Part II
'Origin of life and man'

Introduction

Scientific understanding of the birth of life and man is very different from the traditional revealed model of Abrahimic religions that describes the creation of man. Modern Scientific consensus in this regard is that the births of life and man are connected and life arose on the planet only once and in the form of a single cell, popularly called LUCA or 'Last Universal Common Ancestor'. This LUCA evolved to produce three branches of life – Archaea, Bacteria and Eukaryota.

From the eukaryotes - fungi, plants and animals emerged. The plants then evolved further to diversify and support the life, while the animals ultimately produced the specie with the highest intelligence that can think, plan, investigate and utilize the resources of the planet according to his needs.

In this straightforward picture, complications exist from the very beginning. We do not know how the living matter emerged from the non-living. Highly complex 'modern-looking' fossilised life cells have been found in the oldest rocks of earth.[21] Given a living organism, it is possible to imagine ways in which it can multiply, but from where did the *first organism itself* – the LUCA come from, and what happened before the solidification of rocks? Did the cells originate on earth or in outer space? If life originated on earth then what was the mechanism involved. To explain the occurrence of this phenomenon through natural means, scientists have proposed various models such as Oparin's primordial soup[22], Dyson's metabolism first scenario[23], Arrhenius spores theory[24], Hoyle and Wickramasinghe's comet origin[25], Orgel's RNA world[26], Cairn-Smith's clay-templates and a host of others.

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21 Nature, vol. 409, p. 144, January 2001 – 'Latest estimates have put life at 3.85 Ga, earliest surviving continental crust at 4.0 Ga, and end of intense meteorite bombardment at 3.9 Ga'

22 Dreamer, D. W. and Fleischaker, Gail R., Origins of Life: The Central Concepts. Oparin, A. I. The origin of life on Earth. Macmillan (1938), Haldane, J.B.S. The origin of life. In: (eds.) On being the right size and other essays, Oxford University Press, Oxford, England (1985).

23 Dyson, Freeman J., Origins of Life

24 Wills, Christopher & Bada, Jeffrey, The Spark of Life – Darwin and the Primeval Soup

25 Hoyle, F. and Wickramasinghe, C. 'Lifecloud'

26 Orgel, L. E., 'The Origin of Life on the Earth' Scientific American 271 (1994): 77-83

These models not only differ in the extra-terrestrial and terrestrial origins they assign to life but also on the basic question as to what could have come first, the genes or the metabolic pathways. Every group believes in the efficacy of its own model with equal intensity, but the differences are many, and unanswered questions abound. The first cells have been found in the oldest rocks of the earth, therefore the events leading to the creation of these cells must have occurred *before* the formation of even these rocks or prior to the very ability of earth to form evidences.

Likewise, the birth of modern man is also a big mystery that intensely interests all of us. We do not know, when and where the first man appeared on the earth and what exactly was the mechanism involved. Did he evolve through accidental mutation and natural selection, or is there some other answer to this mystery? Has he evolved in different regions from different species of man-apes over time, or was there a single occurrence in Africa and then this man spread and replaced others? The scientific opinion favours a single origin in Africa, but several questions still remain unanswered. Why is there such a huge gap of 84,000 years between the beginning of Y chromosomal line of males representing the birth of first genetic father of Man and mitochondrial line of females, the birth of first woman – the so called genetic Eve of humanity? Why do archaeological records show a sudden change in the behaviour of human race at about 50,000 years ago? What had really happened at that time? Unfortunately, for the date of man's arrival on the scene, we depend only upon circumstantial evidence. The key to the mystery lies in our brains literally and figuratively. It is this *organ*, which makes us different from others, but brains do not fossilize. *Thus, the perfect evidence that could have solved the problem seems to lie just beyond our grasp.*

We can thus see that whether it is the emergence of life from non-life or the birth of first man, the events seem to lie on the periphery of scientific vision. *Many scientists say in jest that short of a knowledge revealed to us, none can answer such queries with certainty.*

To demonstrate that revealed knowledge *can* provide the answers *in reality*, pointers from Quran on the birth of life and man are presented. The objective of this attempt is to show a method of symbiosis, between 'revealed and the rational' knowledge, and how the combination of the two sources can benefit us.

