the seeds to grow is to enable us have enough food for our consumption.

Another wonderful nature of Allah on plant creation is that some of them grow naturally without being sown by anybody. Some varied as regard to their colour, size, shape, taste, etc, as stated before (Ibn Kathir, 2003:442-443). The Almighty Allah is the only One Who determines the colour, size, shape, taste and other things regarding the creation of plants by using the same water for their growth. (Bucaille, 1993:199-201)

At times part of a tree is cut off and joined with another tree and it continues growing, when the fruits are riped, the species are distinguished. This process (of marrying one variety of tree with another) is the same as what the botanists refer to as an outgrowth from the body (of a tree) which develops into a new individual. The example that can be given here is on mango trees, which are known to be of different varieties. The branch of a female mango tree is sometimes cut off and transplanted to another stem of a male tree and sometimes they continue growing, until when the fruit grows that one can distinguish between them. This is a form of asexual reproduction limited to plants of relatively simple structure. In this process, a portion of the wall of the parent cell softens and pushes out (Obmar, 2008:31). Related to the growth of plants, the Qur'an states:

﴿ وَهُوَ ٱلَّذِىٓ أَنزَلَ مِنَ ٱلسَّمَآءِ مَآءً فَأَخْرَجْنَا بِهِۦ نَبَاتَ كُلِّ
شَىْءٍ فَأَخْرَجْنَا مِنْهُ خَضِرًا نُّخْرِجُ مِنْهُ حَبًّا مُّتَرَاكِبًا وَمِنَ
ٱلنَّخْلِ مِن طَلْعِهَا قِنْوَانٌ دَانِيَةٌ وَجَنَّٰتٍ مِّنْ أَعْنَابٍ وَٱلزَّيْتُونَ
وَٱلرُّمَّانَ مُشْتَبِهًا وَغَيْرَ مُتَشَٰبِهٍ ٱنظُرُوٓا۟ إِلَىٰ ثَمَرِهِۦٓ إِذَآ أَثْمَرَ وَيَنْعِهِۦٓ
إِنَّ فِى ذَٰلِكُمْ لَءَايَٰتٍ لِّقَوْمٍ يُؤْمِنُونَ ﴿٩٩﴾ ﴾

> *And it is He Who send down rain from the sky, and We produce thereby the growth of all things. We produce from it greenary from which We produce grains arranged in layers. And from the palm tree-of its emerging fruit are clusters hanging low. And (We produce) gardens of grapevines and olives and pomegranates, similar yet varied. Look at (each of) its fruits when it yields and (at) its ripening. Indeed in that are signs for a people who believe.* (al-An'am, Q6:99)

The above verse clearly indicates that, Allah creates the plants and uses rain water which determines their growth. The verse also points out the idea of the growth of different plants with the same water. This portrays the work of Almighty Allah Who alone can create.

Commenting on the verse (Q6:99) above, Al-Mahalli *et al* (1431A.H:437) explains that Allah (SWT) send down rain water in due amount as a blessing and provision for His servants. With this water, vegetation of every kinds is created to sprouting; and out of this, Allah (SWT) brings forth green stalks of produce and trees, on which He grows fruits and seeds. He also brought forth thick clustered grain, meaning lined on top of each other in clusters, like spikes of grain and

the like thereof. Allah (SWT) also creates date palm that are within reach and easy to be picked. Gardens of grapes, olives and pomegranates are also produced through rain water.

Almighty Allah shows His sign and power in creating fruits that He brought into existence when they were merely dried wood. He causes them to become dates, grapes and the like. The colors, sizes, tastes, scents and other things of plants and fruits vary. Water is the main thing used to make them grow and vary. This fact is worthy of being contemplated by mankind, as it shows perfection of Allah's ability, wisdom and mercy.

2.11.3 *Chlorophyll in Plants*

The nature of plants is that most of them are greenish in colour. Plants are in most cases green due to the reason that they have a chemical called chlorophyll. This chlorophyll is derived from the leaves which are the most important part of the plant factory. The leaves are regarded as the chemical laboratory. According to Encyclopaedia Britannica (2008:9), the chloroplasts which contain the pigment chlorophyll carry out photosynthesis, which all life on earth depends on.

Without photosynthesis, no green plants will exist and without the green plants, animals' life is not possible. Chlorophyll is found in special structures within the cells of plants or organelles called chloroplasts. It should be understood that animals, fungi, and protozoa do not have the ability to produce chlorophyll and do not have chloroplast.

The Glorious Qur'an mentions an idea related to chloroplast in plants where Almighty Allah says:

﴿ وَهُوَ ٱلَّذِىٓ أَنزَلَ مِنَ ٱلسَّمَآءِ مَآءً فَأَخْرَجْنَا بِهِۦ نَبَاتَ كُلِّ
شَىْءٍ فَأَخْرَجْنَا مِنْهُ خَضِرًا نُّخْرِجُ مِنْهُ حَبًّا مُّتَرَاكِبًا
وَمِنَ ٱلنَّخْلِ مِن طَلْعِهَا قِنْوَانٌ دَانِيَةٌ وَجَنَّٰتٍ مِّنْ أَعْنَابٍ
وَٱلزَّيْتُونَ وَٱلرُّمَّانَ مُشْتَبِهًا وَغَيْرَ مُتَشَٰبِهٍ ٱنظُرُوٓا۟ إِلَىٰ ثَمَرِهِۦٓ
إِذَآ أَثْمَرَ وَيَنْعِهِۦٓ ۚ إِنَّ فِى ذَٰلِكُمْ لَـَٔايَٰتٍ لِّقَوْمٍ يُؤْمِنُونَ ﴿٩٩﴾ ﴾

And it is He Who send down rain from the sky, and We produce thereby the growth of all things. We produce from it greenary from which We produce grains arranged in layers. And from the palm tree-of its emerging fruit are clusters hanging low. And (We produce) gardens of grapevines and olives and pomegranates, similar yet varied. Look at (each of) its fruits when it yields and (at) its ripening. Indeed in that are signs for a people who believe. (al-An'am, Q6:99)

The source of every vegetation, green crops, grains, date palms and other fruits mentioned in the above verse is Almighty Allah. All these things were created for man's use. The verse also shows that before botanists informed the world of the presence of chlorophyll in plants, the Creator preceded them for hundreds of years.

The Arabic word al-Khadir mentioned in the text of the verse refers to green substance (chlorophyll). They are built up by the plant at the beginning of their growth, and are called "Chloroplasts" by botanists. Al-Zanadanee (1980:1) explains that, these green factories (chloroplasts) contain the chlorophyll that the plant utilizes the light energy and converts it into chemical energy that leads to the production of different kinds of grains, fruits and other vegetation parts we see in the field and garden.

What is worth mentioning here is that, the above facts were not known to people until 1600 C.E after 300 years spent on research by botanists in the field of botanical physiology to understand the process of photosynthesis. In relation to this, al-Zanadanee (1980:1) gives three examples of botanical

scientists: De Saussure (1804C.E), Meyer (1942C.E) and Glass (1961C.E) who conducted researches to explain the nature of plants in relation to their green substance and the process of photosynthesis.

It is necessary to state that, the Qur'an has shown an aspect of miracle, as contained in chapter 6:99 above which portrays the presence of green substance (chlorophyll) in plants. The green substance's importance is so great, in that it is responsible for the production of fruits, grains, trees and vegetation. Scientists (botanists) have only discovered the presence of green substance in plant which absorb light energy and change it to chemical energy to produce fruits of different varieties. They have taken longer time after carrying series of researches and experiments before discovering these facts.

One important question to ask is this: Who told Muhammad (S.A.W) the presence of green substance in plants? The answer is not far fetched. Allah, the Creator Who revealed the Qur'an more than one thousand four hundred years ago is the One Who revealed this fact. This then

indicates that the Qur'an is the true words of Almighty Allah, because this scientific fact wouldn't have been known to the Prophet (SAW), who was illiterate, did not have ordinary equipment to conduct experiment, let alone modern sophisticated equipment for scientific research. In a nutshell, this is a great sign for us to understand Allah, the Creator. Almighty Allah mentioned the green substance found in plants because He knows the role they play in the production of fruits, grains and all vegetation and trees.

2.12 Water and its Importance to life

Water is one of the necessities of life. When Allah (SWT) created the earth and heaven, according to Ahmad (2010:14), He created water, because it was essential for man and other living organisms around. The benefits of water is so great, because it is the substance of life, and without it, life in our planet (earth) is not possible. Ahmad (2010:15) further indicates that, water was mentioned in the Qur'an in the indefinite form Ma'un 33 times and in the definite form al-ma 16 times. The importance of water is portrayed in the Glorious Qur'an, where Almighty Allah states:

﴿ هُوَ ٱلَّذِىٓ أَنزَلَ مِنَ ٱلسَّمَآءِ مَآءً لَّكُم مِّنْهُ شَرَابٌ وَمِنْهُ شَجَرٌ فِيهِ تُسِيمُونَ ﴿١٠﴾ يُنۢبِتُ لَكُم بِهِ ٱلزَّرْعَ وَٱلزَّيْتُونَ وَٱلنَّخِيلَ وَٱلْأَعْنَـٰبَ وَمِن كُلِّ ٱلثَّمَرَٰتِ ۗ إِنَّ فِى ذَٰلِكَ لَـَٔايَةً لِّقَوْمٍ يَتَفَكَّرُونَ ﴿١١﴾ ﴾

It is He Who sends down rain from the sky; from it is drink and from it is foliage in which you pasture (animals). He causes to grow for you thereby the crops, olives, palm trees, grapevines and from all the fruits. Indeed, in that is a sign for people who give thought.

(an-Nahl, Q16:10-11).

The above verse mentions the origin of water, that is the sky and its values. It states that Almighty Allah sends down water for us which is drinkable, due to its nature of taste. He did not make it salty, because doing so makes it very difficult for us to drink. The rain (water) is also used for the growth of our vegetation, the crops, olives, date palms, fruits and other things.

The Almighty Allah has mentioned about the origin of every animal (which is water). This is contained in the following Qur'anic verse:

﴿ وَٱللَّهُ خَلَقَ كُلَّ دَآبَّةٍ مِّن مَّآءٍ فَمِنْهُم مَّن يَمْشِى عَلَىٰ بَطْنِهِۦ وَمِنْهُم مَّن يَمْشِى عَلَىٰ رِجْلَيْنِ وَمِنْهُم مَّن يَمْشِى عَلَىٰٓ أَرْبَعٍ يَخْلُقُ ٱللَّهُ مَا يَشَآءُ إِنَّ ٱللَّهَ عَلَىٰ كُلِّ شَىْءٍ قَدِيرٌ ﴿٤٥﴾ ﴾

Allah has created every living (creature) from water. And of them are those that move on their bellies, and of them are those that walk on two legs, and of them are those that walk on four. Allah creates what He wills. Indeed, Allah is over all things competent.

(an-Nur, Q24: 45)

In another related verse, He again says:

﴿ وَهُوَ ٱلَّذِى خَلَقَ مِنَ ٱلْمَآءِ بَشَرًا فَجَعَلَهُۥ نَسَبًا وَصِهْرًا ۗ وَكَانَ رَبُّكَ قَدِيرًا ﴿٥٤﴾ ﴾

And it is He Who has created from water (i.e, semen) a human being and made him (a relative by) lineage and marriage. And ever is your Lord competent (concerning creation).

(al-Furqan, Q25: 54)

In Q24: 45 above, Almighty Allah` clearly informs us that He created all dabbah (living creatures) from water. Living creatures include every living thing that move on this earth. Water is used as a source of creation of the living organisms

and it refers to the drops of male and female sexual discharge when they are mixed.

In the second verse (Q25:54), specification has been made as regard to the origin of man, whom Allah (SWT) created also from water, meaning the sperm of man and woman's ovum when they are mixed. This in essence indicates the biological origin of man, through which the blood and marriage relationships are established.

The Glorious Qur'an also mentions another importance of water where it states:

﴿ وَهُوَ ٱلَّذِىٓ أَنزَلَ مِنَ ٱلسَّمَآءِ مَآءً فَأَخْرَجْنَا بِهِۦ نَبَاتَ كُلِّ شَىْءٍ فَأَخْرَجْنَا مِنْهُ خَضِرًا نُّخْرِجُ مِنْهُ حَبًّا مُّتَرَاكِبًا وَمِنَ ٱلنَّخْلِ مِن طَلْعِهَا قِنْوَانٌ دَانِيَةٌ وَجَنَّٰتٍ مِّنْ أَعْنَابٍ وَٱلزَّيْتُونَ وَٱلرُّمَّانَ مُشْتَبِهًا وَغَيْرَ مُتَشَٰبِهٍ ٱنظُرُوٓا۟ إِلَىٰ ثَمَرِهِۦٓ إِذَآ أَثْمَرَ وَيَنْعِهِۦٓ إِنَّ فِى ذَٰلِكُمْ لَءَايَٰتٍ لِّقَوْمٍ يُؤْمِنُونَ ﴿٩٩﴾ ﴾

And it is He Who send down rain from the sky, and We produce thereby the growth of all things. We produce from it greenary from which We produce grains arranged in layers. And from the palm tree- of its emerging fruit are clusters hanging low. And (We produce) gardens of grapevines and

olives and pomegranates, similar yet varied. Look at (each of) its fruits when it yields and (at) its ripening. Indeed in that are signs for a people who believe.

(al – An'am. Q6:99)

The above verse (Q6:99) draw the attention of mankind to contemplate on the ability of Almighty Allah Who creates the plants and fruits. Some of them were sown and some naturally germinate; some of them were dried seeds and dead, because of contact with water, they continue growing, and after some passage of time, they are plucked as fruits and consumed.

Another importance of water is that, it is used for irrigation purposes. During the dry season, some crops and fruits are planted in the swampy areas through man made efforts, i.e. irrigation. The practice of irrigation helps to boost the agricultural development of people. The Companions of the Prophet (SAW) practiced irrigation to boost their economy. At one time when an Ansari querreled with az-Zubair (the Prophet's aunt son), according to the report of Urwa (d.94A.H), the Messenger of Allah (SAW) said:

"يا زبير، اسق ثم أرسل. فقال الأنصاري: إنه بريء منك؟ فقال عليه السلام: اسق يا زبير ثم يبلغ الماء الجدر ثم أمسك. فقال الزبير: فأحسب هذه الآية نزلت في ذالك "فلا وربك لا يؤمنون حتى يحكموك فيما شجر بينهم" (رواه البخاري)

O Zubair; Irrigate (your land) first and then let the water flow (to the land of others). On that, the Ansari said (to the Prophet, S.A.W): It is because he is your aunt's son. On that the Prophet (S.A.W) said. "O Zubair irrigate till the water reaches the walls between the pits around the trees and then stop. That is, let the water go to the others land.

(Bukhari, vol .3 Hadith 549)

I think the following verses was revealed concerning the event:

﴿ فَلَا وَرَبِّكَ لَا يُؤْمِنُونَ حَتَّىٰ يُحَكِّمُوكَ فِيمَا شَجَرَ بَيْنَهُمْ ثُمَّ لَا يَجِدُوا فِي أَنفُسِهِمْ حَرَجًا مِّمَّا قَضَيْتَ وَيُسَلِّمُوا تَسْلِيمًا ﴿٦٥﴾ ﴾

But no, by your Lord, they will not (truly) believe until they make you (O Muhammad), judge concerning that over which they dispute among themselves and then find within themselves no discomfort from what you have judged and submit in (full, willing) submission.

(an-Nisai, Q4:65)

In the above Hadith, the Prophet (S.A.W) taught one of his Companion (Az-zubair) how to make irrigation on his farm

to benefit his neighbour. This tells us that Islam has left nothing untouched. It provides guidance even in issues related to farming.

Water is also used for drinking purposes. Man needs a huge quantity of water for consumption and cooking food. This fresh water is obtained from the ground; such as rivers, wells, streams, oceans etc. Almighty Allah as explained by Wadud (1982:223) is the One Who stores and distributes water

﴿ وَأَنزَلْنَا مِنَ ٱلسَّمَآءِ مَآءًۢ بِقَدَرٍ فَأَسْكَنَّٰهُ فِى ٱلْأَرْضِ ۖ وَإِنَّا عَلَىٰ ذَهَابٍۭ بِهِۦ لَقَٰدِرُونَ ﴿١٨﴾ ﴾

And We have sent down rain from the sky in a measured amount and settled it in the earth. And indeed, We are able to take it away.
(al-Muminun 23:18)

Almighty Allah has shown that He gives us rain according to our needs (in due measure). If He liked, He could cause it to divert to waste lands and wilderness, make it go deep underground where people would not be able to reach it and therefore become unbeneficial, or make it salty that

resulted to its being undrinkable as shown in Surah al-Waqi'ah where Allah says:

﴿ أَفَرَءَيْتُمُ ٱلْمَآءَ ٱلَّذِى تَشْرَبُونَ ﴿٦٨﴾ ءَأَنتُمْ أَنزَلْتُمُوهُ مِنَ ٱلْمُزْنِ أَمْ نَحْنُ ٱلْمُنزِلُونَ ﴿٦٩﴾ لَوْ نَشَآءُ جَعَلْنَٰهُ أُجَاجًا فَلَوْلَا تَشْكُرُونَ ﴿٧٠﴾ ﴾

And have you seen the water that you drink? Is it you who brought it down from the clouds, or is it We Who brings it down? If We willed, We could make it bitter, so why are you not grateful?.

(al-Waqi'ah, 56:68-70).

On the contrary, fresh water is sends down for us, then it settles on the earth and forms rivers and springs that we use to irrigate our crops and fruits and give to our livestock.

2.12.1 The Miracles of Creating the Seas:

The significance of water cannot be complete without saying something on the oceans or seas (being large bodies of water). On this Allah states their significance in the following words:

﴿ وَهُوَ ٱلَّذِى سَخَّرَ ٱلْبَحْرَ لِتَأْكُلُوا۟ مِنْهُ لَحْمًا طَرِيًّا وَتَسْتَخْرِجُوا۟ مِنْهُ حِلْيَةً تَلْبَسُونَهَا وَتَرَى ٱلْفُلْكَ مَوَاخِرَ فِيهِ وَلِتَبْتَغُوا۟ مِن فَضْلِهِۦ وَلَعَلَّكُمْ تَشْكُرُونَ ﴿١٤﴾ ﴾

> *And it is He Who subjected the sea for you to eat from it tender meat and to extract from it ornaments which you wear. And you see the ship plowing through it, and (He subjected it) that you may seek of His bounty; and perhaps you will be grateful.*
>
> (an-Nahl, Q16:14)

Allah indicates in the above verse, some of the significance of the sea. It is from them that we get fish and other aquatic animals which are taken as food. Al-Mahalli *et al* (1431A.H:769) and Ibn Kathir (1975:76) maintained that, man also gets treasures from the deep of seas such as pebbles, pearls, coral, gold, etc. The ships that plough the waves are used for maritime and commercial activities. This takes place between one country and the other (on international basis) or one region and the other (such as between one state and the other within a particular country). All these boost the level of our economy. Any country that lacks sea coast for maritime activities hardly prosper in economic matters, because there will be difficulty in the exportation and importation of goods.

