

Quranic Cosmogony: Impact of Contemporary Cosmology on the Interpretation of Quranic Passages Relating to the Origin of the Universe

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Abstract

Cosmogony refers to the origination of the physical universe and its evolution. With the modern cosmological theory of the ‘Big Bang’ referring to the starting point of the known Universe, cosmogony has now become a subject for discussion among the scientific community. This paper discusses how modern scientific findings have influenced the interpretation of cosmogonical passages in the Quran specifically 21:30 (on the common origin of earth and sky), 25:59 (on the six days of creation) and 51:47 (on the expansion of the sky). In this study we will cover only the physical aspects of Quranic cosmogony focusing on modern scientific discoveries and Tafsirs, and comparing recent cosmological theories and Quranic scientific interpretations (*tafsir al-ilmi*) available in modern Tafsirs, books, and Internet sources with those in the classical works of Islam (*turath al-Islami*). Our study shows that modern scientific findings do indeed influence modern Muslims’ understanding of the Quran’s cosmogonical terms, concepts and narratives by modifying the older Tafsir sources, even deviating from them altogether and offering fresh ideas. We end this paper by discussing the modern cosmological interpretation approaches of *tafsir al-ilmi*, its challenges and hopes.

Keywords: Al-Quran Science, Tafsir Origin, Cosmogony, Cosmology

1. Introduction

Cosmogony comes from a Greek term referring to the origin of the cosmos or any particular system in the universe including its early development. Until the early 20th century, scientists thought that the cosmos was eternal or static. This is known as the Steady State Theory — a theory that can be traced back to Aristotle (d. 322 BC) who proposed that it is only this sublunary (Earthly) region which is subjected to ‘generation and corruption’ [Potter 2010; Fakhry 2004].

Based on Einstein’s General Relativity Theory, in 1927 George Lemaitre (1894–1966) proposed that the universe is expanding, and further suggested that it must at an earlier time have begun from something much smaller and enormously compressed which was later named as the ‘Big Bang’. However, it was only at the end of the 1960s, after the discovery

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of the cosmic microwave background (CMB) that the scientific community accepted the Big Bang cosmological model. Since then the subject of cosmic origin has entered the discussion of modern science [Hawking 1988]. Only as recently as 2003, the age of our universe has been proclaimed as 13.7 billion years [Potter 2010].

These new discoveries and theories also attracted the religious community. The fact that the universe has its starting point is considered by many to indicate that it was created. This is the familiar argument of *Kalam* [Wolfson 1976; Altaei 2008], also mentioned in the philosophical-interpretive approach (such as Razi's *Tafsir*) and the subject of discussion in Tabari's *Tarikh* before the process of the creation itself. One area where new scientific discoveries have made an impact is the Quranic exegesis. By 1976, this interpretation or *tafsir* approach — popularly known as *tafsir al-ilmi* or scientific exegesis — had become so popular that al-Dhahabi included it among the types of Quranic exegesis. Baljon [1968] thinks that the first application of scientific exegesis can be traced back to the work of *Tafsir Manar* by Muhammad Abduh (1849–1905). For a non-*tafsir* work, a certain Muhammad Ibn Ahmad al-Iskandarani in his book entitled *Kashf al-Asrar al-Nuraniyyah al-Quraniyyah* published in 1880 seems to be the first [Jansen 1980].

One of the earliest discussions in Quranic commentary regarding the origin of the world applying modern scientific methodology can be found in *the tafsir work* of Syeikh Tantawi Jauhari (1870–1940) published in 1930. The subject of origin then appears in both modern *tafsir* literature and general genre usually asserting claims that scientific information in Quran, are not only a proof of the existence of God (as our pre-modern authors asserted), but also of Quranic miracles. Cedar notes that the scientific reading of sacred works has become popular, not just among Muslims, but also among followers of other religions.

Do new scientific theories and discoveries alter the process and solution of the old *tafsir* regarding the subject of origin? Can this contribution by our modern authors be accepted as a valid *tafsir*?

2. The Research Objectives

This research addresses the following questions:

- How contemporary science impacts the Quranic interpretation of cosmogony.
- Advantages and challenges of scientific exegesis in relation to cosmogony.
- Suggestions for the advancement of scientific exegesis.

3. Research Methodology

In this section, we discuss two aspects relating to our methodology: verse selection and sources of the Quranic exegesis.

3.1 Verse Selection

There are many verses directly or indirectly related to the subject of cosmogony or cosmology in general. To focus our research, we will study these three verses (translation from Marmaduke Pickthall from <http://www.alquran-english.com>) and if necessary, other verses similar or closely related to them.

“Have not those who disbelieve known that the heavens and the earth were of one piece, then We parted them?...”