Revelations from Quran on the origin of life and man

In the Quran, statements on different natural phenomena lie scattered all over the body of its text. To extract information about a topic, it is the usual practice of Muslim scholars to bring all verses on a particular subject

together and then study them as a whole.

By collecting all verses on the origin of life and man, we find that Quran rarely talks about the birth of life *directly*. Most of the verses detail the steps involved in the creation of man *in stages, beginning from the dust.*

Such information compels us to find answers for three main queries.

1. Does Quran faithfully repeat the Biblical view of the birth of first man from dust or the verses are hinting about a *different* process in this regard?
2. Is man's creation *unconnected* with all life on earth, or the creation of life from non-life (the dust) was the *first step* in the creation of man?
3. Do the words of Quran allow us to interpret the information outlining the *stages of man's creation* in any other way too?

The existance of patterns

A significant problem in this regard is the presence of 'patterns' in the nature that look *superficially similar* to each other at a basic level.

The development of a child within the womb and evolution of life on the earth are two such comparable patterns. A zygote in a uterus of the human female undergoes several stages of evolution, involving the formation of organic tissues, bones and different shapes in between, to become a human child. In the scientific view of the evolution of life also, a single cell is said to have evolved into a multi cellular organism like man, in various stages, involving the formation of organic tissues, bones and different species in between.

The resemblance between the two processes incidentally poses a difficulty in the understanding of information from Quran. In the absence of any alternative line of explanations, any similarity, even such a superficial one between the two processes, is likely to influence the commentators to interpret the information *with reference to the only pattern* available to them till recently – *the process of child birth.*

Usage of peculiar words and enigmatic compositions

Scientists have also realized that the universe is *not only comprehensible; it is also intelligible in parts and stages, with the increasing cognitive ability of the human mind.* This fact has been amply demonstrated in the continuous progress of science and in the gradual decoding of 'laws of nature' with ever increasing depth and sophistication.

The revelations, akin to the laws of nature, also have an inherent progressive complexity about them. This successive complexity is built into the content of Quran (the Source of revelations under discussion), through the usage of peculiar words and enigmatic compositions, in combination with repeated instructions to reflect on the verses. The subtlety of composition is such that *the information seemingly does not diverge much from the*

existing knowledge of the time, so as to remain acceptable generally. Yet, on closer examination of the words used, the verses seem to reveal a different depth of meanings against the background of fresh information. The beauty of the verses is that with the increase in knowledge, *the meanings seem to gravitate ever closer towards the original usage of the word*, preserved in the earliest sources.

The resemblance with the knowledge of the time, however, reinforces the child birth line of explanation by the commentators unfortunately.

The only solution thus for finding out exactly what the verses are saying about the creation of man, is, to probe deeply into the meanings of the specific terms used in all such verses. But, such an attempt creates more problems of its own.

Popularity of the derived meanings

Down the ages, scholars have always tried to interpret the enigmatic statements to the best of their ability and intentions. These interpreters of Quran often had to strike a compromise between knowledge of the time, and in the literal meaning of words, which the study of Arabic philology provides. Their efforts at compromise have often resulted in the derived meanings becoming more popular than their root meanings.

Foreign connotations

Another problem was of the introduction of 'foreign connotations' of Arabic words. After the advent of Quran, the Islamic realm had also expanded very fast. Within a short time of few decades, over half of the world had come under its sway. This sudden expansion had resulted in a tremendous amount of interaction with new people and situations. This situation in turn had resulted into emergence of several connotations of words that were not present in the original. Assimilating all these meanings into their collection, the lexicons of Arabic, Persian and Urdu later gave them a stamp of undue credibility, which they did not deserve. The literal meanings of the specific words used thus became obscure, affecting the potential for dynamic interpretation of statements through an increasing knowledge base.

The one thousand years of scientific inactivity of Islamic followers, and the strict bar on new researches on Quran, all factors seem to have contributed negatively and have resulted in the traditional Islamic view on our origins becoming gradually frozen in the Judeo Christian mould.