Almighty Allah draws the attention of mankind to examine how He subjected the sea which carry ships for our

benefit. This fact is contained in Surah Luqman (Q31:31) and Surah al-Baqarah (Q2:164).

One wonders according to Maraya (2010) how a small object (such as stone) thrown into the sea cannot float on, but goes beneath it (by sinking), but a ship does not submerge, but flow in the surface of the water. According to www.google.com, the biggest ship in the world (Titanic) carry 3327 people at a time. Out of this number, morethen two thirds are passengers and 892 are crew of the ship. If to say luxurious buses would be used to carry the above number of people and their luggages, the bus that has 60 seats would make 41 trips to carry the passengers. 41 trips x 60 will give 2460. It will also make an additional 15 trips to carry the crew of the ship. 15x60 = 900 -18= 892. The bus will also make so many trips to carry the luggages contained in that particular ship. This is a great sign of Allah for those who have great thought and His fear. Almighty Allah informed us in the Qur'an since the 7th century C.E. about the idea of ship and its benefits. Scientists started technological invention between the 15th – 20th century C.E.

The following things can be deduced from Q16:14 above:

1. Almighty Allah subjected the seas and rivers for the benefit of mankind such as irrigation and trading on them by ship.
2. He endowed man with intelligence, hence, the latter uses the former's given intelligence to fish from the rivers and seas to get means of livelihood.
3. Man also uses his intelligence to build local canoes and modern ships to ease transportation by rivers and seas.
4. Some ornaments like pearls, gold, coral, and pebbles are derived from the seas, which help man to boost his economy.

The seas created by Almighty Allah are generally of two types in order of their nature. There is fresh sea and salty sea as indicated in the following verse:

﴿ وَمَا يَسْتَوِي ٱلْبَحْرَانِ هَٰذَا عَذْبٌ فُرَاتٌ سَآئِغٌ شَرَابُهُۥ وَهَٰذَا مِلْحٌ أُجَاجٌ وَمِن كُلٍّ تَأْكُلُونَ لَحْمًا طَرِيًّا وَتَسْتَخْرِجُونَ حِلْيَةً تَلْبَسُونَهَا وَتَرَى ٱلْفُلْكَ فِيهِ مَوَاخِرَ لِتَبْتَغُوا۟ مِن فَضْلِهِۦ وَلَعَلَّكُمْ تَشْكُرُونَ ﴿١٢﴾ ﴾

And not alike are the two seas (i.e bodies of water). One is fresh and sweet, palatable for drinking, and one is salty and bitter. And from each you

eat tender meat and extract ornaments which you wear, and you see the ships plowing through (them) that you might seek of His bounty; and perhaps you will be grateful.

(al-Fātir, Q35:12)

Imam Qurṭubi (1423A.H:566) as cited by Ahmad (2010:4) commented on the meaning of the above verse, in which he said that "sweet and palatable water" refers to the rain and water of rivers, and "salt and bitter" means sea water. He further added that Almighty Allah mixes the sweet and palatable river water with the salty and bitter sea water, then He prevents the salt from affecting or corrupting the freshness of fresh water by His decree.

The Qur'an also mentions the presence of a partition placed between the two bodies of water in the following verse:

﴿ مَرَجَ ٱلْبَحْرَيْنِ يَلْتَقِيَانِ ﴿١٩﴾ بَيْنَهُمَا بَرْزَخٌ لَّا يَبْغِيَانِ ﴿٢٠﴾ ﴾

He has let free the two bodies of flowing water meeting together. Between them is a barrier which they do not transgress.

(ar-Rahman, Q55: 19-20)

The barrier referred to in the above verse does not mean that a line or pillar is placed between the two flowing bodies of water. They meet together and yet one does not transgress into the other. Al-Mahalli *et al* (1431A.H:1526) upheld the view

that the two bodies of water (fresh and salty) can never get mixed together as ordained by Almighty Allah. It will be interesting to note that, when the water from one sea enters the other sea, it loses its distinctive features and become homogenized with the other water

Commentators of the Glorious Qur'an such as al-Qurṭubi (1423 A.H:58), Ibn Jawzi (1384A.H:90) and Zamakhshari (1385A.H:96) highlighted on the idea of barrier mentioned in Q55:19-20 above, and other similar verses. They stated that, its meaning refers to a partition created by Allah (SWT) the exalted, and it can never be seen.

The two flowing bodies of water according to Baghawi (1417AH) are the fresh and salty water which meet without being mixed, or changed. Through the will of Almighty Allah, they do not transgress. *'None of them transgress'* according to Qatāda (d.117A.H) means that they do not lead to the drowning of people. Hassan (d.101AH) indicates that, the two seas referred to in the above verse include the river Nile and Indian Ocean, in which a barrier is placed between them. Qatāda interpreted the meaning of the two seas in which he

said that, they are river Nile and Paris river. On the contrary, Mujāhid (d.103A.H) and ad-Dahhak (d. 212A.H) highlighted that they refer to the rain water which gushes from earth and they meet every year.

The categorization of the seas into two (fresh and salty bodies of water) and the barrier placed between them was only discovered in 1924. The scientists' discovery on the above facts was possible by using advanced equipment to measure density, oxygen dissolubility, salinity and temperature. In addition to this, Naik (2001:30) explains that the scientific phenomena mentioned in the Qur'an above were confirmed by a well known oceanologist and professor of Geological science (Dr. William Hay) at the university of Colorado, U.S.A.

The importance of oceans, seas and rivers cannot be over emphasized. They help man to get a lot of things which he uses as food and clothing matters. Numerous things are found in these bodies of water. Imam Ibn Kathir (1975:88) cited a Hadith reported by Umar bn Khattab (R.A) in which the Messenger of Allah (S.A.W.) mentioned that:

"خلق الله ألف أمة منها ستمائة في البحر وأربعمائة في البر"
Allah (SWT) created one thousand different communities of creation, six hundred are found in the oceans and other bodies of water and four hundred are found on the land.

The above Hadith shows that, the issue of creation is in the hands of Almighty Allah exclusively. He has given limited knowledge to man. It is therefore necessary to state that scientists' knowledge on creation is only limited to what they can see. There are lots of creatures that are kept beneath the oceans and rivers that no human being has ever seen nor to think of even their names.

2.12.2 The Nature of Deepness in the Oceans

Almighty Allah created small and large bodies of water. The large bodies of water like the atlantic, pacific, Indian ocean and Mediterranean sea, and the like are so deep that diving in them is not possible without the use of modern equipment. Allah (SWT) mentions about the deepness of oceans and seas in the Glorious Qur'an, where He says:

﴿أَوْ كَظُلُمَٰتٍ فِي بَحْرٍ لُّجِّيٍّ يَغْشَىٰهُ مَوْجٌ مِّن فَوْقِهِۦ

مَوْجٌ مِّن فَوْقِهِۦ سَحَابٌ ظُلُمَٰتُۢ بَعْضُهَا فَوْقَ بَعْضٍ إِذَآ
أَخْرَجَ يَدَهُۥ لَمْ يَكَدْ يَرَىٰهَا ۗ وَمَن لَّمْ يَجْعَلِ ٱللَّهُ لَهُۥ نُورًا فَمَا لَهُۥ
مِن نُّورٍ ﴿٤٠﴾

Or (they are) like darknesses within an unfathomable sea which is covered by waves, upon which are waves, over which are clouds-darknesses, some of them upon others. When one puts out his hand (therein), he can hardly see it. And he to whom Allah has granted light-for him there is no light.

(an-Nur,Q24:40)

A description is made on the state of an unbeliever and his evil deeds which Almighty Allah compared to the darkness in a vast deep sea, overwhelmed by great wave topped by a great wave, topped by dark clouds, darkness, one above another. Al-Mahalli *et al* (1431 A.H:1029) highlight that the meaning of the above verse refers to the nature of darkness in the sea, as well as the darkness of the first lower wave and the topped great wave and cloud darkness. In this overwhelming darkness, if a man stretches his hand, it is going to be very difficult for him to see it, due to the intensity of the darkness.

Imam Qurṭubi (1423A.H:565-566) in his commentary of the above verse (Q24:40) states the meaning of the darkness mentioned in it. He opines that, it refers to darkness of clouds, waves, night, and sea because anybody who finds himself in all these darknesses cannot see anything.

The above verse (Q 24:40) is scientifically miraculous according to Ahmad (2010:51) because of the following obvious reasons:

1. It clearly mention that darkness exist in the depths of the sea, that are piled one on top of the other.
2. Internal waves are usually found in the deep oceans and seas.
3. Thick cloud usually cover the deep oceans and seas which block a considerable amount of the sun's rays.

Ahmad (2010:52) further asserts that, the above facts were discovered by the end of 19th century through scientific studies. Modern science in the 20th century discovered a strange phenomenon that only occurs in the vast deep sea. Red colour disappears when light reaches a depth of 5 meters,

when it treaches 30 metres, a new type of darkness emerges, in which orange light disappears. Yellow light begins to disappear at the depth of 50 metres. Green light disappears at the depth of 100 metres. Blue light disappears at the depth 200 metres. Everything appear black at the depth of 500 metres; and the diver can only see what looks like moving shadows: *'If a man stretches his hand, he can hardly see it'*. Ahmad further states that the description of the Qur'an is very accurate, because it does not say that man cannot see his hand at all, rather it says: he can hardly see it. This means that certain images can be seen, despite that everything looks black.

Naik (2001:33) maintains that, the ocean progressively becomes darker due to successive disappearance of colour, one layer after another. This clearly means that darkness take place in layers of light. That it is only when the diver goes below a depth of 1000 metres that there is complete darkness.

It should be noted that scientists were able to confirm about the nature of darkness in the depths of the ocean between the 19th – 20th centuries. Almighty Allah is the One

who equipped them with this knowledge, while He mentions about the darkness in deep seas in the Qur'an in the 7th century as shown above. The knowledge acquired by oceanographers and marine scientists is limited, because they can not precisely mention everything that is beyond their sight or anything that their equipments cannot reach, when taking photographs.

2.13 Nature of Fruits:

Plants are created in pairs. The nature of fruits is that they are also created in pairs, male and female, as confirmed in the Qur'an:

﴿ وَهُوَ ٱلَّذِى مَدَّ ٱلْأَرْضَ وَجَعَلَ فِيهَا رَوَٰسِىَ وَأَنْهَٰرًا ۖ وَمِن كُلِّ ٱلثَّمَرَٰتِ جَعَلَ فِيهَا زَوْجَيْنِ ٱثْنَيْنِ ۖ يُغْشِى ٱلَّيْلَ ٱلنَّهَارَ ۚ إِنَّ فِى ذَٰلِكَ لَءَايَٰتٍ لِّقَوْمٍ يَتَفَكَّرُونَ ﴿٣﴾ ﴾

It is He Who spread the earth and placed therein firmly set mountains and rivers, and from all of the fruits He made therein two mates; He cause the night to cover the day. Indeed, in that are signs for a people who give thought.

(al-Ra'ad, Q13:3)

Allah created variety of fruits and vegetables which emanate from the same soil and enjoy the same water. Another thing to contemplate on the wonderful nature of Allah is that the fruits have different smell and taste. For example, Allah gives matchless tastes and appearance to grapes, kiwis melons, pineapples, guava, orange, cashew, mango, using the same water and minerals. This further reveals the Mighty nature of Allah and His matchless artistry in creation (api.fmanager.net/apiVI/productDeail.php?dev-=EDCRFV &objected =5055).

According to Yahaya (1980:1) the survival of animals and human beings depend on the energy they get through nutrition produced by plants. The essence of creating plants is to benefit all living things on earth especially human beings. Through His wisdom, Allah created fruits that befit each season according to the people's needs. These fruits have ingredients and enticing smells. An example that can be given is regarding oranges, tangerines, cashews which are used during the winter season. In summer season, water melon

which is a juicy fruit is created when the people begin to feel its need ie according to the nature of the period.

In this life, it is not all the fruits that are affordable by common man, because of their expensive nature. Almighty Allah in the Qur'an Has given assurance that the believers will enjoy in paradise with all sorts of enjoyment. They will be given all kinds of fruits which their hearts desire.

The importance of fruits to man's life is numerous. In its explanation on this, Microsoft Encarta (2007:2) maintains that fruits are a source of nourishing substances that keep us alive and healthy. Our body needs carbohydrates and a healthy digestive system to make energy. In order to make this possible, it is the fruits which provide fibre that give these. Fruits also contain many minerals like zinc, potassium and calcium as well as vitamins such as vitamin A and C. They do not have many calories that could make us fat. Other importance of fruits are that they are used for making juices, bread, pie, jams, jellies, sweets, brandies etc.

2.13.1 *The Date*

It has been mentioned previously that one of the uses of plant is that it serves as food. Some of them can be eaten after cooking and some can be eaten after they are ripe. One of the common food that is known in Arabia is the date. The Arab countries that produce date include Algeria, Bahrain, Egypt, Iraq, Libya, Morocco, Oman, Saudi Arabia, Sudan, Syria, Tunisia, the United Arab Emirate (U.A.E) and Yemen. Among the available varieties of dates, according to Gepts (2002:4), six hundred types are said to be produced by Algeria, Egypt, Libya, Morocco and Saudi Arabia. This gives a total of 60% of the world's production. The most expensive date called Anbara is sold at Madinah's date market. In the whole world, Iraq is the toppest producer and exporter of dates. It is followed by Saudi Arabia, Egypt and Algeria.

The only available staple food for the inhabitants of the desert and arid lands is the date palm. According to the statistics of the Food and Agricultural Organisation (F.A.O), there are 90 million date palms in the world and each tree can grow for more than 100 years. Arab countries grow 64 million

trees of dates which give a total of two million tons of dates they produce each year (Gept, 2002:4).

The Glorious Qur'an mentions about date palm in some verses. It says:

﴿ وَفِي ٱلْأَرْضِ قِطَعٌ مُّتَجَٰوِرَٰتٌ وَجَنَّٰتٌ مِّنْ أَعْنَٰبٍ وَزَرْعٌ وَنَخِيلٌ صِنْوَانٌ وَغَيْرُ صِنْوَانٍ يُسْقَىٰ بِمَآءٍ وَٰحِدٍ وَنُفَضِّلُ بَعْضَهَا عَلَىٰ بَعْضٍ فِي ٱلْأُكُلِ ۚ إِنَّ فِي ذَٰلِكَ لَءَايَٰتٍ لِّقَوْمٍ يَعْقِلُونَ ﴿٤﴾ ﴾

And within the land are neighbouring plots and gardens of grapevines and crops and palm trees (growing) several from a root or otherwise, watered with one water, but We make some of them exceed others in (quality of) fruits. Indeed, in that is a sign for people who reason.

(ar-Ra'ad, Q13:4)

The meaning of the above verse according to Mahalli *et al* (1431A.H:717) and Ibn Kathir (2003:237) is that the neighbouring tracts of the earth are adjacent or next to each other. Some of them benefit people due to their fertility, while others are dead, salty and do not produce anything. The meaning of the verse as contained in Tafsir Ṭabari (d. 310A.H) was collected from Ad-Ḍahhak (d.212A.H), Abdullahi Ibn Abbas (d.68AH) Mujāhid Sa'id bn Jubayr (d.95A.H), and other Companions and Successors.

Al-Mahalli *et al* (1431A.H:717) further explained the meaning of *sinwanun* which appeared in the above verse. According to them, it refers to growing out two or three from a single stem root, such as figs, pomegranate and some of the date trees. Ibn kathir (2003:236) highlights that *'Ghayru Sinwan'* means having one stem of every tree. Most plants have one stem.

In the last part of the verse, Allah indicates that despite the fact that the gardens are watered with the same water, their taste are not the same. Some of them are sour while others are sweet, some are bitter, mild or fresh. In some plants, these attributes are combined. In terms of colour, some are white, black, blue, yellow or green. The same thing applies to the flowers. These differences in colour and complex diversities are watered by the same water. (Ibn Kathir, 2003).

According to Qurṭubi (1423A.H:253), Hassan (d.101A.H) said the meaning of the above verse is that Almighty Allah has given an example to mankind who have the same origin but they differed in terms of doing good and evil and their faith

and ungratefulness. Fruits are watered with the same water and they used to differ (in taste, size, smell, etc).

The Almighty Allah, according to his saying in (Q13:4) above is teaching us the nature of His creation in plant kingdom. It is interesting to note that, the growth of plants depends on the presence of the earth and water. The nature of earth varies according to its colour. There are some areas that are red, some are black, yellow, white, dark brown and the like. Allah (SWT) created some parts of earth to be sandy, some loamy, some are flat, stormy, thick or thin on their surfaces. What is grown in a particular place, may not be grown in another place due to the differences of their soil, climatic condition, and the like.

The second important thing responsible for the growth of plants is water. This water may be from the sky (rainfall) or any other source that can be used to water them. Sunlight is equally important in the growth of plants, as it helps in the process of photosynthesis.

Allah (SWT) is the One Who plans what He wishes, as regard to creating things. Even without the presence of earth,

water, and sunlight, He can create the plants within the twinkling of an eye. He explains to us the variations that we see and hear in His creations, so as to draw our attention to believe in Him.

The fruit of the date has one seed which vary in colour, quality of freshness, size, and shape. The nature of their colour is that unriped dates are green, which matures to yellow, then reddish-brown when fully riped. A single large bunch may contain more than one thousand dates and can weigh between 6 to 8 kg. Between five and ten bunches of dates are produced by each tree. 150 pounds and upwards of fruits can be produced by a mature female tree. At 3 to 5 years, date palms start to bear fruit and become fully matured at 12 years. (Gepts, 2002:2)

2.13.2 The Uses of Dates

Date palm is one of the most important plants mentioned in the Qur'an. One of the uses of date according to Qur'an is that it benefits mothers. This can be attested in relation to the story of Maryam (A.S) when she gave birth to Prophet Isah (A.S) under a palm tree, where she heard a voice telling her:

﴿ وَهُزِّيٓ إِلَيۡكِ بِجِذۡعِ ٱلنَّخۡلَةِ تُسَٰقِطۡ عَلَيۡكِ رُطَبٗا جَنِيّٗا ٢٥ فَكُلِي
وَٱشۡرَبِي وَقَرِّي عَيۡنٗاۖ فَإِمَّا تَرَيِنَّ مِنَ ٱلۡبَشَرِ أَحَدٗا فَقُولِيٓ إِنِّي نَذَرۡتُ
لِلرَّحۡمَٰنِ صَوۡمٗا فَلَنۡ أُكَلِّمَ ٱلۡيَوۡمَ إِنسِيّٗا ٢٦ ﴾

And shake toward you the trunk of the palm tree; it will drop upon you ripe, fresh dates. So eat and drink and be contented. And if you see from among humanity anyone, say "Indeed, I have vowed to the Most Merciful abstention, so I will not speak today to (any) man".

(Maryam, Q19:25-26)

Maryam, the mother of Isah (A.S) according to the verses above was fed with ripe dates so as to relieve her of hunger. This clearly shows us that Islam recognizes the value of date even during the time of previous Prophets (S.A.W) who preceeded Prophet Muhammad (SAW).

Other uses of dates mentioned by Gepts (2002:4-5) include the following:

1. Timber and fabric meant for houses and fences are provided by the leaves and wood of date palm.
2. Baskets, cord, crates, and furniture are made with its leaves.