(Surah 21, al-Anbiyā’: 30)

“He Who created the heavens and the earth and all that is between, in six days, and is firmly established on the Throne...”

(Surah 25, al-Furqān: 59)

“We have built the heaven with might, and We it is Who make the vast extent (thereof).”

(Surah 51, al-Dhāriyāt: 47)

The three verses selected can be regarded as:

- al-Anbiyā’: 30 — The beginning of the cosmos.
- al-Furqān: 59 — The evolution of the cosmos.
- al-Dhāriyāt: 47 — The development of the cosmos.

3.2 The Sources of Quranic Exegesis

To achieve our purpose we will study and compare three types of sources as detailed below. The full list of works is listed in the Reference section.

i Classical Interpretation Sources

From early until medieval Islam, the materials that discuss Quranic cosmogony include:

1. *Tafsir* or Quranic commentaries: Our reference would be from the *tafsir* works of Tabari, Ibn Kathir, Zamakhshari and Razi. The first three represent the *naqli* or tradition-based exegesis while the last two represents the *aqli* or rational non-traditional *tafsir*.
2. *Tarikh* or Universal History: A genre which displays the effort of our early scholars to record the events from the beginning of time until the authors’ time. The sources for our comparison are Tabari’s *Tarikh al-Rusul wa al-Muluk* and Ibn Kathir’s *al-Bidayah wa al-Nihayah*.

3. **Traditional Cosmology:** Works that specifically discuss cosmological topics according to traditions (*hadith* and *athar*) or reports (*akhbar*). Our source here is al-Suyuti's *Hay'ah al-Saniyah wa hay'ah al-Sunnyah*. This work is thought to have been written during the period where traditional cosmology had matured and represents the cumulative knowledge or reports regarding this subject.

ii Modern Interpretation Sources

In our modern times, the subject of cosmogony discussed in:

1. *Tafsir*: Our oldest *tafsir* is Tantawi Jauhari [n.d.]. Other *tafsirs* include the Arabic *tafsir* of Said Hawa and the English *tafsir* of A. Yusuf Ali and Muhammad Asad.
2. **General books:** There are many books that discuss the subject of cosmogony in their contents usually those under scientific exegesis genre.
3. **Internet articles:** Cosmogony-related content usually found in websites whose motive appears to be inviting readers to Islam (*da'wah*) or exposing Quranic scientific miracles.

iii Modern scientific cosmogony

Cosmogony is not a popular term used by the scientific community or in scientific discussion. However the subject of origin is generally discussed in many cosmology or physics books. For our research, we refer to Popular Science genre works, not academic works or researches.

4. Overview of Quranic Cosmology

Religion is the first human attempt to decode the origin of the world [Davies 2008]. Quran has more than 700 verses urging readers to study the '*ayat*' or signs of Allah through nature and history. Al-Razi mentioned 30 terms in Quran related to 'think' or 'study' [Kamali 2006]. Heinen [1982] believes that discussion of natural phenomena including cosmology in the Islamic world occurred before the Graeco-Arabic Translation Movement. The driving force around this was the effort to understand and decipher Quranic verses relating to cosmology. Ibn Abbas for example is one of the prominent figures collecting information regarding cosmology from various resources or informants, also adding his own observations or interpretations.

The activities of these early scholars continued to other generations especially those who applied the *tafsir naqli* approach (exegesis based on reports). Later scholars inserted cosmological materials not only in the *tafsir* genre, but also the *Hadith* and *tarikh* genres including specific traditional cosmological works (in contrast to Greek or other empirical types of astronomy) for example al-Suyuti's *Hay'ah Saniyah* [Heinen 1982].

The Translation Movement during the Abbasid era brought the Greek's knowledge

(known as *ulum al-awwalin* or science of the ancients) into the Islamic world. But because little can be matched with the Quranic scheme of cosmogony generally, Muslim medieval astronomers did not base their physical cosmogony on the Quran. Our secondary materials [Nasr 1978; 1984; 2006] confirm this assumption.

Many modern *tafsirs* however treat Quranic commentaries with modern scientific knowledge. Even though the debate regarding the validity of using *tafsir al-ilmi* or the scientific exegesis approach still continues, the application is very popular and manifested in many published *tafsir* and non-*tafsir* works, by writers whose qualifications are rarely questioned (even non-Muslims' commentaries are accepted such as Maurice Bucaille). In our next discussion we will explore this trend in relation to the subject of origin.

5. Modern Scientific Cosmogony

There are two fields which contribute to the understanding of the origin [Davies 2008]:

1. Cosmology or the study of the nature and evolution of the universe
2. The study of the microscopic world within an atom or sub-particle physics.