Quran's solution

To steer out of this maze, the Quran has itself guided the interpreters by pointing out the usage of chaste Arabic - *Aarabiyyun mubeen* [*An-Nahl* 16: 103] as its medium of communication. The text also refers to itself as straight in its meaning *Qaiyim*, and without any crookedness *iwaj* [Al-*Kahf* 18: 1, 2]. Significantly, such an emphasis on straight and clear meanings of

words goes against the possibility of *multiple connotations of a word from the beginning,* which is a popular belief among Arabic scholars. Multiple connotations introduce uncertainties in the choice of meanings and clearly go against the claims of Quran.

For a communication to reveal unambiguous message, the words are expected to have *a single definite connotation* implying a clear meaning. The research aims to show that such a meaning *exists* for many of the terms used; and can be *isolated and selected for understanding the message correctly* by investigating the usage of all words from the same root in Quran and then *correlating these terms with other words from the same family of Arabic roots.*

'Respect' for elders vs 'uncritical acceptance' of their ideas and beliefs

The biggest barrier expected in such an exercise, ironically, is the reverence which an average Muslim has for the works of past commentators, who had understood the text as per their own knowledge of the time.

The Quran, surprisingly, has not left this problem unresolved. It has noticeably warned about this tendency, and makes a clear distinction between 'respect' for elders and 'uncritical acceptance' of their ideas and beliefs. The former has been encouraged[27]; while the latter has been frowned upon in the strongest possible terms. In fact, Quran has described the '*uncritical* acceptance of elder's beliefs and ideas' as being the biggest stumbling block [28] that all Prophets of God had faced during their missions.

Fortunately, the original text lies unchanged in millions of homes, and early grammarians had preserved how the words were understood by natives of the time.[29] From such a study of the Arabic roots, several pointers emerge on the birth of life and man. These hints help us differentiate and understand, correctly the pronouncements of Quran on the child birth, on creation and evolution of life, and about its linkage with the modern man.

1. Man has a terrestrial origin

The first hint presented in this regard is from *Sura Nuh*, where the Quran unambiguously informs us that man has a *terrestrial* origin.

And Allah has produced you *from the earth*, growing (gradually) [71: 17]

This statement categorically rejects all extra-terrestrial models for the birth of life, such as Arrhenius spores theory or Hoyle and Wickramasinghe's comet origin hypothesis.

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27 [*Al-Isra* 17: 23, 24; *Luqman* 31: 14, 15]

28 [*Baqra* 2: 170; *Maeda* 5: 104; *Yunus* 10: 78; *Hud* 11: 109; *Ibrahim* 14: 10; *An-Nahl* 16: 35; *Ash-suara* 26: 74; *Luqman* 31: 21]

29 This subject has been dealt in detail, under the heading 'Suggestion of a mechanism for verification of the information in revelations'

The revelation directs us to limit our search for the origin of life *to terrestrial* explanations only. Moreover, three additional hints from the original Arabic words – *'Wallahu Ambatakum-minal arzi nabaataa'* – are also significant.

2. Link of plants with man's birth

The two words *'Anbata'* أَنْبتْ and *'nabaata'* نَبَاتًا in this verse belong to a common root *(nbt -* نْبتْ*)*, implying plant or vegetation. *'Anbata'* means to produce plants, bring forth vegetation, to germinate, cause to sprout; to make (something) grow; to grow, raise, plant, cultivate. The translation of *min-al arzi* is 'from the earth', and the word *'nabaata'* means plants, vegetables, vegetation *[Al-Mawrid]*.

The usage of both the words together thus shows a *definite link of plants with man's birth from earth.*

3. Branches of life

A third point to note here is that the statement *'Wallahu Ambatakum-minal arzi'* by itself, was sufficient to suggest that 'Allah has produced *you* like plants from the earth, but the verse contains an additional word *'nabaata'*. Commentators have interpreted the usage of this additional word, meaning 'plant or vegetation' as an emphasis for the gradual growth of man, but it is an interpretation, and not the exact translation.

Literally translated, the word becomes a baggage of the primary information. It seems to refer to the growth of *plants, a different branch of life along with man from the earth* – the 'man' addressed by 'you' in the verse, and *nabata* - the plants.