3. The fruit yield food products such as date chutney, date vinegar, date paste for bakery products and additional flavouring, for almonds, bananas and oranges.
4. Ripe and fresh dates are consumed as food.

   Muslims throughout the world normally break their fast with dates in the month of Ramadan, as recommended by the Prophet (SAW).
5. It is important in ceremonies of Judaism, Christianity and Islam. During marriage ceremonies for instance in the Northern part of Nigeria, dates or kolanuts are distributed as means of invitation.
6. Ripe dates has a sugar content of about 80%. What remains consists of fat, protein, and mineral products which include copper, iron, magnesium, fluoric acid, and sulphur. It is also an excellent source of potassium and high in fibre.
7. Eating dates on regular basis results to low incidence rate of heart and cancer disease.
8. Another nutritional benefits of the date palm is that about five dates (which is approximated at 45 grams)

contain about 115 callories, nearly all from carbohydrates.

Adamu (2006:56) pin points that, the Messenger of Allah (S.A.W) stated the importance of eating dates where he said:

> "من تصبح كل يوم سبع تمرات عجوة لم يضره في ذالك اليوم سم ولا سحر".
> (رواه البخاري)
> *If somebody takes seven ajwa dates every morning, he will not be affected by poison or black charm that day."* (Bukhari, Vol. 7, Hadith 663).

The above Hadith was reported by Sa'ad Ibn Abi Waqqas (R.A). It indicates that dates are of different varieties such as Ajwa, mentioned in the Hadith. Others include Balah, al-Burniy, Rath, Tamr, etc. It is shown in the above Hadith that dates are used as a protective agent against some diseases such as blindness and food poisoning.

2.13.3 *The Olive and Fig*

The Glorious Qur'an mentions olive, which is otherwise called Zaytun in Arabic in five or more verses. Olive is one of the fruits that is commonly found in Arabian countries. In Egypt, the best olive grows round about Mount Sinai. The

significance of olive is that it is used as food and has medicinal value. According to Ali (1983:877), olive oil is an ingredient ointments used for religious ceremonies such as the consecration of kings. If used as food, it has a good flavour. Allah states the values of some fruits and grains, where He declared:

﴿ هُوَ ٱلَّذِىٓ أَنزَلَ مِنَ ٱلسَّمَآءِ مَآءً لَّكُم مِّنْهُ شَرَابٌ
وَمِنْهُ شَجَرٌ فِيهِ تُسِيمُونَ ﴿١٠﴾ يُنۢبِتُ لَكُم بِهِ ٱلزَّرْعَ
وَٱلزَّيْتُونَ وَٱلنَّخِيلَ وَٱلْأَعْنَـٰبَ وَمِن كُلِّ ٱلثَّمَرَٰتِ ۗ إِنَّ
فِى ذَٰلِكَ لَـَٔايَةً لِّقَوْمٍ يَتَفَكَّرُونَ ﴿١١﴾ ﴾

It is He Who sends down rain from the sky; from it is drink and from it is foliage in which you pasture (animals). He causes to grow for you thereby the crops, olives, palm trees, grapevines and from all the fruits. Indeed, in that is a sign for people who give thought.

(an-Nahl, (Q16:10-11).

The significance of sending down rain is shown in the above verse. Rain is used by man as a drink which quenches thirst and it is with it that all vegetations grow. Every type of fruit is created by the use of rain or through irrigation. Plants of different colours, taste, scents and shapes are created with

one kind of water. In this, there is a great sign for men of understanding. The blessings of creating fruits such as olive is pointed out in the Qur'an where Almighty Allah says:

﴿ ٱللَّهُ نُورُ ٱلسَّمَٰوَٰتِ وَٱلْأَرْضِ ۚ مَثَلُ نُورِهِۦ كَمِشْكَوٰةٍ فِيهَا
مِصْبَاحٌ ۖ ٱلْمِصْبَاحُ فِى زُجَاجَةٍ ۖ ٱلزُّجَاجَةُ كَأَنَّهَا كَوْكَبٌ دُرِّىٌّ يُوقَدُ مِن
شَجَرَةٍ مُّبَٰرَكَةٍ زَيْتُونَةٍ لَّا شَرْقِيَّةٍ وَلَا غَرْبِيَّةٍ يَكَادُ زَيْتُهَا يُضِىٓءُ
وَلَوْ لَمْ تَمْسَسْهُ نَارٌ ۚ نُّورٌ عَلَىٰ نُورٍ ۗ يَهْدِى ٱللَّهُ لِنُورِهِۦ مَن يَشَآءُ ۚ
وَيَضْرِبُ ٱللَّهُ ٱلْأَمْثَٰلَ لِلنَّاسِ ۗ وَٱللَّهُ بِكُلِّ شَىْءٍ عَلِيمٌ ﴿٣٥﴾ ﴾

Allah is the light of the heavens and the earth. The example of His light is like a niche within which is a lamp. The lamp is within glass, the glass as if it were a pearly (white) star lit from (the oil of) a blessed olive tree, neither of the east nor of the west, whose oil would almost glow even if untouched by fire. Light upon light. Allah guides to His light whom He wills. And Allah presents examples for the people, and Allah is knowing of all things.

(an-Nur, Q24:35)

In the above verse, Allah describes olive as a blessed tree which serves many purposes. Apart from being beautiful in colour, olive is consistent and has an illuminating power. Among the vegetable oils, olive is superb.

The significance of olive oil is that it serves as a source of nutrition and an important source of good health. As stated by www.miracleofthequr'an.com/food-03... in Kanadi (n.d:1). Olive oil is beneficial for coronary and arterial health. Most of the fatty acids in olives and olive oil are mono-unsaturated. Cholesterol are not found in mono-unsaturated fatty acids. This clearly shows that olive oil does not raised cholesterol level, but instead keeps them under control. In addition, it contains omega-6 linoleic acid (EFA:essential fatty acid). That is very essential for the human body. Because of this features, some health organizations susch as World Health Organization recommended that at least 30% of the fatty acid consumed in societies in which hardened artery and diabetes levels are high should consist of omega-6.

Patients with heart and artery diseases are being recommended to use olive oil, as it reduces the level of harmful cholesterol (LDL) in the blood stream and raise that of useful cholesterol (HDL). In countries with high occurrences of heart and artery diseases, saturated fats with high cholesterol

contents are generally consumed. (www.miraclesofthequr'an.com /food-03 in Kanadi (n.d: 2)

Another value of olive oil is that it assist in the development of bones in children and adults, by straightening the bones, by fixing calcium. This is because it has some vitamins-E, A, D and K which do that job. Elderly people are being recommended in using olive oil as it is easily digested, and through its minerals, it assists with the use of vitamins in the body. Loss of calcium in the body are being prevented as a result of taking olive oil.

Olive oil as further elucidated by www.miraclesofthequr'an.com/food-03... contributes to children development. Due to the linoleic acid (omega-6 fatty acid) contains in olives and olive oil, these are the most healthy food for new born babies and growing children. Lack of linoeic acid in the body leads to the emergence of a retardation in babyhood and various skin disorders.

The significance of olive tree is marvelous. Almighty Allah has sworn with two things (trees) in Surah At-Tin (Q95:1). These include the fig and the olive. Ali (1983:1758) is of the

opinion that, the olive used in Q24:35 may be referred to the mount of olives, just outside the Jerusalem's city wall. Mujāhid (d.103A.H) and Ikrimah (d.107A.H) held the opinion that az-Zaytun refers to the olive which people used to extract the oil.

On the other hand, the fig otherwise known as Tin in Arabic is mentioned in the same verse of (Q95:1) as does the olive, as can be seen where Allah says:

﴿ وَٱلتِّينِ وَٱلزَّيْتُونِ ۝١ وَطُورِ سِينِينَ ۝٢ وَهَٰذَا ٱلْبَلَدِ ٱلْأَمِينِ ۝٣
لَقَدْ خَلَقْنَا ٱلْإِنسَٰنَ فِىٓ أَحْسَنِ تَقْوِيمٍ ۝٤ ﴾

By the fig and the olive And (by) Mount Sinai We have certainly created man in the best of stature.
(at-Tin, Q95:1-4)

The fig is one of the four sacred symbols mentioned in Surah at-Tin; others include the olive, mount Sinai and the sacred city of Makka. Allah stated the superiority of man's nature of creation which is in a better form, unlike the animals and other creatures.

2.13.4 Banana Tree

Banana is an example of non fertilized flower (parthenocarpic fruit). The nature of its fruits is white and what covers it is either green (if unriped) or yellow if it is riped. Its taste is very sweet.

In the Glorious Qur'an, a description of Banana is made in relation to what Allah will give to the believers in paradise. One of those fruits they shall be given is banana, as stated in the following verses:

﴿ وَطَلْحٍ مَّنضُودٍ ﴿٢٩﴾ وَظِلٍّ مَّمْدُودٍ ﴿٣٠﴾ وَمَآءٍ مَّسْكُوبٍ ﴿٣١﴾
وَفَٰكِهَةٍ كَثِيرَةٍ ﴿٣٢﴾ ﴾

And (banana) trees layers (with fruit). And shade extended. And water poured out. And fruit, abundant (and varied).

(al-Waqi'ah, Q56:29-32).

In his commentary of the above verse, Ali (1983:1487) explains that, some scholars understood Talh (shown in the verse to mean plantain or banana tree). On the contrary, some scholars are of the view that since the ordinary name of banana is mauz in Arabic and the fact that banana does not

grow in Arabia, it is better understood as a kind of acacia tree whose flowers appears in tiers one above another.

Ibn Kathir (2003:424) upheld that Talh Mandud quoted in Q56: 29-32 above is meant to be a big shrub that is thorny in nature which used to grow in Hijaz area particularly the western part of Arabia. Mandud on the other hand refers to how the fruits are arranged or piled on top of each other. The Qur'an reminds the Arabs by drawing their attention to the shade that is provided by the Talh (Banana) in their environment to illustrate the fact that Allah will provide trees and beautiful garden in paradise that is far better than the ones they know.

Al-Jawziyyah (2003:526) highlights that, majority of scholars have understood the word Talh to mean banana, as they grow in pile one after the other. Banana is very important in that it helps to stimulate the production of semen, arouse sexual drive, soften the stomach especially when they are eaten with honey, which helps to reduce their harmful side effects. It also helps to relieve coughing and help against the ulcers of the kidney and the roughness of the chest and lung.

SUMMARY TO CHAPTER TWO

In chapter two, the researcher reviewed related literature under different sub-topics which have bearing on the aspects of Life Science. The word "science" was defined at the beginning of the chapter in order to enlighten the readers that science has a broader meaning and it entails the study of all aspects of knowledge, not restricted to the study of Biology, Chemistry and Physics, as some people assumed it to be. The relationship between Qur'an and science was also explained. According to the explanation made, Islam is not against science right from its very beginning. The first revealed verse of Qur'an to the Prophet (S.A.W) entails an encouragement or command on two things- reading and writing.

The researcher also discussed the concept of evolution, dealing with man's and animals' evolutionary history and nature. Evolution by its nature is a process that is continuous and according to the plans of Almighty Allah. The researcher refuted the modern theory of evolution propounded by Western thinkers like Charles Darwin (d.1882C.E) and others who upheld that man was formally an ape, among other ideas.

Detailed explanation on man and animal's evolution, biological aspects of human growth and development, the science of genetics were also given. On these, the researcher quoted relevant verses from the Qur'an to elucidate whatever were explained.

The sensory organs of man is an aspect that was highlighted in chapter two. The researcher deemed it necessary to do so because man as a vicegerent of Allah on earth was created to serve the latter. In order to serve Him (Allah) effectively, man was created and endowed with the sensory organs. The senses of hearing, sight and other sense organs enable man to be able to distinguish between the right and wrong acts and be comfortable in relation to his perception of things. The idea of man's acquisition of soul was also discussed. The soul and brain of man enable him to judge correctly, and that makes him to behave in the right way, unlike the animals.

The science of embryology was elucidated in the Literature Review. The researcher explained some miracles of the Qur'an in relation to human creation. The creation of man

in three veils of darkness, the stages of human development which entail the Nutfah (minute quantity of sperm stage), the 'Alaqah (leech or blood of clot stage), Mudghah (chewed like substance stage), the 'Izam (bony formation stage), the Lahm (muscular flesh stage), and the Nash'ah or (foetal growth stage) were also explained with quotations from the Glorious Qur'an and Ahādith of the Prophet (S.A.W).

In the second major aspects of the chapter, the researcher dealt with the nature of Prophet's teachings to his Companions on some aspects of life science such as the study of plants and animals. The importance of plants, how they reproduce, chlorophyll in plants, uses of water especially as regard to vegetation, the nature of fruits and some examples and importance mentioned in the Qur'an were highlighted with supportive quotations and analysis of the views of Mufassirun (Qur'anic commentators) on them.

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CHAPTER THREE
METHODOLOGY

3.0 Introduction

In this chapter, the researcher explains the research method employed, sources of data collection, procedure of the research; the broad areas of research in Islamic Studies and places visited to collect the data used.

3.1 Research Method Employed:

The research topic deals with some aspects of Life science in the Qur'an. This implies that it is a non-experimental research. According to Baba (2005:12), a research in which variables are not manipulated and the researcher has no control over them is called "Non-experimental" or "Descriptive" research. What is expected of the researcher is to describe a given phenomenon and its existing characteristics. The examples of non-experimental research identified by Baba (2005:12) include survey and correlational researches. However, the researcher categorized the data he collected as follows:

3.1.2 Primary Sources

The researcher used the Glorious Qur'an and Ahädith of the Prophet (S.A.W), which served as the primary sources of data. This is in view of the fact that, the research report cannot be possible and convincing enough without the use of these two primary sources of Islamic Law. They served as guide to the major things explained, especially in the Literature Review.

As for the Qur'an, more than one hundred verses were quoted, under different sub-topics, in order to provide appropriate evidence on the scientific facts that were explained.

In some of the verses quoted, the views of commentators of the Glorious Qur'an were analysed on the meaning of the verses. In other words, the classical books of Tafsir were considered also as primary sources. Some of these Tafāsir include Tafsir Al-Qur'an, al-Azim of Ibn Kathir (d. 774A.H/1373C.E), Tafsir Al-Ahkam al-Qur'an of Abu Abdullahi, Muhammad, Ibn Ahmad al-Ansari, al-Qurtubi (d. 671A.H/1273C.E), Tafsir al-Jalalayn of Jalaluddin as-Suyuti

(d. 911A.H/505C.E) and Jalaluddin al-Mahalli (d. 864A.H/1460C.E), Tafsir Fath al-Qadir of Muhammad bn Ali Ash-Shawkani (d.1255A.H/1839C.E), Tafsir Ma'alimat-Tanzil of al-Husayn Ibn Muhammad al-Baghawi (d. 510A.H./1117C.E), among other Tafāsir.

The researcher also used some contemporary Tafāsir written by prominent scholars in Nigeria, such as the Tafsir, Rad al-Azhan ila Ma'anil Qur'an of late Sheikh Abubakar Mahmud Gumi (d. 1413A.H/1992C.E) and the Tafsir of Sheikh Tahir Uthman Bauchi. In case of the second one, the researcher listened to the commentary of some verses on cassettes and documented them. These were also included among the primary sources of data.

Hadith, which is the second primary source of Islamic Shariah were quoted in the Literature Review (chapter two) and chapter four as well. In a nutshell, the researcher quoted more than twenty ahādith from different collections such as that of Imam Bukhari, Muslim, Sunan Ibn Majah, Sunan Abu Dawud, Sunan Ahmad, etc. These Ahādith were quoted in order to supplement the Qur'anic verses or prove that the

Prophet (S.A.W) also made explanation on many scientific facts.

3.1.3 Secondary Sources:

The following were the secondary sources used in data collection peculiar to the research:-

3.1.4 Textbooks:

The researcher used so many textbooks in Chapter one (Introduction), Chapter two (Literature Review) and Chapter four (Analysis on some areas of compatibility between some aspects of Life Science and the Glorious Qur'an). These textbooks dealt with Animal Science, Human embryology, Plant Science, Linguistics and Research methods.

3.1.5 Seminar Papers:

The researcher used three International Seminar papers, out of which two were written by some eminent scholars in Nigeria, and the remaining one was written by a non-Nigerian.

3.1.6 Website Materials:

Data was obtained from some search engines (websites). These search engines are computer software developed to help internet users to search for information. The commonest

search engine used by the researcher was the popular Google at www.google.com. Other websites visited include www.acryfromanhonestsoul.com, www. farasan. org/articles.com,www,5a.net,www.Islamonline.net,www.Qur'a n miracles.com. sixteen authors were cited in the main work whose materials were obtained from the above websites and others.

The researcher deemed it necessary to get data from the internet in order to ensure that the research reports contains current and up-to-date issues that relate to the topic under investigation. Before selecting any material from the websites, the researcher evaluated it so as to ensure its relevance and authenticity.

3.1.7 Computer Programmes

Another important secondary source used by the researcher to obtain data was computer programmes. Relevant data were obtained from Britannica Ultimate Reference Suite and Microsoft Encarta Kids. The data obtained here largely related to Animals and Botany.

3.1.8 Journals

The researcher obtained data from some journals in order to ensure the inclusion of current and up-to-date information on the research topic.

3.2 Procedure of the Research

The researcher divided this work into three major parts, comprising of Human Embryology, Animals and Plants Science (which dealt with Life Science). Each of these three areas were broken into sub-topics, which were reviewed, with explanation of the views of the different writers. The explanations were supported by quotations from the Qur'an (as said before), as well as some Ahãdith texts that are directly related to the scope of the study. Where possible, the researcher also explained the ideas of modern scientists on different issues, in order to show how they are compatible with some verses of the Glorious Qur'an.

The researcher after identifying the problems related to the research (criticisms of the orientalists on Qur'an), then went ahead to gather data related to it. This research does not require the formulation of hypothesis, for the obvious reason

that, the Qur'an and Hadith are the words of Almighty Allah and His Prophet (S.A.W), and cannot therefore be reduced to hypothesis formulation which are based on assumption or guess. Therefore, the researcher framed some research questions which substituted the hypothesis formulation. These research questions were then answered after gathering relevant data from the primary and secondary sources which were carefully selected, organized, and analysed.

In addition to the above, the researcher did not make use of observation and experimentation (as steps in scientific research), neither did he make any statistical analysis after gathering data, because it is not suitable in this type of research work. The researcher listened to some cassettes of Tafsir of some Qur'anic verses especially in Surah al-Muminun.

3.3 Broad Areas of Islamic Studies Research

Research in Islamic Studies differs to a greater extent with the western/modern scientific research. This is the reason why it is better to base Islamic Studies research according to the provisions of Qur'an, Hadith and Ijtihad. Muslim scholars

such as Imam Ghazali (d.1111 A.H) and Ibn Khaldun (d.808 A.H) classified the areas of research in Islamic Studies into three. These three areas as elaborated by Tukur (1999:192-194) include the following:

The first area deals with Fiqh and Usul al-fiqh which is otherwise called Islamic jurisprudence. These areas essentially deals with the interpretation of the Shari'ah and its precepts; such as issues related to Ahwal ash-Shakhsiyyah (Islamic personal Law), Ibádah (Islamic rituals related to the observance of prayer, fasting, payment of Alms, and going for pilgrimage to Makkah), etc

The second area of Islamic Studies research is called Usul al-Din, which is otherwise called Ilm al-Kalam or Tauhid. Those who complete their research in this field are called theologians. This area mainly deals with the Islamic belief systems, such as the six articles of faith: the belief in Allah and His attributes, belief in the Prophets and their messages. Others include belief in the Angels, belief in the hereafter and the events related to it, belief in scriptures and predestination

(the fortunes and misfortunes that happen to a Muslim), and other issues related to theology.