The sequence of 'physical creation' and cosmic evolution can be chronologically summarized below [Davies 2008; Potter 2010; Greene 2008; 2011]:

1. 0 second — Singularity whereby all masses and energy are compressed in a single point smaller than an atom.
2. 10^{-43} sec — Plank epoch: The universe began in time. All the four physical forces still unified in a very high symmetry.
3. 10^{-36} sec — Inflation: The universe expands rapidly and exponentially. The temperature becomes 'cooler' preparing for energy to be transformed into matter.
4. 10^{-6} to 3 minutes — The era of particles: Quarks thought to be created (together with antimatter) during the first second. Protons and neutrons later combine and form the nuclei of simple elements.
5. 380,000 years — Somewhere around 300,000 years, the universe is cool enough for the formation of first neutral atoms of hydrogen and helium. A universe which was opaque becomes transparent when photons are able to cohere into streams of light. The period of the universe's Dark Age comes to an end.
6. 300 million years: The stellar formation from clouds of hydrogen and helium atoms. Nuclear fusion ignites and begins to radiates the previously dark space with lights.
7. 1 billion years — The formation of larger cosmic structures such as galaxies, clusters and superclusters. The explosion of older stars created heavier elements, preparing for the formation of planets and life.
8. 9 billion years — The formation of our solar system around 4.6 billion years ago.

The oldest fossil found on earth was believed to be at least 3.4 billion years old. Modern human appeared about 200,000 years ago. It is also believed, that around this time, the dark energy overcome the dark matter, and the expansion of universe became accelerated.

Our modern creation myth, Potter [2010] notes, is an account of a simple symmetrical structure evolving into complexity. It began with high-energy light transformed into matter. From atom to stars, from stars to biological life, from living organism to consciousness.

6. Quranic Interpretation of Cosmogony Verses

We compare here the interpretations of all the three verses to trace if modern theory’s impact our understanding of Quranic interpretation. For the source of the tafsir, please refer to section 3.2.

6.1 The Verse of al-Anbiya’: 30

Table below compares the interpretation of the verse 21:30 among classical and modern tafsir.

Classical Exegesis	Modern Exegesis
<ul style="list-style-type: none"> - The earth and skies were once joined and then split or broken into separate entities. - The act of separation is by the way of the skies being raised up. - The separation allows for raining from the sky and vegetation production from the earth. - In this specific verse, our authors did not refer to it as the beginning of the world. However, in the <i>tafsir</i> of Tabari and Ibn Kathir, this verse is referred to in the interpretation of 2:29. The earth and skies were once a vapor originated from the Water located below <i>al-‘Arash</i> or the Throne. During separation, the part that would become the skies was raised. The lower part was then dried up and became the earth. 	<ul style="list-style-type: none"> - This verse refers to two events: <ul style="list-style-type: none"> - The moment of creation i.e. the Big Bang. In this interpretation, this verse refers to the origin of the universe. - The formation of our solar system from nebulae matter. In this interpretation, the sky refers to our sun and all her planets. - The joining of celestial objects into a single entity may also refer to hydrogen domination in early creation which then formed into more complex structures. This interpretation is found only in Asad’s tafsir. - Yusuf Ali offers another interpretation: This verse refers to the unity of the physical law. He probably meant what physicists now refer to as Grand Unified Theory.

Apart from the description of the verse commented on by our modern authors above, they offer additional comments as follows:

1. The modern *tafsirs* do not just emphasize this verse as referring to the original moment of creation, but also point out that this process of ‘unification (*al-ratq*) and separation (*al-fatq*)’ is a recurring process. The earliest tafsir of this kind is by Syeikh Tantawi Jauhari [n.d.].

2. This verse refers to an event which was only recently known to modern science and therefore proves the miraculous nature of Quran. Even though this verse indicates the ‘knowledge of the unbelievers or *kafirun*’ many modern authors think that the unbelievers here refers to today’s generation. We may find this claim in Jauhari’s tafsir of this verse, but he meant the event as something else rather than the Big Bang as the theory was not yet established during his time.
3. Some modern authors think that the mere fact of some early commentators describing the unification and separation of earth and sky in their *tafsir* is a proof of their possessing contemporary knowledge.

6.2 The Verse of al-Furqan: 59

The table below compares the interpretation of verse 25:59 among classical and modern *tafsir*.

