

Chapter 9

Creation in the Islamic Outlook and in Modern Cosmology

Mehdi Golshani

Introduction

The problem of creation has always been one of the major problems of human concern. But, prior to the 20th century it was mostly dealt with by theologians and philosophers. It was during the first quarter of the 20th century that scientific cosmology was developed and the problem of creation became the concern of scientific circles as well.

In this paper, we shall discuss creation from the Qur'ānic outlook and from the viewpoint of Muslim theologians, philosophers, and mystics. Then, we will discuss this problem from the point of view of modern cosmology, describing various schools of thought prevalent there. In this discussion we shall be brief because there are already some excellent reviews available. Finally, we shall have a comparative study between the views of the Muslim theologians, philosophers, and mystics, and the dominant schools of thought in modern cosmology. We will then draw some conclusions from this study and discuss the current state of affairs and cautions to be exercised in future studies.

Creation in the Qur'ān and the Islamic Tradition

According to the Qur'ān, everything is created by God:

God is the Creator of everything; is the One, the Omnipotent. (13:16)

God is not only the Originator of the universe, but is its Sustainer:

God is the Creator of everything, and He is in charge of everything. (39:62)

The Qur'ān asserts that everything depends on God:

Mankind, it is you who stand in need of God, and He is the All sufficient, the Praiseworthy. (35:15)

To emphasize this dependence, the next verse mentions that if God willed, He could take us away and bring in some new creation:

If He so wished, He could take you away and bring some new creation. (35:16)

It is also mentioned in the Qur'ān that God's effusion is never withheld and that His favors are uncountable:

Each We shall supply, these as well as those, with a gift from your Lord, and your Lord's gift was never withheld. (17:20)
... if you counted up God's favors, you would never [be able to] number them. (14:34)

There are verses in the Qur'ān which have been interpreted by some Muslim scholars to indicate continuous creation:

Everyone in Heaven and Earth asks for something from Him; each day He is at some task. (55:29)
Were we worn out by the first creation? Yet they are in a quandary about fresh creation. (50:15)

These are in fact, the verses which have been used by the Muslim mystics and Mullā-Sadrā to infer the doctrine of continual

creation. In the Qur'ān as well as the Bible (Book of John), the act of creation is identified with the word of God:

Originator of Heaven and Earth, and whenever He decrees something, He says to it: 'Be' and it is. (2:117)

Another important point is that there are frequent references in the Qur'ān to the multitudes of universes. For example:

All praise is for God, the Lord of the worlds.(1:2)

Some religious authorities and scholars have interpreted these references to "the worlds" as an indication of the existence of other worlds besides ours. For example, it is narrated from Imām Muhammad al-Bāqhir (A.S.):

Maybe you see that God created only this single world and that God did not create Homo sapiens besides you. Well, I swear by God that God indeed created thousands and thousands of worlds and thousands and thousands of humankind. You are in the last of these worlds and are the last of those human beings.¹

In his celebrated commentary on the Qur'ān, Fakhr al-Din al-Rāzī, the eminent Muslim theologian-philosopher, brings up the possibility of multiple worlds:

It has been proven by evidence that God, the Exalted, is capable of actualizing all possibilities. Thus, be He Exalted is capable of creating thousands and thousands of worlds beyond this world, each of which would be greater and more massive than this world ... and the argument of the philosophers for the uniqueness of this world is weak and poor, being based on invalid premises.²

Finally, it is recommended in the Qur'ān that we find out how God initiated the creation:

Do they not see how God initiates the creation, and then reproduces it? Surely that is easy for God. Say: 'travel in the earth and see how God initiated the creation'. Then God will create another creation; surely God has power over all things. (29:19-20)

Considering the possibility of other worlds – a possibility which can be inferred from the last two verses as well as other verses – this verse implies that we are instructed to find out through observation and reasoning, how our own world originated.

Muslim Theologians

The early Muslim theologians claimed that the world was created in time. Their main argument for this belief was that if the world did not originate in time, then it would be co-eternal with God. Thus, it could not be caused by God. They believed that eternity belonged exclusively to God, that everything else was temporal, and that createdness requires temporality.

Theologians' beliefs in the existence of an absolute beginning for time, requires that time be preceded by its non-existence. Thus, they talked about the world being preceded by an imaginary extension.

In his celebrated book, *The Incoherence of Philosophers*, al-Ghazālī, an eminent Asharite theologian, accused philosophers of infidelity on three accounts, the third one being their belief in the eternity of the world.

Pronouncing them infidels is necessary in three questions. One of them is the question of the world's pre-eternity and their statement that all substances are pre-eternal ...