4. Creation was not an instantaneous act

Fourth point here is that the traditional scriptural view on man's creation is represented by the following words of *Genesis* [2: 7] 'the Lord God formed the man from the dust of the ground and breathed into his nostrils the breath of life, and the Man became a living being.' This statement primarily describes the actual creation process of man in Bible, apart from calling him as 'son of mud' at some other places. The point to note here is that associating a plant like growth with this process, and referring to another branch of life along side, the verse in Quran reveals information that does not tally with an instantaneous act of clay modeling and animation of this model into Adam, the First Man. The description seems *more apt for a slow and gradual process that resulted in life with branches.*

5. Man's creation was in stages or phases

The existence of a process involved in the creation of man is reinforced through an important hint about the involvement of stages or phases in a verse also from *Sura Nuh.*

[God] fashioned you in stages [or phases] [71: 14]

Here the words used are *khalaqa* خَلَقَ and *aTwar* أطْوَار. The word *khalaqa* involves the idea of creation with measuring, and fitting into a scheme of other things. Its root *khlq* also refers to creativity. The word *aTwar* (singular *Tawr* طَوْر) on the other hand, implies stages or phases *in man's creation*. The meaning of 'evolution' or 'evolving into something new' is inherent in the root (*Twr*). Most of the commentators have understood the usage of *aTwar*, as referring to the development in uterus, but *no reference to 'rahim' or 'batan' (uterus) exists anywhere in the entire chapter.* The context of the chapter on the other hand clubs *aTwar* or phases with man's plant-like growth from the earth, mentioned two verses later (71: 17 quoted above).

6. Creation first and shape afterwards

Sixth hint in this regard is that in the traditional Judeo-Christian and Islamic models, the common understanding is that the *clay was given the shape of human body first and then the man was created by giving life to this shape.*

The revelations, on the other hand, seem to state something different in *Sura Al-Araf-*

It is We Who *created you; then gave you shape; then* We bade the angels prostrate to Adam, so they prostrated; not so Iblis; He refused to be of those who prostrate. [*Al-Araf* 7: 11]

In the original وَلَقَدْ خَلَقْنَاكُمْ ثُمَّ صَوَّرْنَاكُمْ *Walaqad khalaqnakum thumma sawwarnakum,* the preposition *thumma* ثُمَّ meaning 'then or thereafter' has been used. This usage clarifies that *first*, the creation took place - *khalaqa* (خَلَق), and *then* the 'shape was given to you' - *sawwarnakum* (صَوَّرْنَاكُم), in contradiction with the popular belief of *shape first and creation of life later.* Second, by repeating the usage of *thumma* again prior to God's clear instruction to angels for prostrating before Adam, the Quran *further* clarifies that God is talking about the creation of *First* Man and not about the *'creation and shaping of all humans in the uterus'.*

Combining this sequence with the plant like growth from the earth [*Nuh* 71: 17] and the involvement of stages [*Nuh* 71: 14] in the growth of man, the inference becomes progressively clearer. The *creation is a process and continuity exists between origin of life and birth of man on earth. The end product of this process seems to be man who is the object of instruction to angels in the second component of this verse.*

7. Involvement of a long period in the creation of man

Another hint from *Sura Al-Insan* points towards the passage of a long period over or during the stages of man's creation.

Has there not been over man a long period of time, when he was nothing mentioned (describable)? *[Al-Insan 76*: 1]

The original words of this verse - *Hal ata AAala al-insani heenun mina alddahri lam yakun shay-an mathkooran* reveal three curious pieces of

information.

a. The Arabic expression for 'a long period of time' - *heiinun-minad-dahri* - contains two words *hiin* حِينٌ and *Dahr* دَّهْر apart from the preposition *min* مِنَ which means 'of or from'. The word *hiin* means 'an unspecified particular period', while *Dahr* is 'passage of time, age or epoch, who's beginning and end are unknown'. The word *Dahara* means to defeat, overwhelm, subdue, and *Dahr* with meaning "time, age, or epoch" is so called because the ancient Arabs perceived *Dahr* as a factor or agent that wears away and annihilates everything on its path. Its similarity with the concept of increasing entropy is interesting.

In the 7th century, no one had any idea, when time had begun or would ultimately end. The modern physicists too, do not know *when the time would end*, but they believe that they can offer a reasonable estimate of the *beginning* of time at least. The *Dahr* for us seemingly had begun more than thirteen billion years ago. The association of *hein* with *Dahr* thus implies a significantly large period from this vast (thirteen billion years) expanse of time[30].

b. This large time has been stated to have passed 'over man' (ala'al insaani - عَلَى الإنْسَان), implying it a period during the formative stage of man.