Classical Exegesis	Modern Exegesis
<ul style="list-style-type: none"> - Allah is the creator of the seven heavens the and earth. - The sky is everything that is above us. - ‘Day’ is interpreted as either the earth-bound period or God’s period in which the duration differs from ours referring to 32:5 and 70:4. - The phrase ‘heavens and earth and everything in between’ refers to all of His creation existing in this physical world. - Tabari in his <i>Tarikh</i> claims that most earlier scholars agreed that the creation of the heavens and the earth began on a Sunday (the first or <i>yomul Ahad</i>), and ended on a Friday (the day God put together – <i>jama’a</i> – His creation), and was established on the <i>Throne</i> on a Saturday. - Tabari in his <i>Tarikh</i> provides traditions on the creation chronology from Sunday to Friday which in a way is another version of the Genesis account. Ibn Kathir later also includes this kind of material both in his <i>tafsir</i> and <i>tarikh</i> but then criticizes them as <i>Israiliyyat</i> (Jewish-influenced sources). He however does not provide an alternative creation chronology. 	<ul style="list-style-type: none"> - The origin of time in creation points to the fact that it is created and has a creator. - The phrase “heavens and earth” represent the entire physical universe. Heavens (<i>al-samawat</i>) therefore refers to the entire universe minus the earth. But heavens might also refer to celestial objects such as galaxies, stars, suns and planets despite that all of them (except galaxies) have their own words in Quran. - ‘Between heavens and earth’ refers to everything above the earth such as the atmosphere and the rest of celestial objects including space. More recent interpretation (e.g. [al-Najjar 2006]) refers to this as the interstellar medium (such as gas, dust and radiation) or even the vacuum energy throughout space. - ‘Day’ refers to the relativity of time, phases of creation, the ‘cosmic day’, or an extended period of time such as an era, eon or epoch. - Modern authors, referring to many similarly themed verses, point to the fact that the formation of the heavens and the earth are parallel. - al-Najjar [2006] constructs ‘six stages of creation’ and this will be discussed in creation chronology.

The sequence or details of creation can be found in 41:9-12 and 79:27-33. These and other similar passages relating to creation (e.g. 11:07, 12:65, 71:15-16, 78 12) are frequently used by our authors to explain the creative process.

6.3 The Verse of al-Dhāriyāt: 47

The table below compares the interpretation of verse 25:59 among classical and modern *tafsir*.

Classical Exegesis	Modern Exegesis
<ul style="list-style-type: none"> - God's most expansive power! - The vastness of the heavens. 	<ul style="list-style-type: none"> - The expanding universe as understood by modern physics, whereby the distance increased or new spaces are created between parts of the universe at a speed faster than light. - In some extended period of time after the attractive gravity overcomes the repulsive force, this universe will collapse into what is termed as 'the Big Crunch.'

Modern authors see this as a proof of the Quran anticipating scientific findings regarding this matter. No corresponding interpretation of this is found in the classical works.

7. Chronology of Creation

We compare here the chronology of creation based on the Quran that appears in both classical and modern works.

7.1 Classical Creation Chronology

A brief description of the creation sequence appears in the *tafsir* of Tabari and Ibn Kathir in the interpretation of verse 2:29, and in much more detail in their *Tarikh* works. Suyuti's treatment of this in *Hay'ah al-Saniyah* however is very limited.

1. The earliest sequence I can trace in various reports presented in these works is the description of God in a fine cloud (*sahib al-raqiq, al-ghamam, ama'*) with no air (or space?) above and underneath. Razi in his *tafsir* rejected this *hadith*.
2. Tabari however insisted that God first created the Pen (*al-qalam*) and instructed it to write on the Tablet (*al-Lawh*).
3. God created the Footstool (*al-Kursiy*), Throne (*al-'Arash*) and Water (*al-Ma'*). The Throne was then placed above the Water.
4. When God wanted to start the creation of the heavens and earth, He brought forth the *dukhan* or vapor from the Water (*bikhār al-Ma'*) and then split it into the heavens and the earth.

5. A series of creations then occurred in six days culminating on Friday. Tabari here acknowledged the different details of particular activities during those days in the reports or information that he received.

7.2 Modern Creation Chronology

Not many authors in our reference list attempted to construct the chronology of creation based on the combination of both Quran and modern science. Bucaille [2003] presented some creation verses and concluded that Quran points to the parallel formation of both skies and earth. Based on 41:9-12, Yusuf Ali [1934] constructed the creation on a 'six days scheme'. The 'days' are interpreted as stages or phases with non-fixed interval period, no definite time-border and may overlap each other.

The phases are (1) the casting of our planet from cosmic matter; (2) its cooling and condensing; the growth of (3) vegetable and (4) animal life; and lastly the parallel growth of (5) the stars and (6) the solar system. The first stage seems to be referred to as a stellar explosion (an interpretation earlier suggested by Tantawi Jauhari in 1930). This is the process which he believes to be the interpretation of 21:30, which then produced the primordial gaseous state (*dukhan*) which he seems to suggest in stage no. 2.