Hadith and civilization is the third area of research in Islamic Studies. The subjects that fall under this include Hadith Studies, Islamic History, Muslim Philosophy, Muslim Political thoughts, to mention but few.

Based on the categorization of scholars on the areas of research in Islamic Studies, it should be noted that this particular research relates to the second category explained above. This is because all that has been reviewed in chapter two relate to Usul al-Din. Anything that has to do with Qur'an and Apostolic traditions requires a Muslim to believe in them. The researcher quoted from two primary sources of Islam to substantiate what were reviewed in chapter two of this research work.

3.4 Visitation

The researcher conducted rigorous Library research to tap data used in writing the research report. The Libraries visited included Kashim Ibrahim Library (K.I.L) of A.B.U, Centre for Islamic Legal Studies Library (C.I.L.S), Congo

Campus, A.B.U, Zaria, Federal College of Education (F.C.E), Zaria Library, Bayero University, Kano (B.U.K.) Library, National Animal Production Research Institute (NAPRI) Library, Shika-Zaria and Division of Agricultural Colleges (DAC) Library, A.B.U. Zaria.

Some books were also purchased in some Friday Mosques, such as Emir of Zazzau's palace Mosque, late Alhaji Haruna Danja Mosque, as well as Sultan Bello Mosque in Kaduna. The researcher also visited some markets for the same purpose, among which include Kasuwan Kurmi market, Kano, Sabon gari Zaria Market ,etc.

In addition, some data were obtained at cyber cafés and from individual lecturers at Bayero University, Kano, F.C.E, Zaria, A.B.U. Zaria, to mention but few institutions.

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CHAPTER FOUR

ANALYSIS ON THE COMPATIBILITY OF ECOSYSTEM AND QUR'AN AND OTHER ASPECTS OF SCIENCE

4.0 Introduction

The researcher reviewed Literature in chapter two on different aspects of Life science, which consist of human and animal evolution, embryology, and some aspects of plant science. In this chapter, the researcher would like to analyse the compatibility of the ecosystem and Glorious Qur'an, some areas portraying the relationship between Qur'an and science, what influenced Muslims to study science and the relevance of studying Life Science to the Muslims.

4.1 Definition of Ecosystem and its Components

All living things created by Almighty Allah (SWT) interact with one another and the physical environment in which they live. In other words, one thing influences the other in matters of growth, development, and character. Naturally, interaction occurs between plants or animals, and between animals and their physical environment. These interactions cannot be possible without certain steps and processes. It is this

interaction through steps and processes that leads to the construction of what is called system. What then is ecosystem? The word ecosystem is defined in many ways.

Areola *et al* (1978:195) defines ecosystem as any system that involves the interaction between living things and the natural environment. It is otherwise called ecological system.

According to Vidyarthi *et al* (1978:894), an ecosystem is an ecological unit comprising of both the biotic (living) and abiotic (non-living) factors of the environment.

In a more simple definition, Balarabe (2010) sees ecosystem as communities of organisms which interact among themselves and with the non-living components of the environment so as to form a self-sustaining system that is dynamic.

4.1.1 Biotic Component of Ecosystem

Biologists such as Odunfa (1983:159) and Tatlor *et al* (1997:300-303) have categorized ecosystem into two major components: the biotic component (which consists of all living organisms) and the abiotic component (which comprise of the non-living components of the environment). The biotic

component of ecosystem mainly consists of plants and animals. They are categorized into the following:

a. Producers in Ecosystem

Plants are regarded as important members of ecosystem and are called autotrophs (self nourishing organisms). They obtain their food from organic sources (e.g green plants or inorganic sources like chemosynthetic bacteria or inorganic bacteria). Examples of these producers include the green plants such as grasses, trees, algae. The life of all other organisms depends on the plants, hence plants are regarded as producers. Areola *et al* (1992:196) and Vidyarthi *et al* (1978:895).

The growth of plants as previously explained in chapter two depends on the light of the sun. Tatlor *et al* (1997:197) maintains that, plants specialized in using light energy to carry out photosynthesis and contain pigments including chlorophyll which absorb the sun light. This photosynthesis is very vital, in that almost all life on earth depends on it, directly or in directly. It is this photosynthesis that makes both carbon and energy available to all living organisms and produces the

oxygen in the atmosphere, which is very important for all aerobic forms of life.

b. Consumers in Ecosystem

Vidyarthi (1978:895) states that the consumers are the animals or other members of the ecosystem that consume the food produced by the producers (plants). In this regard, animals are categorized into three on the basis of what they consume. Some animals depend on green plants to obtain their food and they are called herbivores. Animals such as goat, deer, and rabbit are good examples of the herbivores and are regarded as the primary consumers. Moreover, the crustacean, protozoon, molluscs that feed on algae in ponds, rivers and seas as well as insects, rodents, ruminants are also good examples of herbivores on the land.

Areola *et al* (1992:196) further explained that the carnivorous animals are the second type of consumers, which get their food from the flesh of herbivores and other carnivores like themselves. Animals that fall under this group include frogs, birds, grasshopper, hyena, wolf, lions, etc.

The last category of consumers in ecosystem are the omnivores. They feed on both plants and animals. For instance man is good example of omnivores, because he gets food from plants and also consumes the flesh of so many animals, to obtain nourishment and energy.

c. Decomposers in Ecosytem

It has been explained above that plants are the source of food for the consumers (animals). In other words, the life of animals depends on the food they obtain from plants. If the consumers whether herbivores, carnivores or omnivores take food from their normal source, they get energy which is then passed around within the community of living things in the ecosystem. Areola *et al* (1978:196) highlighted that, this results into flow of energy in the ecosystem, otherwise called food chain. This clearly indicates that the only way by which energy flows through the ecosystem is through food chain.

It is important to state that the ecosystem is a continuous cycle. This means that the interaction between members of ecosystem and their environment is repeatedly made. The Almighty Allah draws our attention to the fact that

the nutrition of every creature is in His hands. This is attested to in the following verse:

﴿ وَمَا مِن دَآبَّةٖ فِي ٱلۡأَرۡضِ إِلَّا عَلَى ٱللَّهِ رِزۡقُهَا وَيَعۡلَمُ مُسۡتَقَرَّهَا وَمُسۡتَوۡدَعَهَاۚ كُلّٞ فِي كِتَٰبٖ مُّبِينٖ ٦ ﴾

And there is no creature on earth but that upon Allah is its provision, and He knows its place of dwelling and place of storage. All is in clear register.

(Hud, 11:6)

The word animal used in the above verse include all created beings placed on earth. The food of every creature is already budgeted by Almighty Allah even before the creation of that animal.

One interesting question that can be asked on ecosystem is this: what happens to the remains of the consumers? The remains of plants and animals according to Areola *et al* (1992:196) are deposited on the surface of the soil. As they remain there, microorganisms in the soil decompose them and the energy locked up in them is released back into the environment. This is the reason why micro-organisms are called decomposers. Bacteria and fungi are good examples of micro-organisms.

4.1.2 Abiotic Component in Ecosystem

The abiotic component of the ecosystem refers to the environmental conditions that contribute in one way or the other, to the survival of the members of the biotic components. For example, it has been explained that all members of the ecosystem utilize energy and that this energy is very significant to their existence, growth, and survival. It is important to know: how do members of the ecosystem get their energy it? Tatlor *et al* (1997:299) defines energy as the ability to do work. According to them, all living organisms can be compared to machines, due to the fact that they need energy to keep working and stay alive. Energy links every object and every part of the earth together.

According to Encyclopaedia Britannica (2008:20), energy is cycled through food chains, and a basic link to this are the plants. It is during photosynthesis that plants trap light energy and store it as chemical energy. Herbivores then consume that energy and use it to grow and reproduce. Herbivores, in turn, are the primary energy source for carnivores. In this cycle also, algae play an important role

because they also undergo photosynthesis and serve as an important source of food for herbivores, particularly aquatic organisms. In the absence of algae and plants, there is tendency that all organisms would soon run short of food.

More over, in the nutrient cycle of ecosystems, algae and plants play an important role. In order to build their own tissues, they both take in carbondioxide and use it. It is when vegetation is eaten that this organic carbon is converted to animal tissue. When the animal tissue is utilized or oxidized in respiration, during which carbondioxide is released into the air, where it is again made available for photosynthesis. Biologists call this exchange "the carbon cycle" (Encyclopedia Britannica, 2008:20).

The above explanation clearly indicates the powerful nature and will of Almighty Allah on His creations. He is the only One Who created the sun and gives it energy that is utilized by members of the ecosystem on earth. No creature will ever be able to change it. Allah ordained certain things to happen according to His laws in order to serve as a sign for those who are thoughtful in His creations. This is the reason

why so many verses of the Glorious Qur'an end with questions such as don't you reflect? Don't you reason? Don't you understand? etc.

4.2.1 The Sun

The sun is a typical self luminous star composed of hydrogen and helium. Anis-u-deen (n.d:99) states that the sun is about 865, 000 miles in diameter and 330,000 times heavier than the earth. The Glorious Qur'an recognizes the value of the sun where it says:

﴿ وَجَعَلْنَا سِرَاجًا وَهَّاجًا ﴿١٣﴾ ﴾

And made therein a burning lamp.

(an-Naba, Q78:13)

According to the above verse, the sun serves as a source of light during day time to help us perform our daily activities. In addition to this, the light of the sun gives heat, which is very important to our plants. It is the heat energy of the sun that is converted into various forms of energy needed in the ecosystem. The sun therefore is very important to the life of all creatures on earth.

The sun and moon as indicated in the Qur'an move according to different orbits. On this, the Almighty Allah says:

﴿ لَا ٱلشَّمْسُ يَنۢبَغِى لَهَآ أَن تُدْرِكَ ٱلْقَمَرَ وَلَا ٱلَّيْلُ سَابِقُ ٱلنَّهَارِ ۚ وَكُلٌّ فِى فَلَكٍ يَسْبَحُونَ ﴿٤٠﴾ ﴾

It is not allowable (i.e, possible) for the sun to reach the moon, nor does the night overtake the day, but each in its orbit is swimming.

(Yasin, Q36:40)

Recognition is made in the above verse on the orbits of the sun and moon. Another important thing stated in the verse is that, the two orbits travel in space on their own orbit. This is compatible to the discovery of modern astronomers. In his contribution on this fact, Bucaille (1986:162) explains that indication is not given as to the nature of the orbit in relation to the earth. The idea of the Arabs at the time of Qur'anic revelation was that the sun moved and the earth stood still.

To further illustrate the meaning of the above verse on the orbits of the sun and moon, Naik (2001:15) highlights that, the sun travels through space within every second at roughly 150 miles. It also takes about 200 million years to complete one revolution around the centre of our milky way galaxy. It

takes the sun 25 days to rotate around its axis. As for the moon, it takes 29 ½ days to complete rotation around its axis or complete one rotation.

The Almighty Allah created the sun and moon and no one has ever seen the sun during the night, or the moon in the day time, and they do not clash with each other. It is very rare to find the sun and moon moving on the same path. When they move on the same path and in a line with the earth, there is bound to be solar eclipse. If they happen to be on opposite sides in a line, it will result to lunar eclipse (Ali, 1983:1179).

Modern astronomers have made the same observation regarding the eclipse of the sun and the moon. Emeilu (n.d:129-130) for example maintains that, due to the revolution of the moon round the earth and the earth round the sun, it at times happen that all the three are on straight line. As a result of this, the ray from the sun is covered from reaching either the earth or the moon. This phenomenon is called an eclipse. This occurs when the moon comes between the earth and the sun in a perfect straight line, this results into the moon blocking off the ray of the sun. The moon then

casts its shadow on the earth. When this happens, it is called solar eclipse or eclipse of the sun. On the other hand, when the earth comes in between the sun and the moon, because of the earth's size, being bigger than the moon, it can completely cover the ray of the sun from reaching the moon. When this happens, it is called lunar eclipse or eclipse of the moon.

4.1.2.2 The Hydrosphere:

The second basic component of the ecosystem under abiotic component relates to water in the oceans, lakes, rivers, etc. This is other wise called the hydrosphere. Water as we all know is very valuable to the life of all living organisms. In fact, life is entirely connected to water; as explained in chapter two. It has been indicated also that, the origin of all human beings and animals is water, and that the importance of sending down rain for the benefit of living organisms is in order to sustain their lives and to serve many other purposes. Added to these, some of the sources of water like rivers, seas, oceans and their importance were also discussed in chapter two by quoting relevant verses.

Some of the wonderful nature of the Qur'an as stated before, is its ability of maintaining scientific facts in 7th century C.E, now confirmed by modern scientists through research. One example is that, the Qur'an places more importance on the environment we live in and the sea that Allah (SWT) created. The word sea otherwise called *Bahr* in Arabic has appeared 32 times in the Qur'an and the word land, which is an equivalent word for al-Bar has appeared 13 times. When the total number of the two words are added together, it gives the sum of 45. When 32 is divided by 45 and multiplied by 100, the percentage will be 71.11%. In the second case as portrayed by Lawal (2007:20), if the total number of frequencies of the use of the word land in the Qur'an, which is 13 divided by 45 and multiplied by 100%, the percentage will be 28.89%. If the two percentages are summed up together, 100% will be their total. This is clearly one of the scientific miracles of the Qur'an, further portrayed by the fact that scientists have found that the surface of the globe is covered by 71% water and 29% land. Can this happen by coincidence or chance? The fact that the surface of the earth

covered by 71% of water is attested to by geographers. For example, Areola *et al* (1978:87) maintains that the seas, lakes, oceans and rivers cover about three quarter of the earth's surface.

What connects water and members of the ecosystem? The answer to this question is simple. As explained before, ecosystem has to do with the interaction between living organisms and the environment and that this interaction is continuous in nature. The relationship between water and other members of the ecosystem is that the consumers whether herbivores, carnivores or omnivores greatly need water in order to survive, for without water, there is no life completely. Almighty Allah says:

﴿ هُوَ ٱلَّذِىٓ أَنزَلَ مِنَ ٱلسَّمَآءِ مَآءً لَّكُم مِّنْهُ شَرَابٌ وَمِنْهُ
شَجَرٌ فِيهِ تُسِيمُونَ ﴿١٠﴾ يُنۢبِتُ لَكُم بِهِ ٱلزَّرْعَ
وَٱلزَّيْتُونَ وَٱلنَّخِيلَ وَٱلْأَعْنَٰبَ وَمِن كُلِّ ٱلثَّمَرَٰتِ ۗ إِنَّ
فِى ذَٰلِكَ لَءَايَةً لِّقَوْمٍ يَتَفَكَّرُونَ ﴿١١﴾ ﴾

It is He Who sends down rain from the sky; from it is drink and from it is foliage in which you pasture (animals). He causes to grow for you thereby the crops, olives, palm trees, grapevines and from all the fruits.

Indeed, in that is a sign for people who give thought.
(an-Nahl, Q16:10-11)

In another verse, He again says:

﴿ وَٱللَّهُ أَنزَلَ مِنَ ٱلسَّمَآءِ مَآءً فَأَحْيَا بِهِ ٱلْأَرْضَ بَعْدَ مَوْتِهَآ ۚ إِنَّ فِى ذَٰلِكَ لَءَايَةً لِّقَوْمٍ يَسْمَعُونَ ﴿٦٥﴾ ﴾

And Allah has sent down rain from the sky and given life thereby to the earth after its lifelessness. Indeed, in that is a sign for a people who listen.
(an-Nahl, Q16:65)

The first verse above indicates that, Allah sends down rain from the sky for the use of human beings. The vegetation that is used in feeding animals, such as goats, sheep, cows, etc grow as a result of the presence of water. In addition, the food we eat be them fruits, vegetables or grains are only obtainable as a result of rain, or irrigation. In a nutshell, both the producers and consumers need water which is a member of the abiotic component of the ecosystem.

4.1.2.3 The Atmosphere (Air)

In order to understand the nature of the atmosphere, it should be borne in mind that our planet is made up of some concentric shells of different materials which are arranged

according to increasing density and depth. In the atmosphere also, there are some concentric shells that are found above the surface of the earth, but associated with it (Anis-u-deen, n.d:51) and Wadud (1982:17-18). The atmosphere has seven layers, as attested in the Qur'an where Allah states:

﴿ ٱللَّهُ ٱلَّذِى خَلَقَ سَبْعَ سَمَٰوَٰتٍ وَمِنَ ٱلْأَرْضِ مِثْلَهُنَّ يَتَنَزَّلُ ٱلْأَمْرُ بَيْنَهُنَّ لِتَعْلَمُوٓا۟ أَنَّ ٱللَّهَ عَلَىٰ كُلِّ شَىْءٍ قَدِيرٌ وَأَنَّ ٱللَّهَ قَدْ أَحَاطَ بِكُلِّ شَىْءٍ عِلْمًا ﴿١٢﴾ ﴾

It is Allah Who has created seven heavens and of the earth, the like of them. (His) command descends among them, so you may know that Allah is over all things competent and that Allah has encompassed all things in knowledge.

(at-Ṭalaq, Q65:12)

The word 'samawat', is a plural of 'sama' meaning heaven, that is a higher direction above the earth. It is in the heaven that the clouds move about before the rain falls, the sun is fixed and the stars are placed.

The heavens are created in such a way that one is covering the other like onion shells. Right from the time of its creation, no one has ever seen the heaven falling down or

having some rifts. If a person stands in whatever place, he will realise that the heaven covers that particular area, as if being spherical. The more a person walks on earth or travels in cars, the more he will find the heaven being extended. In other words he will hardly reach the place where the heaven ends. This is clearly showing the power and majesty of Almighty Allah.

Allah has mentioned in the Qur'an that He has created for us seven heavens and seven earths, for some purposes.

The seven atmospheric layers according science as highlighted by al-Khader (2005:618-619) and Lawal (2007:39) comprise of the following:

1. **Troposphere**: This layer contains oxygen which helps in the sustenance of life on earth. It has also clouds which helps in giving rain to the earth for the provision of food. It extends up to 14km above the earth surface.
2. **Stratosphere**: This layer extends from 25km to 80km. it reflects and turns back harmful radiation and ultraviolet ray coming from space back into space. The effects of

weather on the earth are not usually felt at the lower boundary of this layer.

3. **Ozonosphere**: It is this layer that turns cosmic rays that are harmful, such as ultra violet ray back to space. It prevents them from reaching our earth.
4. **Mesosphere**: This layer is about 50-85km and it is above the ozonosphere.
5. **Thermosphere**: This layer is about 85-500km and it is fixed between ionosphere and mesosphere.
6. **Ionosphere**: It is the layer that helps to reflect the waves of radio broadcast from a certain centre back to the earth. It is by this that the broadcast of radio is received, from long distances. This layer extends for about 250 miles above the earth surface.
7. **Exosphere**: This layer is more than 500km and is the last layer of the atmosphere. It decreases the air density to null.