8. A thing without description

During this period, man has been described in this verse, through the words شَيْئًا مَذْكُورًا - *Shii mazkura.* The word *Shii* means a 'thing', and *mazkura* is the usage of negative *'ma'* with *zikr* - meaning description. *Shii mazkura* thus mean a thing, which does not have a description or is 'not worth describing'.

Commentators have interpreted the above verse with reference to man's time in uterus, but this period is neither so long so as to be associated with *Dahr* nor can a stage of developing foetus be described as 'not worth describing'.

On the other hand, if a continuity exists in the birth of life and man, then the reference in this verse may be assumed to describe a particularly 'long period' during the gradual growth and creation phases of (life and) man on earth, mentioned in *Sura Nuh* [71: 14,17]. However, this fact alone cannot explain why the term *Shii mazkura* - 'a thing not worth the description' has been used to describe an early stage in the life's progress during this long period.

Surprisingly, all researches for tracing the common ancestor genes of different families of proteins from a wide variety of animals, plants, bacteria

30 Maudoodi, Abul Ala– Tafheemul Quran, p 185.

and Achaea, have found that the molecular trail for each family *ends abruptly at 2-2.5 billion years ago*. This finding has surprised every one, as life cell has been discovered in the rocks about 3.9 billion year old. The combination of two findings suggests that for more than 1.5 billion years, the life *did not progress at all*. It remained in the unicellular state, almost as the verse says 'not worth the description'.

To explain these anomalous findings, Dr. Russell Doolittle[31] who had published the original research in 1996, had suggested that about 2-2.5 billion years ago a massive catastrophe, a 'Doolittle Event' had occurred that had destroyed almost all the life from the earth. The only survivors were few bacteria, which started the life afresh. This explanation seemed plausible, but fossil records and geological studies do not corroborate such a massive event at this time. It is for this reason that Dr Doolittle's molecular findings have been accepted, but not his explanation.

The verse in the Quran seems to corroborate that life during a large period seems to have remained in an insignificant state (unicellular stage). It thus rejects Dr Doolittle's catastrophic event scenario, representing regeneration of life's progress afresh.

What really happened during this long period still remains a mystery for scientists; however, the revelations give us a hint discussed ahead[32] that has the potential to explain the mysterious inactivity.

9. Man's creation is different from the image of God

Ninth point is that the Quran clearly differs from a popular Biblical concept in this regard. It does not corroborate the Judeo Christian belief that man has been created *in the image of God*. These words have *not* been mentioned anywhere.

The Quran says clearly about God that 'there is nothing like unto Him' [*Sura Ash-Shura* 42: 11] *laysa kamithlihi shay* and there is also 'nothing that could he compared with Him' *Walam yakun lahu kufuwan ahadun* [*Sura Al-Ikhlas* 112: 4].

A strange verse from *Sura An-Noor* [24: 35] has been discussed ahead. It explains the Creator concept through a complex allegory. This verse popularly known as 'light verse' seems to reveal the image of God that encompasses universe after universe, and layers over layers of complexity. There are almost no points of similarity with the shape of a man.

10. Man was created in the best possible way

Tenth point is that the Quran states clearly in *Sura At-Tin* that man's creation was part of a process that was predetermined in the best way.

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31 Christopher Wills & Jaffrey Bada, 'The Spark of Life', Page 190-208,

32 Please see the discussion ahead under title - 'A curious coincidence' - Pg 121.

We fashioned man according to the best way. [*At-Tin* 95: 4]

Original words of the verse *Laqad khalaqna al-insana fee ahsani taqweem* use the word *Khalaqa* (explained earlier) with two others *ahsani taqwiym* تَقْوِيمِ أَحْسَنَ. The word *ahsan* means the 'best' and root of *taqwiym* is قوم *qwm*. It has two meanings: qawm – a group of people; and qawama – to stand up. *Taqwiim* is a deverbal noun from the verb *qawwama* – which means to erect, to rouse. (*Maurid*)

Combination of the two words suggests a meaning 'to erect or rouse something in the best way'. Since *khalaqa* means 'creation with measuring and fitting into a scheme of other things', the full statement thus implies that man's creation was part of a process which was predetermined in the best way and fitted into schemes of other things.