Najjar [2006] offers another Quranic six-phases-scheme chronology which he must be basing on more recent cosmological findings: (1) The phase of primordial matter from which others were created (*marhalah al-ratq*); (2) The explosion of primordial matter (*marhalah al-fatq* or *al-dukhaniyah*) and the beginning of the universe's expansion; (3) The creation of various simple elements in the gaseous space such as matter, antimatter, and the nucleus of hydrogen, helium and lithium; (4) The condensation and formation of space objects due to gravity; (5) The formation of the Earth, its inner and outer structure and its atmosphere; (6) The creation of living things. In his interpretation of 21:30, he emphasizes the fact of a repetitive creation process whereby the phases of *ratq* and *fatq* are recurring i.e. the explosion of stars and the subsequent creation of other 'heavens and earths' as pointed out in 21:104, 14:48.

8. The Influence of Modern Science in Exegesis

Our earlier discussion shows the change of interpretation between old and new exegesis and demonstrates that this is largely as a result of modern science. Other than the chronology or narrative of creation, we demonstrate here some other examples of how modern science has changed the understanding and concept of Quranic terms and phrases.

8.1 Changes of Meaning

Some changes can be observed in modern exegesis relating to cosmogonical or cosmological terms in the Quran:

1. Heavens or Skies: Refers to everything other than earth e.g. all celestial objects, stars, the sun, galaxies, and space.
2. *Dukhan* (literally smoke): Refers to gas, dust or the nebulae matter in space.
3. *Falak*: Refers to the orbit of all celestial objects including the stars, the planets and also the galaxies.
4. *Mustaqarr*: The solar apex.
5. The Lamp (*al-Siraj*): Refers to the sun because of the object's energy generated by nuclear fusion.
6. The luminous (*al-Qamar al-Munirah*): Refers to the moon because the object reflects light instead of producing light.
7. The lower sky (*al-Sama' al-Dunyah*): The earth's atmosphere or the Milky Way Galaxy.

8.2 Changes of Concept

Some changes that can be observed in modern exegesis relating to cosmogonical or cosmological concepts in the Quran:

1. Seven firmaments (*sab'ah samawat*): 'Seven' does not refer to a definite numerical value but to plurality in general. It refers to the vast and complex structure of the whole cosmic system. 'Layers' of the heavens can be the earth's atmosphere, the stars, the galaxies, clusters of galaxies, the superclusters, the filament of galaxies, even the vacuum space.
2. Seven layers of the Earth: The different geological layers of the Earth.
3. 'Water' in 11:7 understood as the existence of H₂O molecules in the early creation, not water in its liquid state.
4. Darkness (*zulmah*) vs. light (*nur*) (e.g. 6:1, 79:29): Refer respectively to the period before the birth of the first stars and the period of after the birth of stars.
5. Earth being spread (e.g. 79:28): Also meant 'extended' referring to the extension of the area of the earth during its early formation.
6. Unseen (*Ghaib*): May refer to entities unseen by the naked eyes such as energy, waves, dark matter, dark energy, the physical laws.
7. Pairing (e.g. 36:36, 51:49): Refers to the symmetry in the physical world.

9. Approaches in Scientific Exegesis

Generally in performing scientific exegesis, our writers' major activity is matching the Quranic verses with the scientific theories. Some approaches can be traced among our authors regarding their interpretation in the subject of origin:

9.1 Direct Interpretation

Our authors interpret the verses directly according to the literal meaning or the context of the words or phrases, for example:

1. Unification and separation of heavens-earth (21:30) referred to as the Big Bang.
2. The expanding of the heavens (51:60) referred to as the expansion of the universe.
3. 'Heavens without visible supports' (13:2) referred to as gravity.
4. 'Living things from water' (21:30): The origin of life from water, or the dominant content of a living organism's cells.

9.2 Indirect Interpretation

Our authors interpret the verses not according to the direct meaning of the words, and may deviate altogether from the context originally understood, for example:

1. Darkness (*zulmah*) vs. light (*nur*) (6:1, 79:29): Referred to not as night vs. day but the era prior to or after the birth of first stars.
2. 'Appointed term' (39:5): Refers to the death of stars or other celestial objects.
3. 'The highest horizon' (53:7, 14): Refers to the maximum limit of sight or the visible world that humans can perceive.
4. 'Falling places of the stars' (56:75): The 'graveyards' of the stars, or the black holes.
5. Repeated creation (29:19-20): A recurring processes whereby stars or other objects are being recreated or cycled in nature.

9.3 Accidental Interpretation

There are two approaches in this type of interpretation:

1. The occurrence of nature or cosmological terms in Quran sometimes used by writers to give scientific comment on the verses which has nothing to do with the original context. An example is how the verses of al-Nur (24:36) are used by some writers to make comments on the physical theories regarding light.
2. The general statement of the Quran regarding God's power and mercy for example used to comment on the goldilocks nature of God's creation e.g. the distance of the earth from the sun, the size of the earth, the 'protection of earth' from external space objects etc. Harun Yahya is one of the authors who utilizes this kind of approach.