The above atmospheric layers are not the same as the seven heavens, because none can say how they are, as they are beyond our conception and perception. Scientists can only

travel to the moon, but they cannot penetrate through the heavens.

There is need at this juncture to ask: What is the relationship between members of ecosystem and the atmosphere? Any explanation about atmosphere can never be complete without linking it to the saying of Allah in the Qur'an:

﴿ إِنَّ فِي خَلْقِ ٱلسَّمَٰوَٰتِ وَٱلْأَرْضِ وَٱخْتِلَٰفِ ٱلَّيْلِ وَٱلنَّهَارِ وَٱلْفُلْكِ
ٱلَّتِي تَجْرِي فِي ٱلْبَحْرِ بِمَا يَنفَعُ ٱلنَّاسَ وَمَآ أَنزَلَ ٱللَّهُ مِنَ ٱلسَّمَآءِ مِن مَّآءٍ
فَأَحْيَا بِهِ ٱلْأَرْضَ بَعْدَ مَوْتِهَا وَبَثَّ فِيهَا مِن كُلِّ دَآبَّةٍ وَتَصْرِيفِ
ٱلرِّيَٰحِ وَٱلسَّحَابِ ٱلْمُسَخَّرِ بَيْنَ ٱلسَّمَآءِ وَٱلْأَرْضِ لَءَايَٰتٍ لِّقَوْمٍ يَعْقِلُونَ
﴿١٦٤﴾ ﴾

Indeed, in the creation of the heavens and the earth, and in the alternation of the night and the day and the (great) ships which sail through the sea, with that which benefits people, and what Allah has sends down from the heavens of rain, giving life thereby to the earth after its lifelessness and dispersing therein every (kind) of moving creature, and (His) directing of the winds and the clouds controlled between the heaven and earth are sigs for a people who use reason. (al-Baqarah, Q2:164)

The above verse explains that, the wind is very important in the formation of cloud and it is after the cloud is formed that we have rain, being one of the sources of water. Allah (SWT) sends the wind to us for different purposes. Ibn Kathir (2003:458-459) states that sometimes it brings mercy and sometimes torment. Sometimes it brings the good news of the clouds that follow it and sometimes it leads the clouds by herding them, scattering them or directing them. The wind sometimes comes from the north and sometimes from the south and it may come sometimes from east or west. The wind may be hot or cold, depending on how Allah wishes. The verse also indicates that the clouds are being moved by the command of Allah to the place He wills. The angels are being directed to push the clouds to different places where they are converged before they form to give rain. The veering of the wind and movement of the clouds are all showing or testifying the oneness of Allah (SWT), Who Alone is worthy of worship.

The importance of air to human beings, animals and aquatic lives cannot be estimated, as it contains gasses that are very essential for them. Air is important in that it helps in

the production of food, and its preservation. In transportation and communication sectors, air is also very essential. Aeroplanes for example, move in space by using air.

4.1.2.4 The Lithosphere

Lithosphere consists of the outer layers of the solid earth, rocks, sediments and soil. The lithosphere has two different parts, including upper part which is made up of granite rocks and forms the continent. The second (lower part) is a continuous zone of denser basaltic rocks which form the ocean floors. (Areol *et al*, 1992:18).

The earth, one of the major components of the sky and heavens is mentioned 320 times in the Qur'an (Lawal, 2007:44). The purpose of creating the earth is clearly indicated in the Qur'an where Almighty Allah says:

﴿ ٱلَّذِى جَعَلَ لَكُمُ ٱلْأَرْضَ مَهْدًا وَجَعَلَ لَكُمْ فِيهَا سُبُلًا لَّعَلَّكُمْ تَهْتَدُونَ ﴿١٠﴾ ﴾

(The one) Who has made for you the earth a bed, and made for you upon it roads that you might be guided.

(al-Zukhruf, Q43:10)

Allah indicates in the above verse that, the earth provides rest and freedom of movement. Transportation is carried out through various routes of the earth by land and sea. Various land marks guide man by providing him directions by the day time. As for the night journey, the stars helps a lot. The Qur'an says:

﴿ وَهُوَ ٱلَّذِى جَعَلَ لَكُمُ ٱلنُّجُومَ لِتَهْتَدُوا۟ بِهَا فِى ظُلُمَٰتِ ٱلْبَرِّ وَٱلْبَحْرِ ۗ
قَدْ فَصَّلْنَا ٱلْءَايَٰتِ لِقَوْمٍ يَعْلَمُونَ ﴿٩٧﴾ ﴾

And it is He Who placed for you the stars that you may be guided by them through the darknesses of the land and sea. We have detailed the signs for a people who know.

(al-An'am, Q6:97)

The Glorious Qur'an is not a book of science, yet it contains some facts that corroborate what modern science has established. For example, the Qur'an tells us that the earth is round in shape and in another verse it says that it is more like an egg:

﴿ وَٱلْأَرْضَ بَعْدَ ذَٰلِكَ دَحَىٰهَآ ﴿٣٠﴾ ﴾

And after that He spread the earth.

(an-Nāzi'at, Q79:30)

Allah (SWT) made mention of His creating the earth in the above verse. Commentators of the Qur'an such as Ibn Kathir (2003:349-350) and al-Mahalli *et al* (1431A.H:1692)

explained that Allah (SWT) created the earth before the heaven. The earth was spread out after the creation of the Heaven. Spreading out the earth means that Almighty Allah brought out what was in it with a forceful action, according to Ibn Abbas (d.68A.H). This meaning was also preferred by Ibn Jarir at-Ṭabari (d.310A.H/923C.E).

4.1.2.5 The Earth and Its Rotation

According to Anis-u-deen (n.d:20), the earth completes one rotation about its axis in 23 hours and 56 minutes, roughly 24 hours. Because of this rotation, one half faces the sun, and will be in day time and the other half is in darkness. As for the revolution of the earth, it takes 365 days, 6 hours 46 minutes and 48 seconds to make a complete one around the sun. The rotation, revolution and inclination of the earth on its axis that causes the changes of seasons, is recognized in the Qur'an as follows:

﴿ وَءَايَةٌ لَّهُمُ ٱلَّيۡلُ نَسۡلَخُ مِنۡهُ ٱلنَّهَارَ فَإِذَا هُم مُّظۡلِمُونَ ﴿٣٧﴾ ﴾

And a sign for them is the night. We remove from it the (light of) day, so they are left in darkness.

(Ya sin, Q36:37).

The alternation of night over the day and vice-versa is the work of Almighty Allah. That is why in verse 164 of Suratul Baqarah, which relate to this subject, Allah mentions that in the creation of the skies, and earth, the ships that move on in the sea are signs of Allah's existence which is pondered upon by people who reflect on the wonderful creations of Almighty Allah. The Qur'an further states:

﴿ قُلْ أَرَءَيْتُمْ إِن جَعَلَ ٱللَّهُ عَلَيْكُمُ ٱلنَّهَارَ سَرْمَدًا إِلَىٰ يَوْمِ
ٱلْقِيَٰمَةِ مَنْ إِلَٰهٌ غَيْرُ ٱللَّهِ يَأْتِيكُم بِلَيْلٍ تَسْكُنُونَ فِيهِ ۖ أَفَلَا
تُبْصِرُونَ ﴿٧٢﴾ ﴾

Say, "Have you considered; if Allah should make for you the day continuous until the day of Resurrection, what deity other than Allah could bring you a night in which you may rest.? Then will you not see?.

(al-Qasas, Q28:71).

A thought provoking question has been asked in the above verse to mankind. Allah asked the question in the verse to enable us use our intellect to understand that the day and night are for our benefit. We seek our means of (livelihood) in the day time when the sun illuminates and in the night, we

rest (by sleeping). He did not create the day time continuously, neither did He make the night in a perpetual order. This is a great blessing to us. If the night is made to be perpetual, no scientist or any other creature will be able to change it to day time, and vice-versa.

The creation of night and day are two signs of Allah that are very important especially to the Muslims who remember His greatness in His creation, as attested in the following verse:

﴿ وَجَعَلْنَا ٱلَّيْلَ وَٱلنَّهَارَ ءَايَتَيْنِ فَمَحَوْنَآ ءَايَةَ ٱلَّيْلِ وَجَعَلْنَآ
ءَايَةَ ٱلنَّهَارِ مُبْصِرَةً لِّتَبْتَغُوا۟ فَضْلًا مِّن رَّبِّكُمْ وَلِتَعْلَمُوا۟
عَدَدَ ٱلسِّنِينَ وَٱلْحِسَابَ ۚ وَكُلَّ شَىْءٍ فَصَّلْنَٰهُ تَفْصِيلًا ﴿١٢﴾ ﴾

And We have made the night and day two signs, and We erased the sign of the night and made the sign of the day visible that you may seek bounty from your Lord and may know the number of years and the account (of time); And everything We have set out in detail.

(al-Isra'i, Q17:12).

It is clear from the above verse that, Allah darkens the night and make the day to be visible. It is when the sun sets

that we begin to experience the beginning of night and when fajr (dawn) light begins to appear, we experience the beginning of our day time, when the activities of the earth begin. Through His wisdom, the night has 12 hours and the day also has equal number of hours. There has never been a time when the whole world experience night (plunged into darkness) and or happened to be in the day time throughout. While some countries are in the day time, others will be in the night. This all depends on the movement of the earth and its inclination to its axis.

According to modern geographers as pointed by Areola *et al* (1978:5) the rotation of the earth on its axis causes one of its portion to come to the rays of the sun, which results in day light on a particular part of the earth. When this happens, the other portion which is away from the sun's rays will be in darkness.

Almighty Allah who created us and placed us on earth provided everything for our benefit, such as the heaven and earth, the day and night, the planetary bodies, and other things which are created in pairs. Through His wisdom, He

changes the night into day, and causes changes in our seasons. During the summer, for instance, there is much heat and brightness. Intensity of heat causes difficulty in our living condition. During the winter, there is much cold and darkness. There is great wisdom in the variation of the seasons. Allah does not make a particular season to be stationary, had it been so, much more difficulty would likely be experienced. This is the reason why some people prefer the summer time and others opt for the winter due to the nature of their body.

Thus, it is very important to ask this question: what causes changes in our seasons?. In his explanation on the changes of seasons, Wadud (1982:138-142) presents some reasons behind this. According to him, the inclination of the earth equator at $23\frac{1}{2}^0$ to the plane of its orbit and its keeping nearly the same direction in space during a complete revolution, each pole (part of the earth) is presented to the sun for part of the year, and for the remaining part is turned away from it. This cause the change in seasons. He further explains that, if the surface of the earth were perpendicular to the

plane of the earth's orbit, the sun would each day pass through the sky in the same way (path) and by implication there would be equal length of our days and when this happens there would be no changes in our seasons.

Another important cause of change in our season is due to the revolution of the earth. The earth revolves round the sun and this complete revolution takes 365¼ days or one year. If the axis of the earth were inclined, but there were no revolution, then by implication, the nights and days would not be 12 hours each and they would remain the same for any particular place, and for each day, the amount of heat received from the sun would still be the same and this means there would be no seasonal changes. The Qur'an in many verses pointed about the rotation of the earth, such as in the following:

﴿ خَلَقَ ٱلسَّمَٰوَٰتِ وَٱلْأَرْضَ بِٱلْحَقِّ يُكَوِّرُ ٱلَّيْلَ عَلَى ٱلنَّهَارِ وَيُكَوِّرُ ٱلنَّهَارَ عَلَى ٱلَّيْلِ وَسَخَّرَ ٱلشَّمْسَ وَٱلْقَمَرَ كُلٌّ يَجْرِى لِأَجَلٍ مُّسَمًّى أَلَا هُوَ ٱلْعَزِيزُ ٱلْغَفَّٰرُ ﴿٥﴾ ﴾

He created the heavens and earth in truth. He wraps the

> *night over the day and wraps the day over the night and has subjected the sun and the moon each running (its course) for a specified term. Unquestionably, He is the Exalted in Might, the Perpetual Forgiver.*
>
> (al-Zumar, Q39:5).

Commenting on the verse above, Al-Mahalli *et al* (1431A.H:1320) explained that Allah (SWT) causes the night and the day to replace each other (i.e if the day is gone, the night comes, and if the night is gone, the day comes, and so on). They further highlighted that Allah merges the night into the day, meaning that the decrease in the hours of the night are added in the hours of the day), and merges the day into the night (i.e the decrease in the hours of the day are added in the hours of night).

The above verse also portrays some of the powerful nature of Allah as regard to creation of the heavens and earth as well as how He changes the nights into days and vice-versa. It also points out how the sun and moon move on their orbit under the permission of their Creator.

One surprising thing that further clearly demonstrates the wonderful nature of Allah is the wonderful change of nights and days during summer and winter. During summer, the days are longer and nights shorter, but during winter, nights are longer than the days. Wadud (1982:142) highlights that, this depends on how the sun passes through the sky at a much higher elevation in summer than in winter. Due to higher elevation of the sun, it causes longer days. There would be more pronouncement of the change of seasons if the inclination of the earth's axis were more than 23½^0. If this happens, the summer times would be warmer and the winter colder than they are now.

Almighty Allah further draws our attention to ponder on what He created. The changes in our days and night clearly reveals His powerful nature. He makes the sun to be vertically overhead at the equator for two days each year – 21st March and 21st September, although the date changes because one year is not exactly 365 days. In these two days as explained by Areola *et al* (1978:6-7), there will be equal days and nights in all parts of the world. Geographers call this 'equinoxes' which

signifies equal nights. As a result of the movement of the sun towards north and its vertically overhead at the Tropic of Cancer (23½^{0}N) on about 21st June of every year, the northern hemisphere of the globe will have its longest day and shortest night. This is called the summer soltice. The sun will be overhead also at the tropic of Capricorn (23½^{0}S) by about 22nd December, as a result of which the southern hemisphere will have its longest day and shortest night. This is called winter soltice in geography. All these are enough to make a Muslim have stronger faith as regards to the signs of Almighty Allah.

4.1.2.6. Rocks and Mountains

Rock is an important component of the lithosphere. There are so many importance of rocks among which, according to Areola *et al* (1978:23-24) include the following:

(1) Some building materials are provided by rocks. In Nigeria for instance, granite (which is obtained from the rocks) is quaried and used for the decking of houses, construction of roads etc.

(2) The cement we use for building purposes is originally derived from limestone, chalk and clay which are sourced also from the rocks.

(3) The fuel we use are derived from some rocks. The vital sources of fuel include steam, coal, lignite, anthracite, mineral oils (petroleum), among others. Fuel, as is well known is one of the important source of economy in many countries such as Nigeria, Saudi-Arabia, Libya, to mention but few.

(4) Various precious metals like copper, gold, silver, tin, lead, and Zinc are sourced from some extremely rare rocks. We make use of these metals in producing so many things like wrist - watches, necklaces, and other golden materials used to decorate our houses, mosques, offices, etc.

(5)The source of water supply in some cases is connected to the nature of the rocks. We derive our drinking water in some cases by sinking wells to tap the sub-surface water that is naturally filtered when passing through the rocks.

What then relates members of the ecosystem with rocks? There is need to take into consideration the above importance of rocks in order to provide appropriate answer to the question asked. It has been explained previously that man and other animals are members of the ecosystem and are called consumers. The consumers need energy for them to properly function as members of ecosystem. Their life also to a greater extent depends on huge quantity of water, without which they cannot live at all. Part of the source of water they take to sustain their life comes from the rocks. This clearly means that the rocks are very important to the life of the consumers.

The Qur'an also shows that Allah created mountains in order to give stability to the earth crust. They have underlying roots which are deeply embedded on the ground. In other words, their shapes resemble a peg. These roots can reach height several times their elevations above the ground surface. Almighty Allah says:

﴿ أَلَمْ نَجْعَلِ ٱلْأَرْضَ مِهَٰدًا ۝٦ وَٱلْجِبَالَ أَوْتَادًا ۝٧ ﴾

Have We not made the earth as a resting place, and the mountains as stakes?.

(an-Naba', Q78:6-7).

It has been indicated in the above verse that mountains are created to serve as stabilizers of the earth as well as hindering the shaking of the earth. Explaining the importance of mountains, Anis-ud-deen (n.d:55-56) highlights that without them, the earth would continuously be unseable. Mountains also help in controlling the wind, rain, and the like. The function of mountains is also stated in another verse of the Qur'an:

﴿ وَأَلْقَىٰ فِي ٱلْأَرْضِ رَوَٰسِيَ أَن تَمِيدَ بِكُمْ وَأَنْهَٰرًا وَسُبُلًا لَّعَلَّكُمْ تَهْتَدُونَ ﴿١٥﴾ ﴾

And He has cast into the earth firmly set mountains, lest it shifts with you, and (made) rivers and roads, that you may be guided.

(an-Nahl, Q16:15).

The mountains as indicated above help to give balance to the earth. Without them, there would have been great problem that will affect the producers and consumers as members of the ecosystem.

The fact that mountains have pegs is backed up with Qur'anic verse above. This fact according to Ibrahim (1997:11-

13) is compatible with the data of modern science. Frank Press, one of the authors of a book on Geology named "Earth" explained that mountains have roots that is entrenched in the earth as shown above in Q16:15. This fact is also compatible with what was explained in the above book.

Allah (SWT) mentions in the verse (Q16:15) that He made routes or roads which are used by people during their travels from one land or a particular place to another. He also gives man the knowledge of how to make roads by himself. In modern time for instance, roads covering thousands of kilometers are constructed by government, through the supervision of some engineers. This is one of the aspects of social welfare that people enjoy from their respective governments. The values of roads to people cannot be overemphasized; in that our businesses, travels from a particular place to another are not possible without them.

As part of the blessings of the Creator, He has provided some land marks (great mountains, small hills, stars and other things) which greatly assist and guide the travelers to find their way when they get lost.

4.2 Analysis on Some Areas of Relationship between the Glorious Qur'an and Science

Science has been defined in chapter two. It encompasses knowledge as a whole, but specifically it refers to knowledge of nature. One important thing that needs to be mentioned before explaining how some Qur'anic verses relate to some scientific ideas of the modern time is the fact that the former was revealed to an unlettered Prophet (S.A.W) in the 7th century C.E. and the latter came into being between the 15th and 21st century C.E.