What would such a statement imply regarding man's creation? Does it corroborate or contradict the scientific point of view? And most important of all, what exactly is scientific view?

The Scientific view

For the growth and divergence of life, scientists have identified *four patterns* in the nature; and have suggested some processes to explain these patterns.

First pattern is the presence of *tremendous genetic diversity* within almost all living species including humans. No two individuals seem to have the same DNA sequence (barring identical twins or clones).

Second, the living organisms have morphological, biochemical and behavioral features that seem to make them *well adapted for life* in the environments in which they are usually found.

Third, all living species share the same basic mechanism of heredity using DNA (or RNA in some viruses) to encode genes that are passed from parent to offspring. With the help of these DNA sequences, biologists have quantified the genetic similarities and differences among species, in order to determine which species are more closely related to one another and which are more distantly related. The pattern of genetic relatedness between all species indicates a branching tree that implies *divergence from a common ancestor.*

Fourth, the presence of *mineralized remnants or impressions of once living organisms* (fossils) in different strata of earth, shows a definite but *patchy* pattern, which in conjunction with genetic information, helps to correlate the time and other factors in the growth and divergence of life on this planet.

From the study of these evidences, scientists have surmised that life has 'evolved' over time from a universal common ancestor. They define the term 'evolution' as 'descent with modification'. To explain, how this *modification* takes place, they suggest two processes – mutation and

recombination of genes. Mutation occurs when DNA is imperfectly copied during replication, leading to a difference between a parent's gene and that of its offspring. Recombination occurs when genes from two parents are shuffled to produce an offspring, as happens routinely in sexual reproduction.

Scientists *believe* that in both cases, the fate of genetic variant depends upon 'drift' and 'selection'. Drift refers to random fluctuations in gene frequency, applied to the transmission of genetic variants over several generations. Selection on the other hand is a process by which organisms become gradually adapted to their environment. Selection occurs when some individual organisms have genes that encode physical or behavioral features that allow them to better harvest the resources, or avoid predators etc, relative to other individuals, who do not carry the same genes. The evolutionary biologists claim that individuals who have these useful features will tend to leave more offspring than other individuals, so the responsible genes will become more common over time, leading the population as a whole to become better adapted. Thus, scientists say that the occurrence of mutations may be random in the progress of life, but the result of selection process itself is not random.

However there are gaps and problems in the availability of evidences, their interpretations and correlation with the processes outlined.

Problems in the scientific view

First kind of problems is pointed out by those biologists[33] who argue that the concept of a tree of life is outdated and needs to be discarded. Central to the Darwin's concept is the 'vertical' descent of life, with organisms passing traits down to their offspring, forming branches. However, genetic relatedness in bacteria, archaea and unicellular eukaryotes, seem to suggest that genetic material have been swapped with other species routinely - often across huge taxonomic distances - in a process called horizontal gene transfer (HGT) . This process is well established and presents the picture of a *web of life,* a thicket, instead of the *neat picture of a tree.* Moreover, another process called endosymbiosis, alongwith (HGT), has further blurred the branching tree concept. Early on in their evolution, eukaryotes are thought to have engulfed two free-living prokaryotes. One of these gave rise to the cellular power generators called mitochondria while the other was the precursor of the chloroplasts, in which photosynthesis takes place.

This web like genetic relatedness in organisms that constitute at least 90 per cent of all

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33 'Why Darwin was wrong about the tree of life' by Graham Lawton, Issue - 2692 of New Scientist magazine, page 34-39, dated 21 January 2009.

known species, and who have been on earth for most of the time, demonstrate that the classic picture of evolution – 'descent with modification through selection' does not tell the true and whole story of life. Some other factors, not yet visible to the scientists, need to be considered in this picture.