9.4 Confused Interpretation

Our authors are confused in understanding scientific theories and make wrong scientific comments, for example:

1. Some writers appear to understand that the 'unification of heaven-earth' as being joined or extensions of each other, not as one entity.

2. Misunderstanding that the Big Bang was an explosion in ‘space’ and not the creation of the space itself.
3. Misunderstanding that H₂O (related to 11:7) was the dominant element in the early universe.
4. ‘The heavens rolled up like a book’ (21:104) understood to be an outdated hypothesis of the ‘Big Crunch’.

10. Scientific Theories And Concepts That Are Ignored

Some of the theories and concepts related to cosmogony or cosmology which are not touched upon or not very popular among our authors:

1. Events that ‘triggered’ the Big Bang, or the ‘origin of the Big Bang’ itself. Related modern theories on this are Quantum Physics (e.g. the Quantum Landscape) and the String Theory (the Brane collision theory).
2. The difference of many ‘creation-related’ terms in the Quran e.g. *khalaqa*, *bada’a*, *fatara*, *ja’ala*, *badaa*, *baraa*, *sawwaa*, and *sawwara*. As there are many ways for modern science to understand how matter and living things are created or formed, this area is not explored much by our authors.
3. The difference between the observed, the observable and the entire universe in the application of Quranic terms and concepts. For example, should a layer (or layers) of the heavens be understood to include the non-observable universe?
4. Some crucial elements in the creation of the universe that are rarely discussed i.e. Higgs boson particle, dark matter and dark energy.

Because we need to ask our authors in order to know the real reasons why they left out these discussions, we may just speculate that:

1. These theories or concepts were not yet understood or difficult to be understood by the authors or general readers.
2. These theories or concepts were not attractive or marketable to the readers.
3. No verses can be matched with these theories or concepts.

11. Scientific Exegesis and Challenges

Studying the works that utilize the scientific exegesis approach, we list here the issues and concerns of this approach with relation to the subject of origin:

Authors are not familiar with the science of Quran (*ulum al-Quran*), its exegesis (*ulum al-tafsir*) and its history, for example using a modern dictionary as a premise to give new meaning to the Quranic terms. Both Bucaile [2003] and Abidin [2010] used modern Arabic dictionaries in their books. The established methodology of *tafsir* is using the oldest

sources when looking for the word meaning as Arabic, the same as any other languages, has undergone change over time.

The authors are not very familiar with the scientific theories that they are discussing. For example in Said Hawa's *tafsir*, he quoted how Said Ibn Jubair explained that the verse 21:30 meant that the sky and the earth were once joined, and God then separated them by raising the sky. Abidin [2010] claimed that this shows that Said knew the modern theory of origin which is actually different. This is also related to the 'confused interpretations' above. For example Danial claimed that H₂O was dominant in the early universe (as a commentary for 11:7) based on a research whose title might have confused him. This is of course incompatible with our knowledge on the rarity of this element in the Universe.

Authors not familiar with the methodology of modern science, for example Mohamed [2009] comments on Stephen Hawking as inventing theories about the cosmic origin. This demonstrates that some of the authors do not fully understand how modern cosmologists build their theories based e.g. on observation, facts and mathematics.

Authors are not familiar with anthropology especially on the history of religion and ideas. For example many of them claimed that the unification and separation of sky-earth (21:30) was not known before the modern scientific era. This is not true as this idea is common among Mesopotamian cultures [Hattstein 2008] and also other cultures around the world [Numazawa 1984].

Scientific theories are constantly changing. To claim that the new theories matched with particular verses may risk the interpretation being falsified in the future. For example before 2000, one of the scientific theories regarding the end of the universe is when it is collapsed when the attractive gravity is dominant (known as the Big Crunch). Many of our authors relate this to 21:104. Altaei even (according to his book of 1998) wrote a letter to Stephen Hawking claiming this particular verse as a proof of the divine source of the Quran. However, this theory was not acceptable later as we recently found out that the rate of expansion is accelerating.

There is no specific methodology in scientific exegesis. Each author practices their own methodology. This is to be expected as this approach is fairly new.

12. Scientific Exegesis and Hopes

Even though there are problems, we believe scientific exegesis should be continued. This approach has helped many modern readers understand Quranic messages based on contemporary knowledge. In Malaysia, this genre of book [Abidin 2010] is among the most popular in Malaysia.