Almighty Allah in the Qur'an constantly call upon the believers and humanity at large to use their senses to perceive the beauty and how things are balanced in our own nature. He also calls on humanity to use their intellect so as to understand the design, order, and harmony in the universe. The Qur'an also poses some philosophical questions in some of its verses by ending with don't you reflect? Don't you ponder? The following verse clearly illustrates some of the signs of Almighty Allah regarding His creation in the universe:

﴿ إِنَّ فِي خَلْقِ ٱلسَّمَٰوَٰتِ وَٱلْأَرْضِ وَٱخْتِلَٰفِ ٱلَّيْلِ وَٱلنَّهَارِ وَٱلْفُلْكِ ٱلَّتِي تَجْرِي فِي ٱلْبَحْرِ بِمَا يَنفَعُ ٱلنَّاسَ وَمَآ أَنزَلَ ٱللَّهُ مِنَ ٱلسَّمَآءِ مِن مَّآءٍ فَأَحْيَا بِهِ ٱلْأَرْضَ بَعْدَ مَوْتِهَا وَبَثَّ فِيهَا مِن كُلِّ دَآبَّةٍ وَتَصْرِيفِ ٱلرِّيَٰحِ وَٱلسَّحَابِ ٱلْمُسَخَّرِ بَيْنَ ٱلسَّمَآءِ وَٱلْأَرْضِ لَءَايَٰتٍ لِّقَوْمٍ يَعْقِلُونَ ﴿١٦٤﴾ ﴾

Indeed, in the creation of the heavens and the earth, and in the alternation of the night and the day and the (great) ships which sail through the sea, with that which benefits people, and what Allah has sends down from the heavens of rain, giving life thereby to the earth after its lifelessness and dispersing therein every (kind) of moving creature, and (His) directing of the winds and the clouds controlled between the heaven and earth are signs for a people who use reason.

(al-Baqarah, Q2:164).

In another verse Allah draws our attention further:

﴿ أَلَمْ تَرَ أَنَّ ٱللَّهَ أَنزَلَ مِنَ ٱلسَّمَآءِ مَآءً فَأَخْرَجْنَا بِهِۦ ثَمَرَٰتٍ مُّخْتَلِفًا أَلْوَٰنُهَا وَمِنَ ٱلْجِبَالِ جُدَدٌۢ بِيضٌ وَحُمْرٌ مُّخْتَلِفٌ أَلْوَٰنُهَا وَغَرَابِيبُ سُودٌ ﴿٢٧﴾ ﴾

Do you not see that Allah sends down rain from the sky, and We produce thereby fruits of varying colors? And in the mountains are tracts white and red of varying shades and (some) extremely black.

(al-Fāṭir, Q35:27-28)

By going through the above two verses with utmost sincerity, one would use his intellect to deduce from them that the creation of the heavens and the earth, the changes of the

night and day, the sailing of ships in oceans, the sending down of rain, the change of the winds, the clouds and their formation are issues related to science. Geographers are quite aware of all these things related to the subject. The second verse which emphasized on the idea of sending down rain from the sky which leads to the growth of various produce with different colours relates to Biological and Agricultural Science. The idea of mountains relates to Geography. This has been explained in chapter two and four. The existence of men and crawling creatures in various colours and shapes, which clearly indicate the Greatness of Our Creator relate to Biological Science. The Qur'an further states:

﴿ إِنَّ فِي خَلْقِ ٱلسَّمَٰوَٰتِ وَٱلْأَرْضِ وَٱخْتِلَٰفِ ٱلَّيْلِ وَٱلنَّهَارِ لَءَايَٰتٍ
لِّأُو۟لِى ٱلْأَلْبَٰبِ ﴿١٩٠﴾ ٱلَّذِينَ يَذْكُرُونَ ٱللَّهَ قِيَٰمًا وَقُعُودًا وَعَلَىٰ جُنُوبِهِمْ
وَيَتَفَكَّرُونَ فِي خَلْقِ ٱلسَّمَٰوَٰتِ وَٱلْأَرْضِ رَبَّنَا مَا خَلَقْتَ هَٰذَا بَٰطِلًا
سُبْحَٰنَكَ فَقِنَا عَذَابَ ٱلنَّارِ ﴿١٩١﴾ ﴾

Indeed, in the creations of the heavens and the earth and the alternation of the night and the day are signs for those of understanding. Who remember Allah while standing or sitting or (lying) on their sides and give thought to the creation of the heavens and the earth, (saying), "Our Lord, You did not create this aimlessly;

exalted are You (above such thing). Then protect us from the punishment of fire.
(Ali-Imran, Q3:190-191).

The above verse clearly point out that men should use their God-given faculties to ponder on the creation of the heavens and earth, night and day, and other things. They should understand that everything created by Allah is meant to serve some purposes and not that they exist in vain. This verse has an element of relationship with science which also require men of understanding, to observe, to deduce and make some logical thinking before arriving at answers. Without these, no one would be a good man of thought. Anybody who meditates deeply and thinks profoundly about his creation and the creation of natural phenomena according to the above verse is considered as man of knowledge. The following things further show the nature of relationship between Qur'an and science:

4.2.1 Origin of the Universe

The Glorious Qur'an describes the origin of the universe on a very broad basis where it says:

﴿ أَوَلَمْ يَرَ ٱلَّذِينَ كَفَرُوٓا۟ أَنَّ ٱلسَّمَٰوَٰتِ وَٱلْأَرْضَ كَانَتَا رَتْقًا فَفَتَقْنَٰهُمَا ۖ وَجَعَلْنَا مِنَ ٱلْمَآءِ كُلَّ شَىْءٍ حَىٍّ ۖ أَفَلَا يُؤْمِنُونَ ﴿٣٠﴾ ﴾

Have those who disbelieved not considered that the heavens and the earth were a joined entity, and We seperated them and made from water every living thing? Then will they not believed?.

(al-Anbiya, Q21:30)

Allah draws the attention of the unbelievers to understand the fact that the heavens and the earth were initially a single unit of creation and they were later separated (fataq) into segments, and they formed galaxies, out of which they became divided into planets, the moon, the sun, the stars, etc. This explanation is complementary to what the modern scientists (astronomers) said, that there was big-bang and as a result of which the universe became separated into some segments.

Almighty Allah also says:

﴿ ثُمَّ ٱسْتَوَىٰٓ إِلَى ٱلسَّمَآءِ وَهِىَ دُخَانٌ فَقَالَ لَهَا وَلِلْأَرْضِ ٱئْتِيَا طَوْعًا أَوْ كَرْهًا قَالَتَآ أَتَيْنَا طَآئِعِينَ ﴿١١﴾ ﴾

Then He directed Himself to the heaven while it was smoke and said to it and to the earth, "come into being, willingly or by compulsion". They said: "we have come willingly".

(al-Fussilat, Q41:11)

The above verse explains that the earth and other heavenly bodies like the sun, the galaxies, the moon, the planets and the stars were formed from 'the smoke' mentioned. This means that the earth and the heavens were one connected entity, but later they became separated from each other after their formation from the homogeneous smoke.

Ibrahim (1997:14) highlights on the origin of the universe as explained by scientists (cosmologists) who maintain that at one point in time, the whole universe was nothing but a cloud of smoke. The fact can never be disputed as far as the principles of standard modern cosmology is concerned. Out of the reminants of that smoke, scientists now can observe new stars forming out of it.

Considering the compatible nature of science and Qur'an on the origin of the universe, a reknowned geologist in the world Dr. Alfred Kroner, the chairman of the Department of Geology, Institute of Geosciences, Johannes Gutenberg University, Mainz Germany said:

> Thinking where Muhammad (S.A.W) came from - - - I think it is almost impossible that he could have known about things like the

common origin of the universe, because scientists have only found out within the last few years, with very complicated and advanced technological method, that this is the case.

He also said:

Somebody who did not know something about nuclear physics fourteen hundred years ago could not, I think, be in a position to find out from his own mind, for instance that the earth and the heavens had the same origin.

4.2.2 Formation of Cloud.

Before the advent of modern science, the Qur'an explained in the 7th century how cloud is formed:

﴿ أَلَمْ تَرَ أَنَّ ٱللَّهَ يُزْجِى سَحَابًا ثُمَّ يُؤَلِّفُ بَيْنَهُۥ ثُمَّ يَجْعَلُهُۥ رُكَامًا فَتَرَى
ٱلْوَدْقَ يَخْرُجُ مِنْ خِلَٰلِهِۦ وَيُنَزِّلُ مِنَ ٱلسَّمَآءِ مِن جِبَالٍ فِيهَا مِنۢ بَرَدٍ فَيُصِيبُ بِهِۦ
مَن يَشَآءُ وَيَصْرِفُهُۥ عَن مَّن يَشَآءُ ۖ يَكَادُ سَنَا بَرْقِهِۦ يَذْهَبُ بِٱلْأَبْصَٰرِ ﴿٤٣﴾ ﴾

Do you not see that Allah drives clouds? Then He brings them together, then you He makes them into a mass, and you see the rain emerge from within it. And He sends down from the sky mountains (of clouds) within which is hail, and He strikes with it whom He wills. The flash of its lightning almost takes away the eye sight.

(an-Nur, Q24:43).

Cloud, being one of the natural phenomena is very important, as far as rainfall is concerned. According to Geographers, it is the wind that pushes the cloud. The

formation of cumulonimbus cloud begins when the wind pushes a small piece of (cumulus clouds) to an area where it converges. Thereafter, the small cloud merged together to form a larger cloud.

Ibrahim (1997:24) explains the idea of stacking expressed in the above verse when he said that updrafts within the larger cloud increase when the small clouds are joined together. The updrafts near the middle part of the cloud are more stronger than those at its edges. The cloud body grow vertically as a result of the updrafts, which become stacked. 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.

Related to cloud, there is another verse which speaks of hail and lightning which says:

﴿ أَلَمْ تَرَ أَنَّ ٱللَّهَ يُزْجِى سَحَابًا ثُمَّ يُؤَلِّفُ بَيْنَهُۥ ثُمَّ يَجْعَلُهُۥ رُكَامًا فَتَرَى
ٱلْوَدْقَ يَخْرُجُ مِنْ خِلَٰلِهِۦ وَيُنَزِّلُ مِنَ ٱلسَّمَآءِ مِن جِبَالٍ فِيهَا مِنۢ بَرَدٍ فَيُصِيبُ بِهِۦ
مَن يَشَآءُ وَيَصْرِفُهُۥ عَن مَّن يَشَآءُ ۖ يَكَادُ سَنَا بَرْقِهِۦ يَذْهَبُ بِٱلْأَبْصَٰرِ ﴿٤٣﴾ ﴾

Do you not see that Allah drives clouds? Then He brings them together, then you He makes them into a mass, and you see the rain emerge from within it. And He sends down from the sky mountains (of clouds) within which is hail, and He strikes with it whom He wills. The flash of its lightning almost takes away the eye sight.

(an-Nur, Q24:43).

There are two issues mentioned in the above verse that relate to meteorology (an aspect of Geography). According to the findings of meteorologists, the cumulonimbus clouds that shower hail reach a height of 25,000 to 30,000 feet which is the same as 4.7 to 6.7 miles like mountains according to Ibrahim (1997:25). The idea of the formation of cloud, its structure and function, the hail and lightning were discovered recently by meteorologists by using advanced equipment like ballons, computers, plates, satellites and others. The lightning mentions in the above verse is produced by hail.

4.2.3 The Nature of Moon's Light

The Qur'an mentions about the orbit of the moon and sun in the following verse:

﴿ وَهُوَ ٱلَّذِى خَلَقَ ٱلَّيْلَ وَٱلنَّهَارَ وَٱلشَّمْسَ وَٱلْقَمَرَ ۖ كُلٌّ فِى فَلَكٍ يَسْبَحُونَ ﴿٣٣﴾ ﴾

And it is He Who created the night and the day and the sun and the moon. All (heavenly bodies) in an orbit are swimming.
(al-Anbiyā, Q21:33).

Regarding the nature of moon's light Allah says:

﴿ تَبَارَكَ ٱلَّذِى جَعَلَ فِى ٱلسَّمَآءِ بُرُوجًا وَجَعَلَ فِيهَا سِرَٰجًا وَقَمَرًا مُّنِيرًا ﴿٦١﴾ ﴾
Blessed is He who has placed in the sky great stars and placed therein a (burning) lamp and luminous moon.
(al-Furqan, Q25:61).

The Qur'an tells us that the light of the moon is reflected light according to the above verse. This corresponds to the explanation of astronomers in modern time, who asserts that the moon is an inert body that reflects the light of sun.

In another verse, Allah (S.W.T) mentions the importance of creating the sun and moon and nature of their light where He said:

﴿ هُوَ ٱلَّذِى جَعَلَ ٱلشَّمْسَ ضِيَآءً وَٱلْقَمَرَ نُورًا وَقَدَّرَهُۥ مَنَازِلَ
لِتَعْلَمُوا۟ عَدَدَ ٱلسِّنِينَ وَٱلْحِسَابَ ۚ مَا خَلَقَ ٱللَّهُ ذَٰلِكَ إِلَّا بِٱلْحَقِّ ۚ
يُفَصِّلُ ٱلْءَايَٰتِ لِقَوْمٍ يَعْلَمُونَ ﴿٥﴾ ﴾
It is He Who made the sun a shining light and the moon a derived light and determined for it phases that you may know the number of years and account (of time). Allah has not created this except in

truth. He delails signs for a people who know.

(Yunus, Q10:5).

Al-Mahalli *et al* (1431A.H:616) highlighted that in the above verse, Allah (SWT) Alone is the One who has made the rays that come forth from the bright sun as the source of light and heat. He provides the moon as a light by making the beams which are reflected from the surface of the moon. He also measured out its stages, as it is to the mansions to which the moon traverses in floating in its orbit around the earth. The stages ordained by Allah for the moon, is that it starts small (that the eyes can hardly see), then its light increases, until it gradually complete a full moon. Then it begins to decrease until it returns to its first phase at the end of the month. In other words, Allah has decreed twenty eight mansions for the moon in twenty eight days each lunar month and that it (the moon) is concealed for one night, if the month is twenty nine days and for two nights if the moon is thirty days.

The mansions which the moon traverse are very important to human beings, because they understand how to

count the number of years and they use it for reckoning. This therefore means that Allah created everything to serve one purpose or the other. He did not create His creatures for play and in vain.

The moon is very important to the Muslims in so many ways, such as the followings:

1. They use it to know when to observe the fasting of Ramadan, which comes in the 9th month of hijrah calendar. Observing fasting is one of the pillars of Islam.
2. The duties of hajj which start from the month of Shawwal (the 10th month of the Hijrah calendar) is also equally important as a fundamental pillar of Islam. This can only be possible by reckoning and counting.
3. Giving zakat which is also a pillar of Islam can only be possible by determining the period of time that one gets the nisab in his possession, before he gives out the required 2½% out of his total wealth.
4. The performance of Friday prayer which is an obligatory duty to the Muslims can only be possible by counting the days, to mention but few examples.

Furthermore, the differences between the moon and sun's light is shown in the following verse:

﴿ وَجَعَلَ ٱلْقَمَرَ فِيهِنَّ نُورًا وَجَعَلَ ٱلشَّمْسَ سِرَاجًا ﴿١٦﴾ ﴾

And made the moon therein a (refleted) light and made the sun a burning lamp?

(Nuh, Q71:16-17).

The nature of moon's light (Qamar) in Arabic is muneer (which refers to a body that gives light. As for the sun, otherwise called 'shams', which is the same as as-Siraj (meaning a torch), or diya (meaning a shinning glory) or wahaja (meaning a blazing lamp). These three words used in describing the nature of sun's light are very appropriate, because it generates intense heat and light by its internal combustion (Bucaille, 1986:161-162).

4.2.4 The Universe and its Expansion

The Almighty Allah regarding the nature of the universe says:

﴿ وَٱلسَّمَآءَ بَنَيْنَٰهَا بِأَيْىدٍ وَإِنَّا لَمُوسِعُونَ ﴿٤٧﴾ ﴾

And the heavens We constructed with strength, and indeed, We are (its) expander.

(adh-Dhāriyat, Q51:47)

Almighty Allah as pointed in the above verse was the One Who created the universe from the time which nobody can exactly mention. This universe continue expanding. The expansion of the universe was mentioned by an astronomer Stephen Hawking in (1971), who said that the stars, nebulae and heavenly bodies were moving at an unprecedented rate away from each other. This called for the need to invent stronger telescopes for astronomical observation. (Bucaille, 1986).

In 1925 however, an American astronomer, Edwin Hubble provided observational evidence that all the galaxies are moving close to or away gradually from one another. By implication, says Wadud (1971:1), it means that the universe is expanding. This is a scientific fact which Stephen Hawking (1971) said in his book *A Brief History of Time* that the discovery of the expansion of the universe was regarded as one of the great intellectual revolution of the 20th century.

4.2.5 The Mineral Iron

Iron is very important to the life of almost every human being living in our planet earth, because one hardly misses a

day without using it either directly or indirectly. People first used iron tools in the past 3000 years that is why it was called iron age according to Hornby (2000:634). In modern time, we use iron to make weapons of war and other tools we work with them in our homes, offices, and other places. The Glorious Qur'an revealed in the 7th century says the following with regard to iron:

﴿لَقَدْ أَرْسَلْنَا رُسُلَنَا بِالْبَيِّنَاتِ وَأَنزَلْنَا مَعَهُمُ الْكِتَابَ
وَالْمِيزَانَ لِيَقُومَ النَّاسُ بِالْقِسْطِ ۖ وَأَنزَلْنَا الْحَدِيدَ فِيهِ بَأْسٌ
شَدِيدٌ وَمَنَافِعُ لِلنَّاسِ وَلِيَعْلَمَ اللَّهُ مَن يَنصُرُهُ وَرُسُلَهُ بِالْغَيْبِ ۚ إِنَّ اللَّهَ
قَوِيٌّ عَزِيزٌ ﴿٢٥﴾﴾

We have already sent our Messengers with clear evidences and sent down with them the scripture and the balance that the people may maintain (their affairs) in justice. And We sent down iron, wherein is great military might and benefit for people and so that Allah may make evident those who support Him and His Messengers unseen. Indeed, Allah is powerful and Exalted in might.

(al-Hadid, Q57:25).

Ibn Kathir (2003:499-500) states the benefits of iron mentioned in Q57:25 above. According to him, it is used in

reference to weapons such as arrows, daggers, shields, spears, swords and so forth. These are used mostly during the wars in the olden days. Other benefits of iron he mentioned are that mankind use it to make coins, hammers, axes, chisels, shovels, and various tools that people use for tilling the land, sowing, cooking, making dough and manufacturing other objects necessary for their livelihood.

In modern time, iron is used to make instruments during peace time such as architectural and engineering instruments. Bricklayers, trowels, ploughshares, motor cars, motorcycles, bicycles, earoplanes, ships, and the like are also products from iron. In our homes, we use knives, chairs, doors, ceiling fans, windows, among other things derived from iron.

It was recently according to Ibrahim (1997), that scientists discovered the relevant fact about the formation process of iron on earth. They explained that elemental iron was not produced before, due to the reason that the energy of the early solar system was not sufficient. Bucaille (1986:50) maintains that information from the Qur'an and Science indicate that iron is an extra-terrestrial that was sent to earth

from outer space and not formed therein. This clearly confirms the saying of Allah in the above verse which states that *We send down iron* - - - (Q57:25).

4.2.6 The Conquest of Space

The Glorious Qur'an sometimes mentioned issues that were not fully comprehended by Muslims in the 7th century during the time of its revelation. It also makes predictions that come to be a reality. One of such issues is related to the conquest of space; being one of the achievement of modern science. Due to the advancement in technology, man was able to travel to as far as the moon. It was in 1969 that American astronauts made their first landing on the moon. Regarding this, Almighty Allah states:

﴿ يَٰمَعۡشَرَ ٱلۡجِنِّ وَٱلۡإِنسِ إِنِ ٱسۡتَطَعۡتُمۡ أَن تَنفُذُواْ مِنۡ أَقۡطَارِ ٱلسَّمَٰوَٰتِ وَٱلۡأَرۡضِ فَٱنفُذُواْۚ لَا تَنفُذُونَ إِلَّا بِسُلۡطَٰنٖ ٣٣ ﴾

O company of Jinn and mankind, if ou are able to pass beyond the regions of the heavens and the earth, then pass. You will not pass except by authority (from Allah).
(ar-Rahman, Q55:33).