Second kind of problems is identified by those, whose beliefs in their own scriptures, comes in conflict with the theory of evolution by natural selection. The problems cited by this group are enormous complexity of the birth of first living cell; the short time involved in it; problems with random mutation; lack of intermediate forms in the fossil record; sudden emergence of species; and organs of irreducible complexity etc. Citing these problems, the group simply reject the 'evolution' as a viable process[34] and claim that *different species did not evolve but were created complete, in particular periods by the Creato*r. How was this creation done is not explained. The logic used in these arguments is based on disjunctive inference. If a problem has only two solutions (species either evolved by themselves or were created by a Creator), all one has to do is to prove one of the solution as wrong.

Sura At-Tin's statement [95: 4]

Quranic statement that 'man's creation was part of a process which was predetermined in the best way and fitted into schemes of other things' neither corroborates nor rejects the theories outlined above. The definite statement it makes is that the man's creation was neither absolutely random nor unsupervised but was part of a predetermined best process that fitted into schemes of other things. It is flexible enough to include 'HGT' alongwith 'selection' as a pre-designed process, with 'random mutation' as a dynamic component of design; or it may encompass other factors and processes in the creation of life, which either have been only partially understood by scientists or have not yet come under the purview of scientific investigation.

11. Process of creation started from clay

The Quran confirms that the basic components used in the creation process of man are تُرَاب *turab* and مَاء *maa. Turab* means dust, which is basically Silica; and *maa* means water.

The expression – 'We fashioned you from dust' - has been repeated in Quran at *five* places. [35]

The Quran however, reveals unambiguously that the actual creation *began from clay*. Out of seven references, where man's creation from clay (*tiyn* طِين), a combination of soil and water, is mentioned[36], this assertion is contained in *Sura As-Sajida.*

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34 The topic has been discussed ahead under the title 'Creation – a different perspective', and 'arguments against the theory of evolution'.

35 [*Al- Hajj* 22: 5; *Al-Kahf* 18: 37; *Ar-Room* 30: 20; *Fatir* 35: 11; *Al-Ghafir* 40: 67]

36 [*Al-Anaam* 6: 2; *Al-Araf* 7: 12; *Al-Isra* 17: 61; *Al-Mumenoon* 23: 12; *As-Sajda* 32: 7; *Sad* 38: 71, 76]

And He began the creation of man from clay [32: 7]

The original words are '*Wa bada'a khalqal-insani min-tiyn'*, where *wa* means 'and', *badaa* ´ بَدَأَ - to begin, to originate, *khalqa* – creation, *insaan* – man, *min* – from, and *tiyn* - clay.

The 'beginning' naturally implies a process with other stages to follow.

How did this beginning occur from clay?

If we accept that man is a product of a process that began with the creation of first living organism on earth, then Cairn-Smith's clay template scenario is the only one which suggests an explanation for life's origin from clay, out of all 'origin of life' models. A brief outline of this theory is presented here.

Brief outline of Cairn-Smith's clay crystal theory

A. G. Cairn-Smith has suggested[37] that naturally occurring microscopic mineral crystals in clays might have served as the basis for replication until the time when nucleic acids evolved and took over the function of replication. Clay micro crystals consist of flat plates of silicate lattices with regular arrays of ionic sites occupied by various metals. When such a crystal is contained in a droplet of water, the metal ions form irregular patterns of electrostatic potential that can attract particular molecules to the surfaces of the lattice, and catalyze chemical reactions. Which reactions are catalyzed depends upon the precise arrangement of the metal ions. Molecules synthesized in this manner could be released back to the water. Because a crystal grows by incorporating silicate and metal ions from the surrounding water, the new materials are similar in composition to the original parts of the crystal that generated them. Thus, crystals could, in principle, both replicate information and also transfer it to other molecules.

According to this theory, the clay lattice first directed the synthesis of primitive enzymes. For a long time, the clay crystals functioned as primitive genetic material, but at some point, by mechanisms unspecified as yet, RNA evolved and took over the role of replicating and transferring information. Once RNA appeared, it was so much better as a genetic material that clay-based life was quickly out-competed by RNA-based life, and driven to extinction.

Although scientists believe that such a scenario is plausible, critical experiments to test some of its key assumptions have not yet been performed. Some scientists object to this theory on the ground that lower complexity of clay and its simpler chemistry may prove to be

37 A. G. Cairns-Smith first proposed the idea that crystals were the first living organisms in a paper in 1966. The idea was later expounded further through other books and papers on it listed in the bibliography.