However, after studying these type of works regarding the subject of origin, we wish to offer some suggestions to improve the scientific exegesis project:

1. A sound knowledge of both *tafsir* and science among our authors must be emphasized and improved.
2. Facilitating cooperation between many experts i.e. the scholars of tafsir and nature specific to the verses under discussion e.g. biologists regarding the verses of living organisms and cosmologists regarding the verses on the cosmos. Ramadhan 2009 refers to these two categories of scholars as *ulama al-nusus* (the textual scholars) and *ulama al-waqi'* (the context scholars).
3. Setting up a specific or standardized methodology for scientific exegesis. We may refer to how our past scholars for example created their *tafsir* methodology such as the rhetoric *tafsir* (or *balaghah*) by Zamakhshari or philosophical *tafsir* by Razi.

However, we should be aware that what really attracts non-Muslims to Islam is not what the Quran's 'scientific miracles' can offer, but the beauty of Quranic teaching manifested by beautiful societal practice of its values.

13. Conclusion

Modern exegesis is able to explain the subject of origin based on modern science. The Quranic cosmogony is better understood and more relevant to our modern readers only if we can describe it such a way that our contemporaries can understand it. However the approach of scientific exegesis or *tafsir al-ilmi* has many issues and needs to be greatly improved, on the part of the authors and also regarding its methodology. We finally close this article by quoting the words of Sheikh Tantawi al-Jauhari quoted by al-Najjar [2006] (translated by the author):

“Why are there thousands of fiqh scholars and why have so many fiqh books been written even though the verses regarding fiqh are not more than 150? Why have too many written on Fiqh, while too few have written on the science of nature even though every surah has verses regarding it?”

References

Primary References: Classical Works

- Fakhrudin Mohamad bin Umar bin Husain bin Hasan. n.d. *Mafatih al-Gharib*. Beirut: Dar al-Kutub al-Islamiyyah
- Mohamad bin Umar al-Zamakhshari. n.d. *Tafsir al-Khashshaf*. Dimashq: Dar al-Ma'mun li al-Turath
- Mohammad bin Jarir al-Tabari. 2005. *Jami' al-Bayan an Ta'wil al-Quran*. Beirut: Dar al-Salam.

Imam Jalaluddin al-Hafiz Aminuddin Abu al-Isma'il. 1970. *Tafsir al-Quran al-Karim*. Beirut: Dar al-Nafais.

Jaafar Mohamad bin Jarir al-Tabari. n.d. *al-Tarikh al-Rusul wa al-Muluk*. Beirut: Dar Ma'rifah.

al-Isma'il bin Umar. 1990. *Al-Bidayah wa al-Nihayah*. Beirut: Maktabah al-Ma'aruf.

Primary References: Modern Quranic Commentaries

Tantawi al-Jauhari. n.d. *al-Jawahir fi Tafsir al-Quran al-Karim*. al-Qahirah: Dar al-Salam.

Said Hawa. 1985. *al-Asas fi al-Tafsir*. Kaherah. Dar al-Salam.

Asad, M. 1980. *The Message of The Qur'an*. United Kingdom: The Book Foundation.

Ali, Y.A. 1934. *The Holy Quran: Text, Translation and Commentary*. Maryland: Amana Corp.

Primary References: Quranic Science Works

Abd al-Samad, M.K. 2000. *al-'Ijaz al-Ilmi fi al-Islam: al-Quran al-Karim*. al-Qahirah: al-Dar al-Misriyyah al-Lubnaniyyah.

Abidin, D.Z. 2010. *Quran Saintifik: Meneroka Kecemerlangan Quran Daripada Teropong Sains*. Kuala Lumpur: PTS Millennia.

Abu al-Khair, A.A. 2002. *Al-Quran & Sains Moden*. Johor Bahru: Percetakan Zafar Sdn. Bhd.

Afridi, R.K. and I. Navaid. 2006. *Quran on Science*. New Delhi: Anmol Publications Pvt. Ltd.

Ahmad Husaini, S.W. 1996. *The Quran for Astronomy and Earth Exploration from Space*. New Delhi: Goodword Press.

Ahmad, Y.H. 2009. *Ensiklopedia Kemukjizatan Sains dalam al-Quran & Sunnah*. (trans. by Hj. Abu Maula M.A, Hj. Abu Hana LC, Hj. Agus Irawan LC). Kuala Lumpur: Al-Hidayah Publication.

Altaie, M. B. 1998. *Khalq al-Kawn: Bayn al-Ilm wa al-Iman*. Beirut: Dar al-Nafais.

———. 2008. "Creation and the Personal Creator in Islamic Kalam and Modern Cosmology," *Humanity, the World and God, Studies in Science and Theology* vol. 11, pp. 149–166.

Bucaille, M. 2003. *The Bible, the Qur'an and Science*. New York: Tahrike Tarsile Qur'an Inc.

Ghozali, M. 2010. *The Profound Truth: Understanding Perfection*. Kuala Lumpur: Institut Terjemahan Negara Malaysia.