The Almighty Allah addresses jinns and men out of His benovelance that if they want to travel beyond the zones of the

heavens, they can do so. But they were reminded that they will not be able to do so except with the permission or authority of the Creator.

The above issues really reveal that there is strong relationship between Qur'an and some scientific ideas. The Glorious Qur'an revealed in the 7th century to an unlettered Prophet (S.A.W) is therefore an authentic wordings of Almighty Allah. The obvious fact on its authenticity is that Muhammad (S.A.W) had no teacher as he lived in the desert. The proper meanings of some of the verses quoted above are better understood in our present time of the development of science and technology.

4.2.7 The Vegetable Kingdom

It has been explained previously that the life of all living organisms depends largely on green plants (such as grasses, trees and algae). Plants use light energy to carry out photosynthesis. The growth of plants also is dependent on the nature of water they absorb through rainfall and irrigation. Without water, life is not possible. The Almighty Allah in

whose parts are called (stamen and pistil). This means that Allah created everything in pairs, in line with what He said:

﴿ سُبْحَانَ ٱلَّذِى خَلَقَ ٱلْأَزْوَٰجَ كُلَّهَا مِمَّا تُنۢبِتُ ٱلْأَرْضُ وَمِنْ أَنفُسِهِمْ وَمِمَّا لَا يَعْلَمُونَ ﴿٣٦﴾ ﴾

Exalted is He Who created all pairs from what the earth grows and from themselves and from that which they do not know.
(Yasin, Q36:36)

Creating things in pairs–human beings, animals, and plants clearly demonstrates the powerful nature of Allah. He also creates other things that we do not know in pairs, but Angels are not included here, because they are neither males nor females, and they do not procreate.

It has been mentioned that plants are either males or females. One important question to ask in this regard is that, how do plants reproduce? The idea of reproduction in plants takes place in two forms. Bucaille (1986:201) expresses that, the first type of reproduction is called sexual, which refers to a biological process whose purpose is the appearance of a new individual identical to the one that gave it birth. In plant kingdom, reproduction takes place through the process of

pollination, in which pollen grain is carried from male organ (stamen) to female organ (pistil) by either one of the pollinating agents: winds, water, and insects. The second method of reproduction in plant is called asexual, which has to do with multiplication or special case of growth. It is the result of fragmentation of an organism which separated from the main plant and developed in such a way as it resembles the plant from which it came. Cutting, when taken from a plant and is placed in suitably watered soil and regenerated by the growth of new roots, can be regarded as an example of asexual reproduction. Some plants have organs specially designed for this, but others give off spores that behave like seeds (Bucaille, 1986:201).

The science of botany is compatible with the Glorious Qur'an. The latter states that only men of understanding reflect on the creations made by Almighty Allah as indicated in Q3:190-191. Almighty Allah also mentions about sending down rain and water as a blessing to us in various chapters like in Surah-al-An'am (The Cattle), Q6:99, surah al-Hijr (The Rocky Tract), Q15:22, surah al-Muminun (The Believers), Q23:18,

Surah-al-Shūra (Consultation), Q42:28, Surah al-wāqi'ah (The Inevitable Event), Q56:68-70. Scientists and even a layman know that life as a whole can only be possible when there is water, which causes the growth of plants and is used for many purposes.

With regard to plants, the Creator (Almighty Allah) has indicated in surah an-Nahl (The Bees), Q16:10 that our vegetation grows as a result of sending down rain. This clearly indicates the importance of rain water and the growth of our plants that we use to feed our cattle. Scientists in the field of Botany have indicated that the producers (plants) are very much important to the consumers (animals). Without the plants, animals' life cannot be possible.

The Almighty Allah indicates His ability of creating plants and fruits in pairs. This is shown in Surah Ta Ha (Q20:53), Surah ar Ra'ad (The thunder), Q13:3, Surah adh Dhāriyat (The wind that scatter) Q51:49 and other chapters of the Glorious Qur'an. Modern Scientists (botanists) asserted also that plants are created in pairs and that fruits are either males or females.

This shows that Botany and the Glorious Qur'an are compatible to each other.

The Qur'an further states in chapter 15:22 al-Hijr (the Rocky tract) that Almighty Allah sends fecundating winds that facilitate the process of pollination in plants. Botanical Scientists also maintained that the wind is an important agent of pollination, other than insects and water. The Prophet (S.A.W) in Sahih Muslim (Volume VII, Hadith 5830), approved the practice of pollination to his Companions as quoted a Hadith to that effect in chapter two.

As regard to the importance of chlorophyll in plants which has to do with the nature of their colour, which assist in the production of different kinds of grains, fruits and vegetation, Almighty Allah has mentioned a related issue regarding it in Surah al-An'am (The Cattle), Q6:99. Scientists such as De Saussure (1804), Meyer (1942) and Glass (1961) and others came to understand about chlorophyll after lengthy time they have taken in conducting researches.

Modern botanists as explained in chapter two have classified plants into three: Annuals, Biennials and Perennials.

Many important agricultural plants according to Ramalingan (1993:62-63) are annuals; among which include maize, rice, beans, flax, jute, sun flower and wheat. Examples of biennials include carbage, radish and turnip which are harvested for food immediately after the first growing season. The perennials include herbs, shrubs and trees, which continue to grow from year to year, producing flowers, fruits and seeds for many years. Agricultural scientists have classified the cultivated plants or crops into groups according to the products for which they are grown. These groups include beverages and drugs, cereals, fibres, forage crops, fruits, latex, legumes, oils, root crops, spices, and vegetables.

It is interesting to note that, whatever may be the classification of plants and explanation on their nature and importance, Almighty Allah is the Only One Who created them. He created them for our benefits, one of which is to help us to reflect deeply on His power regarding their creation. This is the reason why He asked us an important question in the Qur'an, where He says:

﴿ أَفَرَءَيْتُم مَّا تَحْرُثُونَ ﴿٦٣﴾ ءَأَنتُمْ تَزْرَعُونَهُۥٓ أَمْ نَحْنُ ٱلزَّٰرِعُونَ ﴿٦٤﴾ ﴾

And have you not seen that (seed) which you sow? Is it you who makes it grow, or are We the grower? If We willed, We could make it (dry) debris, and you would remain wonder.

(al-Waqi'ah, Q56:63-65).

Whatever is sown only germinates when Allah permits it to do so. Water, air, soil and other things have no power to cause the germination of seeds. They are only means (wasilah) which assist in the germination. In other words, Allah can create at anytime whatever He wishes without needing anything. There is harmony between Qur'an and science as regard to plants. Scientists can only explain what they have observed but cannot claim that plants created themselves or nature created them. If anybody claims that nature created something, then he can be asked, who created nature? No answer can be provided for this question by those who have such ideas.

4.3 What Influenced the Early Muslims to Study Science

In order to explain what influenced Muslims to study science and related disciplines, there is need to state that the

first Qur'anic verses revealed to the Prophet (S.A.W) started with:

﴿ ٱقۡرَأۡ بِٱسۡمِ رَبِّكَ ٱلَّذِي خَلَقَ ۝١ خَلَقَ ٱلۡإِنسَٰنَ مِنۡ عَلَقٍ ۝٢ ٱقۡرَأۡ وَرَبُّكَ ٱلۡأَكۡرَمُ ۝٣ ٱلَّذِي عَلَّمَ بِٱلۡقَلَمِ ۝٤ عَلَّمَ ٱلۡإِنسَٰنَ مَا لَمۡ يَعۡلَمۡ ۝٥ ﴾

Recite in the name of your Lord Who created, Created man from clinging subtance. Recite and your Lord is the most Generous. Who taught by the pen. Taught man that which he knew not.

(al-Alaq, Q96:1-5)

Almighty Allah started His revelation of Qur'anic verses by commanding the Prophet (S.A.W) to read. In the fourth verse above, He mentioned that He taught man by the pen. In other words, the first revelation started with two basic issues – the art of reading and writing. It means that Allah (SWT) encourages mankind to seek knowledge and ponder on what He creates so as to understand Him.

Islam from its very beginning accorded Muslims the spirit of enquiry and that was what actually motivated many scholars to study science side by side with Islamic Religious Studies. The Qur'an stimulated the early Muslims to try and find out things by themselves through conducting researches.

The spirit of enquiry and freedom of thought provided in Islam was not the same in the past civilizations such as Greeks. Wahiduddin (n.d:27) explained that during the period of stagnation (dark age) in the west, there was no cordial relationship between religion (Christianity) and science. Because of this, scientists such as Socrates (d. 399 B.C), Archimedes (d. 212 B.C) and others were forced to either commit suicide or were killed or forced to recant their views on scientific ideas and encouraging the spirit of enquiry.

In Hadith, being the second source of Islamic Law, the Prophet (S.A.W) encouraged the Muslims to seek knowledge, when he stated:

"اطلبوا العلم ولو بالصين"
Seek knowledge as far as to China.
(Mishkat, Vol. 1 Hadith 111w, P. 361)

In another Hadith he mentioned that:

"طلب العلم فريضة على كل مسلم ذكر أو أنثى"
Search for knowledge is compulsory upon every Muslim male and Muslim female.
(Mishkat al-Masabih, Vol. 1, Hadith 37, P. 351).

The above Ahādith and others emphasized that Muslims must seek knowledge even if they will travel for long distance

and that to seek knowledge is obligatory to all Muslims, irrespective of their sex. The Prophet (S.A.W) in another Hadith taught his Companions that seeking knowledge starts from the cradle to the grave; meaning that there is no time limit or age that will make a Muslim to stop seeking it.

The Prophet (S.A.W) apart from encouraging Muslims to seek knowledge, also provided scientific approach in the area of Medicine. To buttress this fact clearly, the Prophet (SAW) stated that:

"تداووا عباد الله، فإن الله عز وجل لم ينزل داء إلا أنزل معه شفاء إلا الموت والهرم" (رواه أحمد)

Seek medical treatment, for Allah has created no disease, except that he created its treatment, except death and old age.

(Musnad Ahmad, vol. 4, p. 278).

The above Hadith and others definitely influenced the early Muslims especially during the Umayyad and Abbasid period to study Medicine. Such study became inevitable because Allah (SWT) created man to serve Him. This can only be possible if man is in good health condition and strong. It was not by mere co-incidence therefore that the early Muslims developed the science of Medicine in its various aspects. The

prominent figures who contributed alot to the field of Medicine according to Gwandu (1994:3-5) included Abubakar Muhammad Bn Zakariya al-Razi (d.923C.E) and Hunayn bn Ishaq (d.873C.E) who immensely contributed in the field of general medicine, dentistry and ophthalmology.

Other contributors to medicine included Ali al-Husayn Ibn Abdullahi Ibn Sina (d. 1037C.E) popularly called Avicenna in the west. Lemu (1990:272) states that he wrote altogether between 200-300 works dealing with Physics, Chemistry, Medicine, Astronomy, etc. His most popular works are Qanun fi tibb (Canon of Medicine) and Kitab al-Shifah (Book of Healing). Abu al-Walid Muhammad Ibn Ahmad Ibn Rushd (d. 1198C.E) wrote some books like Kitab Kashf (Book of Realization) and Tahafut al-Tahafut (Inconsistency of the Philosophers). The writings of the aforementioned scholars and many others were translated into Latin.

The Glorious Qur'an greatly influenced Muslims to study science and in some cases it encourages mankind to deeply think on Allah's creation and why He created them. There are so many verses on this. The following are examples:

﴿ أَفَلَمْ يَنظُرُوٓاْ إِلَى ٱلسَّمَآءِ فَوْقَهُمْ كَيْفَ بَنَيْنَٰهَا وَزَيَّنَّٰهَا
وَمَا لَهَا مِن فُرُوجٍ ﴿٦﴾ وَٱلْأَرْضَ مَدَدْنَٰهَا وَأَلْقَيْنَا فِيهَا رَوَٰسِيَ
وَأَنۢبَتْنَا فِيهَا مِن كُلِّ زَوْجٍۭ بَهِيجٍ ﴿٧﴾ ﴾

Have they not looked at the heaven above them-how We structured it and (how) it has rifts? And the earth We spread it out and cast therein firmly set mountains and made grow therein (something) of every beautiful kind. (Qaf, Q50:6-7)

In another verse, He says:

﴿ ٱللَّهُ ٱلَّذِى سَخَّرَ لَكُمُ ٱلْبَحْرَ لِتَجْرِىَ ٱلْفُلْكُ فِيهِ بِأَمْرِهِۦ وَلِتَبْتَغُواْ مِن
فَضْلِهِۦ وَلَعَلَّكُمْ تَشْكُرُونَ ﴿١٢﴾ وَسَخَّرَ لَكُم مَّا فِى ٱلسَّمَٰوَٰتِ وَمَا فِى
ٱلْأَرْضِ جَمِيعًا مِّنْهُ ۚ إِنَّ فِى ذَٰلِكَ لَءَايَٰتٍ لِّقَوْمٍ يَتَفَكَّرُونَ ﴿١٣﴾ ﴾

It is Allah Who subjected to you the sea so that ships may sail upon it by His command and that you may seek of His bounty; and perhaps you will be grateful. And He has subjected to you whatever is on the heavens and whatever is on the earth-all from Him. Indeed, in that are signs for a people who give thought.
(al-Jāthiyah, Q45:12-13)

Allah (SWT) draws the attention of mankind in the above verses to ponder on His nature of creation of the heavens and earth, the mountains and plants' growth. He created other things such as the oceans for mankind to sail on ships and

derive so many benefits. He created the animals for the use of mankind. These verses and many more influenced some Muslims to study science in line with the call by Qur'anic verses to use their intellect to understand the purposes of creating the natural phenomena; with the aim of recognizing the greatness of Allah and then serve Him alone.

In line with the above explanation, within the reign of the Abbasid Caliphs that lasted for more than five hundred years (749-1258 C.E), the following Muslim scientists contributed marvelously to the development of one aspect of science or the other:

DATE	NAMES OF SCIENTISTS	AREAS OF INTEREST/CONTRIBUTIONS
721-815C.E	Jabir bn Hayyan (Geber)	Chemistry
728 -825C.E	Abu Ubaydah	Botany
740-828C.E	Abu Sa'id Abdulmalik Al-Asmā'i	Zoology, Botany and Animal Husbandry
781-869	Abu Uthman Amr al-Jāhizi	Zoology
802-861C.E	Al-Farghani Abu al-Abbas (Afragamus)	Astronomy
826-901C.E	Thabit bn Qurra	Mathematics
858-929C.E	Al-Baṭṭāni (Albateanius)	Astronomy and Mathematics

828-986C.E	Ahmad bn Abu Dawud al-Dinawari	Botany
940-998C.E	Abu al-Wafa Ahmad	Astronomy and Mathematics
936-1013C.E	Abu al-Qasim (Albucacis)	Physics
980-1037C.E	Abu Ali al-Husayn Ibn Sina (Avicenna)	Philosophy and Physics
d. 1099C.E	Abu Ubayd Allah Ibn Abdul Aziz al-Idrisi	Botany
1080-1169C.E	Abu Hamid Muhammad al-Māzini	Geography
1090-1162C.E	Ibn Zuhr, Abu Marwan Abdulmalik (Avenzoar)	Physics
1100-1185C.E	Ibn Tufayl	Philosophy and Physics
1135-1204C.E	Ibn Maimun (Maimonides)	Jewish Philosophy and Physics
1179-1229C.E	Yaqut Ibn Abdullah al-Hamawi	Geography
1201-1274C.E	Nasir al-Din al-Tŭsi	Astronomy, philosophy and mathematics

The Abbasid dynasty started in the year 132A.H/749 C.E and ended in the year 656 A.H/1258C.E, changing pattern every now and then in matters of politics and Islamic education. The role played by some Abbasid leaders such as

al-Mansur (d. 775 C.E) can not be over emphasized in the annal of intellectual development of the period, according to Fakhri (1970:15). Al-Mansur founded Baghdad in 762 C.E. One of the contributions he made was that he invited scholars and intellectuals from far and near to translate some books in various languages into Arabic. Hence, the major books of Galen (Circa 200CE) and Hippocrates (d. 436 B.C) and the great work of Ptolemy (90-168 B.C) in Astronomy were translated by Abu Yahya Ibn al-Batriq for Harun al-Rashid by Ibn Baktishu, the teacher of Hunayn Ibn Ishaq.

Hitti (1970:313) attested that Hunayn Ibn al-Ishaq (d.873C.E), the leader of translators received 500 dinar (nearly £250) every month, together with other translators. Al-Mamun paid Hunayn in gold the weight of the books he translated. Ibn Muqaffa, being one of the prominent translators contributed immensely in the creation of new Arabic prose style, conducive to the expression of scientific and philosophical thinking.

The second important figure who contributed to the intellectual development of the Abbasid dynasty, particularly in matters of education was al-Mamun (d. 833 C.E) who

established Bayt al-Hikmah (the house of wisdom) in Baghdad, in 830 C.E. This very house served as a translation bureau, an academy, and astronomical observatory. As noted by Wahiduddin (n.d:35), within eight years after the establishment of Baghdad, many Greek books were translated into Arabic, the scholarly language of the then time. Due to the fact that what the majority of the translators spoke were Aramaic language, many Greek works were first rendered into Aramaic (syriac)before they were finally translated into Arabic.

Fakhri (1970:16) expounds that al-Mamun sent emissaries to Byzantium to seek out and purchase for him books of ancient learning which were translated by a panel of scholars such as Yahi'a Ibn Masawaih and al-Hajjaj Ibn Mattar. This clearly shows that the early Muslims were greatly influenced by the translation of early Greek and other civilization's work, that stimulated them to develop interest in scientific studies.

The deep researches conducted by the Muslim scientists was as a result of the influence of the Qur'an and the study of some translated works of Greeks which made them to

contribute marvelously in the field of science and philosophy. Before the birth of modern science, the Muslims had their educational system, method of investigation and enquiry that were derived from the Glorious Qur'an. It was the Muslims through the process of translation that transmitted scientific ideas, philosophy and civilizations to the West. The following comment by Robert (1928:191) serves as an evidence on this assertion:

> The debt of our Science to that of the Arabs does not consist in startling discoveries or revolutionary theories, Science owes a great deal more to Arab culture, it owes its existence. The ancient world was as we saw pre-scientific. The Astronomy and Mathematics of the Greeks were a foreign interpretation, never thoroughly acclimatized in Greek cultures. The Greeks systematized, generalized and theorized, but the patient ways of investigation, the accumulation of positive knowledge, the minute method of science, detailed and prolonged observation, experimental enquiry, were altogether alien to the Greek temperament. What were call science, arose in Europe as a result of new spirit of enquiry, of new method of investigation, of the method of experiment, observation, measurement of the development of Mathematics in a form unknown to the Greeks. That spirit and those methods were introduced into the European world by the Arabs.