Heinen, A.M. 1982. *Islamic Cosmology: A Study of As-Suyuti's al-Hay'a as-Saniya fi l-Hay'a as-Sunniya with Critical Edition, Translation, and Commentary*. Beirut: Orient-Institut de Deutschen Morgenlandischen Gesellschaft.

- Mohamed Ghozali, A. R. 2009. *The Profound Truth: Understanding Perfection*. Kuala Lumpur: Institut Terjemahan Negara Malaysia Berhad.
- al-Najjar, Z. 2006. *Tafsir al-Ayat al-Kawuniyah fi al-Quran al-Karim*, 4 jld. al-Qahirah: Maktabah al-Shuruq al-Dawliyah.
- Purwanto, A. 2008. *Ayat-ayat Semesta: Sisi-sisi al-Quran Yang Terlupakan*. Bandung: Mizan Media Utama.
- Rahman, A. 1981. *Quranic Sciences*. Singapore: Pustaka Nasional Pte Ltd.
- al-Rawi, A.W. 2008. *Mu'jizat al-Quran al-Ilmiyyah fi al-Kawn*. Amman: Dar al-Ulum.
- Shahwan, R.S. 2009. *al-Dawabit al-Shar'iyah li Qadaya al-Ijaz al-Ilmi fi al-Quran wa al-Sunnah*. Omman: al-Maktabah al-Urduniyyah al-Hashimiyyah.
- at-Tarjumana, A. 1980. *The Subatomic World in the Quran*. Norwich: Diwan Press.

Quranic Science Works: Websites

- Miracles of the Quran*. <<http://www.miraclesofthequran.com>> (Access Date: 15/1/2013).
- The Scientific Miracles in the Holy Quran*. <<http://www.islam-guide.com/ch1-1.htm>> (Access Date: 15/1/2013).
- Oktar, A. *Harun Yahya's Official Site*. <<http://www.harunyahya.com>> (Access Date: 15/1/2013).

Primary References: Modern Cosmology Works

- Greene, B. 2008. *The Fabric of Cosmos*. Victoria: Penguin Books.
- Greene, B. 2011. *The Hidden Reality*. New York: Alfred A. Knopf.
- Hawking, S. 1988. *A Brief History of Time*. New York City: Bantam Dell Publishing.
- Davies, P. 2008. *The Goldilocks Enigma*. New York: Mariner Book.
- Potter, C. 2010. *A Portable History of the Universe*. New York: Happer Collins.

Other References

- Baba'ammi, M. M. 2008. *Mafhum al-Zaman fi al-Quran al-Karim*. Damascus: Al-Dar Wahy al-Qalam.
- Baljon, J. M. 1968. *Modern Muslim Koran Interpretation*. Leiden: E. J. Brill.
- Al-Dhahabi, H. 1979. *Al-Tafsir wa al-Mufasssirun*. al-Qahirah. Dar al-Suruq
- Fakhry, M. 2004. *A History of Islamic Philosophy*. New York: Columbia University Press.
- Hattstein, M. 2008. "Ancient Near Eastern Mythology," in von Laffert, J. (ed.), *Essential Visual History of World Mythology*. Washington, D. C.: National Geographic Society, pp. 54–59.
- Jansen, J.J.G. 1980. *The Interpretation of the Koran in Modern Egypt*. Leiden: E. J. Brill.
- Kamali, M.H. 2006. "Reading the Signs: A Qur'anic Perspective on Thinking," *Islam &*

- Science* 4(2), pp. 141–64.
- Mir, M. 2004. “Scientific Exegesis of the Qur’an: A Viable Project?,” *Islam & Science* 2(1), pp. 33–42.
- Nasr, S.H. 1978. *Introduction to Islamic Cosmological Doctrines*. London: Thames and Hudson Ltd.
- . 1984. *Science and Civilization in Islam*. Kuala Lumpur: Dewan Pustaka Fajar.
- . 2006. “The Question of Cosmogenesis: The Cosmos as a Subject of Scientific Study,” *Islam & Science* 4(1), pp. 43–59.
- Numazawa, K. 1984. “The Cultural-Historical Background of Myths on the Separation of Sky and Earth,” in Dundes, A. (ed.), *Sacred Narrative: Readings in the Theory of Myth*. Los Angeles: University of California Press, pp. 182–192.
- Ramadhan, T. 2009. *Radical Reform: Islamic Ethics and Liberation*. New York: Oxford University Press.
- Saddar, Z. 2008. “Weird Science,” *New Statesman* August 25, pp. 26–27.
- Tabari (Rosenthal, F. tr.). 1989. *The History of al-Tabari*. New York: State University of New York Press.
- Wolfson, H.A. 1976. *The Philosophy of Kalam*. Cambridge and London: Harvard University Press.