Abdulasam *et al* (1984:18) in Lai (1987) further acknowledged the following words of George Sarton which he stated thus:

> The main as well, as the least obvious achievement of the Middles Ages was the creation of experimental spirit; and this was primarily due to the Muslims, down to the 12th century.

Contrary to the comments of Robert (1928) and George Sarton on the achievement of Muslims and their introduction of new spirits and methods to the west, Baron Carra (1931) acknowledged the achievements of the Arab (Muslims) and at the same time relegated them to the status of pupils of the Greeks. This according to him means that whatever the Muslim scientists contributed was as a result of their study under the Greeks.

Wahiduddin (n.d:27) maintains that Russel (1946) also saw the Arabs as those who only transmitted Greek thought, that is to say they brought Greek knowledge to Europe through their translations.

With regard to the last two comments of Baron Carra and Russel, it is necessary to point out that the Arab (Muslims) did

not only transmit the Greek culture, but they had also contributed marvelously by introducing the new methods of inquiry in science and philosophy. What the Arabs had received from Greeks was not enough as pointed by Wahiduddin (n.d:66) to contribute and led the Western Europe to Renaissance. Because it did not form part of that thoughts of the Greeks. Had that been so, Europe thoughts would have been earlier transformed. The long time wasted in Europe (especially from the 6th – 10th centuries C.E) would not have been so, before it could have its renaissance.

4.4 The Relevance of Studying Life Science to the Muslims:

The Qur'an in some verses categorically states that this earth and all that is found in it are created by Almighty Allah for man's own good. Things of different nature were provided by Allah to enable man use and enjoy them so that he can serve the Creator. This is proved in the Glorious Qur'an where Allah states:

﴿ قُلْ مَنْ حَرَّمَ زِينَةَ ٱللَّهِ ٱلَّتِيٓ أَخْرَجَ لِعِبَادِهِۦ وَٱلطَّيِّبَٰتِ مِنَ ٱلرِّزْقِ ۚ قُلْ هِيَ لِلَّذِينَ ءَامَنُوا۟ فِى ٱلْحَيَوٰةِ ٱلدُّنْيَا خَالِصَةً يَوْمَ ٱلْقِيَٰمَةِ ۗ كَذَٰلِكَ نُفَصِّلُ ٱلْءَايَٰتِ لِقَوْمٍ يَعْلَمُونَ ﴿٣٢﴾ ﴾

Say, "who has forbidden the adornment of (i.e, from) Allah which He has produced for His servants and the good (lawful) things of provision?" Say, "They are for those who believe during worldly life (but) exclusively for them on the Day of Resurrection". This do We detail the verses for a people who know.

(al-A'raf, Q7:32).

The above verse clearly points out that all the physical and material things were created by Allah to enable man use them and serve Him. This further indicates that while Islam emphasizes on the life to come (hereafter), it at the same time recognizes the worldly needs of man.

All that were created by Almighty Allah are meant for some purposes. This is the reason why He says:

﴿ سَنُرِيهِمْ ءَايَٰتِنَا فِى ٱلْءَافَاقِ وَفِىٓ أَنفُسِهِمْ حَتَّىٰ يَتَبَيَّنَ لَهُمْ أَنَّهُ ٱلْحَقُّ ۗ أَوَلَمْ يَكْفِ بِرَبِّكَ أَنَّهُۥ عَلَىٰ كُلِّ شَىْءٍ شَهِيدٌ ﴿٥٣﴾ أَلَآ إِنَّهُمْ فِى مِرْيَةٍ مِّن لِّقَآءِ رَبِّهِمْ ۗ أَلَآ إِنَّهُۥ بِكُلِّ شَىْءٍ مُّحِيطٌۢ ﴿٥٤﴾ ﴾

We will show them our signs in the horizons and within themselves until it becomes clear to them that it is the truth. But is not sufficient concerning your Lord

that He is, over all things, a witness? Unquestionably, they are in doubt about the meeting with their Lord. Unquestionably He is, of all things encompassing.

(Fussilat, Q41: 53 -54).

In line with the above verses, Allah mentions that He has shown many signs in the things He created, including man's soul. The essence of it is to enable man understand the truth and believe in the existence of one true Creator.

The study of Life Science therefore becomes very relevant in line with what the above verses teach. This is because man believes in the existence of Allah by pondering on what the latter created. All that exist on earth such as the plants, animals, air, moon, sun, stars, life and death, the alternation of night and day, man's creation and his nature, among other things, draw man's attention to the very fact that those things must have been created by a Supernatural Being (Allah) not that they come into existence by naught. This is the reason why the Qur'an in so many places poses some philosophical questions such as don't you reflect? Don't you have fear of Allah? Don't you ponder? etc. Pondering on the creation of

Allah encourages the believers to have strong belief in their Creator.

Gwandu (1994:3) explains that, man is a vicegerent of Allah on earth. He is expected to live in this world a happy and useful life that befits his higher position. Man is required to serve Allah and to control the environment that he lives. He can not do these things without being in a healthy condition and with sufficient strength. In line with this, the study of Medicine is necessary. This was what encouraged renowned scholars such as Abu Bakr Muhammad bn Zakariya ar-Razi (865-923 C.E), Hunayn bn Ishaq (d. 873C.E), Abu Ali al-Husayn bn Abd Allah bn Sina (980-1037C.E), Abu al-Walid Muhammad bn Ahmad bn Rushd (1126 -1198 C.E), etc to study Medicine and contribute a lot in the field. The writings of these scholars and those not mentioned contributed to the development of medical science in Europe.

Man is encouraged to study life sciences according to Jumba (1994:1) to enable him explore nature for his benefit. In line with this, Wadud (1971:224-225) was of the opinion that those who study the natural phenomena by using their

sense organs and intellect and equally make use of the knowledge they have acquired for the benefit of humanity in accordance with the provision of the Shari'ah (Islamic Law), are counted as Muminun (believers) and Muttaqun (those who truly fear Allah). They will have a brighter life in this world and in the here after. This therefore tells us clearly that whatever service a person offers to humanity will be rewarded greatly by Almighty Allah (whether small or big) as can be seen in the following chapter of the Qur'an:

﴿ فَمَن يَعْمَلْ مِثْقَالَ ذَرَّةٍ خَيْرًا يَرَهُۥ ۝٧
وَمَن يَعْمَلْ مِثْقَالَ ذَرَّةٍ شَرًّا يَرَهُۥ ۝٨ ﴾

So whoever does an atom's weight of good will see it. And whoever does an atom's weight of evil will see it.
(al-Zilzilah, Q99:7-8)

The study of Biological science in the Qur'an, comprising of zoology and Botany would greatly help in breeding competent Muslim Zoologists and Botanists. Zoologists would be equipped on the nature of animals, their types and how best they can be utilized for man's consumption and domestic and other uses.

The study of embryology which is an aspect of medicine gives Muslims adequate knowledge on how man was created, the stages involved in his creation, such as the Nuṭfah (minute quantity of sperm stage), the 'Alaqah, (otherwise called the leech like stage), the Mudghah which is the same as (the chewed like substance) stage, the 'Izam or (Bony formation) stage, the Lahm or muscular flesh stage and the Nash'ah which is otherwise called (the foetal growth) stage. Embryological studies also educate a Muslim on the developmental stages of man from pre-natal to postnatal periods. In other words, the stages of man's infancy, childhood and adolescence would be understood through the study of embryology. Muslim scientists and physicists of today according to Zindani *et al* (2000:29) are perhaps more than ever in need of the wisdom and counsel of scholars and religious leaders, in order to understand the areas of similarities between Qur'an and some aspects of modern science such as embryology.

The study of Biology and Agricultural science in the words of Gwandu (1994:6), reveals the wonders of creation

and enables the believers to understand the processes of managing plants and animals for man's benefits on earth. The more man improves on the production of animals and plant resources, the better for human society, and the more the society is supplied with adequate food, clothes, and shelter, the better for it to concentrate fully on other matters including religious obligations, such as the observance of prayer at its stated times.

The study of Botany is equally important to the Muslims, in that it is an area in which plants are being studied. The value of plants is so great that man cannot escape from using them as sources of food, medication and for other domestic purposes. The importance of plants has been explained in chapter two and part of chapter four.

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CHAPTER FIVE
SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 SUMMARY

In the introductory chapter, the researcher stated in the background of the study that the revelation of the Qur'an began in a period when Arabs reached their peak in literary development, composing poems of varying lengths. When they were challenged by the Qur'an to produce the like of it, reduced to ten chapters and finally reduced to one, they could not do so, because it is inimitable. It was also pointed out that Muslims between the 8th and 12th centuries contributed marvelously to science due to the encouragement they got from the teaching of the Qur'an.

With regard to the statement of the problem, the researcher refuted the claims of those who upheld the view that the Qur'an was composed by Prophet Muhammad (S.A.W), with or without the support of others. This is a fallacy.

The significance of the study were pointed out in chapter one. Conducting a research on Modern Perspective of Life Science in the Glorious Qur'an: Synthesis and Analysis of

Muslim scholars views would be very significant to teachers and students in academic institutions as well as other Muslims who are opportuned to read this research. The study would help them to understand the extent to which the Glorious Qur'an relates to Life Science. In fact, the objectives of the study are mainly to educate the Muslims on the areas that Life science is compatible with the Glorious Qur'an.

In chapter two, the researcher reviewed the ideas of Muslim and non-Muslim writers related to the study under different sub-topics. The definition of Science was given, and this was followed by an explanation on the relationship between the Glorious Qur'an and Science. Facts and reasons were given in the chapter to show how the Glorious Qur'an explains many issues on Life Science.

Another important issue reviewed was the concept of evolution, where human and animal's evolutionary history and nature were highlighted. It was pointed out that, evolution is a process which has beginning and it continues according to the plan of Almighty Allah Who alone can create. The idea that man originated from ape or he came into existence by chance

or coincidence were refuted. Detailed explanation was also made on the biological aspects of human growth and development and the science of genetics in which it was pointed out how children inherited some characteristics from their parents.

The researcher also highlighted on some of the human sensory organs, endowed to him by Almighty Allah which are mentioned in the Glorious Qur'an. These include the senses of hearing, and sight, which were created for him, to enable him hear, see, and distinguish between the right and wrong and be comfortable in the perception of things. Related to man's sensory organs discussed in the chapter was the soul created also for man to judge and behave intelligently.

The science of embryology was elucidated in the Literature Review. Under this, the researcher reviewed how man was created and the stages that went with his creation. The six stages of human creation were explained by quoting from the Glorious Qur'an and Hadith as well as highlighting the views of classical commentators of the Qur'an and modern embryologists.

The origin and nature of animals were brought to light in the Literature Review. It was pin pointed that, animals originated from water and Almighty Allah provides all their nutritional needs according to their developmental stages. The researcher provided detailed explanation on some animals mentioned in the Qur'an such as Bees, Ants, Camels, Spiders and Birds with emphasis on their importance to man.

In-vitro fertilization and egg donation which are artificial method of reproduction that have become one of the contemporary topical issues were discussed. It was stated that Islam permits them subject to certain conditions, one of which is that, it must be limited to the married couple and should not involve third party.

In the second major aspect of chapter two, the researcher treated the teachings of the Prophet (S.A.W) to his Companions on some aspects of Life science, including plants and animals. The importance of plants, how they reproduce, chlorophyll in plants, uses of water, the nature of fruits, and their examples from Qur'an as well as their uses were

elaborated with appropriate quotations and views of commentators of the Qur'an.

The researcher explained in chapter three that, the research conducted is not experimental. Therefore, he obtained data from the primary and secondary sources to write the research reports. The primary sources of data mainly used were the Glorious Qur'an, Ahādith of the Prophet (S.A.W) and the classical Tafāsir books. The secondary sources of data consist of the books authored by Muslims and non-Muslim writers as well as the data obtained from internet, computer software, journals and seminar papers.

Research in Islamic Studies differs to certain extent with that of modern scientific research. In this regard, the researcher did not formulate hypothesis, instead, research questions were used which were answered in chapters two and four, by highlighting the views of classical Qur'anic commentators and other contemporary Muslims and non-Muslim writers on different topics and sub-topics. Statistical analysis, observation and experimentation were not used in this research due to the nature of the topic.

In chapter four, the researcher explained about ecosystem (which has to do with the nature of interaction between living things and the natural environment in which they live). The major components of ecosystem, consisting of the biotic and abiotic components were explained by quoting from the primary sources of Islam (Qur'an and Hadith). The biotic component mainly deals with the producers (plants and algae) and the consumers (animals) which consist of the herbivores, carnivores, and the omnivores that depend on plants to get their food. The abiotic component of the ecosystem which consists of the sunlight (energy), the hydrosphere (water), the atmosphere (air) and the lithosphere (soils, rocks and mountains) were highlighted by quoting chapters 2:164, 6:97, 28:71, 36:37-38 and 43:10 of the Glorious Qur'an in the explanation.

The relevance of studying Life Science by the Muslims was also highlighted. Some Qur'anic verses were quoted, in this regard, to point out that Islam encourages Muslims to study all aspects of knowledge, provided it does not clash with its teachings.

The researcher also analyzed some areas portraying the relationship between Qur'an and Science comprising of the origin of the universe, formation of cloud, the nature of moon and sun light, the mineral iron and its uses, the conquest of space and the vegetable kingdom. All these were explained by quoting verses from the Qur'an and pointing out how science is compatible with them.

5.2 Conclusion

The researcher would like to conclude by stating that the Glorious Qur'an is of Divine origin. It contains some scientific miracles that are compatible with some aspects of modern science. The following are some of the basic findings of the research:

(i) There is strong relationship between Qur'an and science, because the former encourages the study of the latter since the 7th century. In the three aspects of Life Science including Animal Science, Human embryology and botany as shown in chapters two and four, the facts explained are convincing enough to understand the relationship between Qur'an and Science.

(ii) There is compatibility between Science and Qur'an on Animals. In Surah an-Nur (the Light), Almighty Allah indicates that He creates every moving creature from water, and the scientists explained that all living organisms originated from water. The Qur'an in the same verse of surah an-Nur (Q24:45) classified animals into three based on the nature of their movement – by crawling, by walking with two legs and by moving with four legs. Scientists have classified animals into two groups of invertebrate and vertebrates, on the basis of their structural complexity and life history. The invertebrates and vertebrates animals either move by crawling, using two legs, four legs or more.

(iii) Science is compatible with Qur'an on plants in some respects. In Surah adh-Dhāriyat, (Q51:49), Allah indicates that, He creates everything in pairs (such as plants). Scientists also maintained that plants have male and female sexual organs called stamen and pistil. The Qur'an has also mentioned an idea related to the presence of chlorophyll in plants in Surah al-Mā'idah (Q6:99). This

chlorophyll is a chemical which makes them (plants) to be green. Scientists also explained this fact and emphasized that the chloroplasts which contain the pigment chlorophyll carry out photosynthesis which all life on earth depends on. Scientists (botanists) spent three hundered years on research before they realized the presence of chlorophyll in plants in 1600 C.E.

(iv) One of the scientific miracles of the Glorious Qur'an having to do with Life Science relates to Human embryology. The Qur'an in chapters 22:5, 23:12-14, 32:8, 49:13, 76:2, 80:18-19, 82:7, and 86:5-6 explained the distinct stages of human creation including the Nutfah (Minute Quantity of Sperm stage), the 'Alaqah (Leech like stage), the Mudghah (chewed like substance stage), the 'Izam (bony formation stage), the Lahm (muscular flesh stage) and the Nash'ah (fetal growth stage). All these stages and their periods seem to be related to the explanation of scientists in the field of medicine and Human embryology, as shown in the Literature review.

(v) The human sense organs are gifts from Almighty Allah to man for some purposes such as helping man to distinguish between the right and wrong things. The sense of hearing helps man to hear different sounds and recognize voices when talking. The sense of sight helps us to see things with our eyes.

(vi) Islam allows the practice of In-vitro fertilization only if it is carried out between married couples during their life time, if the implantation is in the wife and there is no involvement of the third party, otherwise it is not permissible. On the other hand, if the practice of egg donation involves a third party (surrogate mother) or that the egg of a woman is fertilized with the sperm of somebody besides her husband, this is totally prohibited. The reason for this prohibition is that the sperm may come from bank and the donor may not be known to the woman. Islam prohibits this so as to maintain proper family relationship. The children must know who their parents are, so as to bear their names and inherit them if they are dead. Any child born through the above methods

will not know his biological father. This creates a serious problem to the child.

(vii) Modern science and the Glorious Qur'an are compatible in some aspects in relation to ecosystem, because ecosystem has to do with how the producers (plants) and consumers (animals) relate to their physical environment. Both plants and animals and in fact all living organisms began from water (i.e their creation) and they cannot grow and survive without it. This is a fact that has been mentioned in the Qur'an and Biological scientists are of the same view. Modern science and Qur'an are also compatible with regard to the use of sunlight. The sun gives plants energy and this necessitates their growth. The significance of the sun is shown in Q78:13 and modern science also recognizes the value of sunlight which plants trap light energy (from it) and converts it to chemical energy. Another area of compatibility between science and Qur'an that relates to abiotic component of ecosystem has to do with the Lithosophere. The mountains which are part of the

Lithosophere are created by Almighty Allah so as to serve as stabilizers to the earth crust and hinder the shaking of the earth. The Qur'an in chapter 78:6-7 and Geologists have explained that these mountains have underlying roots embedded in the ground, among other areas as shown in chapter 2 and 4.

(viii) The relevance of studying Life Science by Muslims cannot be overemphasized. It helps to improve man's condition of life on earth, because Almighty Allah indicates in the Qur'an that all the beautiful things which He has produced for His servants is meant for their use. Man as a vicegerent of Allah on earth is expected to live a happy life and worship Allah which will benefit him in the life to come. He is required to worship his Creator and control the environment he lives in. This cannot be possible without being healthy. This is the reason why Medicine is studied in order to improve the living conditions of people. The study of Embryology as an aspect of life science gives Muslims adequate knowledge on how man was created. He is able to understand the distinct stages

he underwent before his creation. The study of Biology and Agricultural Science reveal the wonders of creation and enables the Muslims to understand how they can manage plants and animals for their benefits on earth. The study of Botany is important because we need plants as sources of food, medication, and other domestic purposes.

5.3 Recommendations

On the basis of the findings of this research as summarized above, the researcher hereby recommends the following:

1. Muslims must adhere to the teachings of the Glorious Qur'an and Hadith of the Prophet (S.A.W), because they are the most authentic source of guidance to Muslims in all ramifications of life.
2. The study of Science, and in fact, seeking knowledge should be encouraged by Muslim parents and teachers at all levels of our educational systems.
3. Wealthy Muslims and the governments at all levels should lay emphasis on giving scholarship to students and researchers in various fields of studies with

emphasis on Medicine, Pharmacy, Engineering, and the like.

4. Muslims' non-challant attitudes and their sleepy nature in matters of education should be changed, in order to ensure scientific progress in the Muslim world.
5. Further researches on other aspects of empirical science should be conducted by Post-graduate students and teachers, so as to understand more areas of compatibility between modern Science and Qur'an.
6. Muslims scholars should rewrite textbooks especially in biology, genetics and embryology for Muslims students.
7. There is a need for integration of Islamic and modern knowledge.
8. The course of Islamization of knowledge should be encouraged at different levels of education.

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