These three doctrines do not agree with Islam in any respect. The one who believes them believes that prophets utter falsehood and that they said whatever they have said by way of [promoting common] utility, to give examples and explanation to the multitudes of created mankind. This is manifest infidelity which none of the Islamic sects have believed.³

Imām Fakhr al-Din al-Rāzī, another eminent Asharite theologian, differed from al-Ghazālī in this respect. In his view there is nothing in the Sacred books to indicate that the world had a temporal beginning,⁴ and he attributes this to the complexity of the problem. He writes, "The Great Prophets (A.S.) abstained from digging into this problem, and this indicates that it is so much difficult that human rationality cannot have access to it".⁵

Some of the later Muslim theologians, however, have supported the view of the Muslim philosophers who believed there was no temporal beginning to the world. In their view, the createdness of the world means its ontological dependence on God. To quote Lahijī:

In the narrations from our infallible Imāms, ... there is no explicit reference to either of the two views [temporality or eternity of the world], but the inferred meaning is that which implies dependence on the Creator alone ... the ancient and recent theologians believe in the temporality of the world. Sometimes, they even claim that there is a unanimous view on the temporal createdness. But the proof of this unanimity is difficult, and if there is a unanimity it is on the absolute createdness, without the condition of temporality or atemporality. Their rational arguments in this domain is quite weak, and the more recent philosophers have insisted on atemporality, and their doubt in this case is not without strength.⁶

Muslim Philosophers

The early Muslim philosophers, led by al-Fārābī and Ibn Sīnā (Avicenna), believed that the world had not originated in time, i.e. it is

eternal. In their view the creation in time would have the following implications:

1. It would mean that God is required for the creation of the world, but not for its sustenance.
2. It would necessitate a change in the Divine nature, which is not permissible for an immutable God.
3. It would require an interruption in God's effusion, which is inconsistent with the eternity of God's attributes, such as His creativity.

In this problem, both major schools of Islamic philosophy, Peripatetics and Illuminationists, had the same position. Tūsī, who was a Peripatetic philosopher, says in his commentary on Ibn Sīnā's *al-Ishārāt wa al-Tanbīhāt* that "since the First Principle was for them [i.e. philosophers] eternal and perfect in action, they asserted that the world, which is His action, is eternal ...".⁷ As Illuminationist philosopher, Suhrawardī says, "the effusion is eternal because the cause is unchangeable and immutable. Thus the world continues with His endurance".⁸

In their view, creation meant an ontological relationship and createdness meant ontological dependence, which has its roots in the contingency of every existent besides God. Thus, it is contingency, not temporality, that is the prerequisite for createdness. The Necessary Being (God) confers existence upon the contingent beings. Such a process is called creation.

These philosophers believed that there is neither a beginning nor end to time. Theologians, however, believed in the existence of two boundaries for time. Otherwise, they claimed, this would require that time be co-eternal with God. In Tusi's words, "the [temporal] createdness of the world requires its [i.e. time's temporal] createdness".⁹ Here, Tūsī speaks as a theologian.

In refuting philosophers' claims, al-Ghazālī pointed out that if philosophers had accepted the finitude of space, there is no reason why

they should not have accepted the finitude of time.¹⁰ In response, to al-Ghazālī, the contemporary Persian philosopher M. Mutaharī pointed to the difference between temporal and spatial dimensions: the elements of space can co-exist, but the elements of time are mutually exclusive. There is a relation of potentiality and actuality between the elements of time, but there is no such relation between the elements of space.¹¹ Einstein, whose special theory of relativity has been used by some people to negate any distinction between space and time coordinates, disapproved the identification of time as a dimension of space. "Time and space are fused into one and the same continuum, but this continuum is not isotropic. The element of spatial distance and the element of duration remain distinct in nature."¹²

What we mentioned above were the beliefs of the major schools of Islamic philosophy. But there were some individual philosophers in the Islamic world whose ideas on the problem of the creation of the world were different. For example, al-Kindī argued that the world is created in time.¹³ Similarly, Maimonides claimed that the Aristotelian arguments for the eternity of the world were not conclusive arguments and that temporal creation is a more plausible alternative.¹⁴ On the other hand, Muhammad ibn Zakarīyya al-Rāzī believed in five eternals: God, the universal soul, first matter, absolute space, and absolute time.¹⁵ But, before Mullā-Sadrā, the dominant view was atemporal createdness and it was shared by both Peripatetic and Illuminationist philosophers. Nevertheless, Ibn Sīnā's concluding words on this problem are very cautious and extremely instructive. In his *al-Ishārāt wa al-Tanbīhāt*, which was one of his last books, he describes the views of various schools of thought on the problem of creation. Then, he leaves the choice of which is the correct view to the readers, but gives three recommendations:

1. To be firmly committed to the unity of God
2. To avoid prejudices
3. To use their intellectual capacity

In his words, “thus, the schools of thought on this problem are what we described. You must choose one of them, after you have subscribed to the unity of God, using your faculty of intellect, rather than your prejudices”.¹⁶

Muslim Mystics

Muslim mystics introduced the doctrine of the recreation (or perpetual motion) of the world at every instant. According to this doctrine, the universe is annihilated and recreated at every moment, i.e. there is continuous creation going on. One of the earliest exponents of this doctrine is the Persian mystic – philosopher ‘Ayn al-Qudāt Hamadānī of the 12th century. In his view, everything which comes into being is going to be annihilated instantaneously and then it is immediately recreated again. Thus, God is not only the originator of the universe but its constant Creator. Everything derives its existence from Him. But, the ontological relationship between the two must be renewed at every moment.¹⁷ This renewal is due to two facts:

1. The ontological contingency of all things.
2. Constant effusion from God.

Thus, every existent, due to its ontological contingency, takes off the garment of existence once it comes into being. But at the same time, God’s effusion confers upon it a new garment of existence. We do not see this renewal, because it takes place instantaneously. Hamadānī offers a good analogy:

Small children, observing a lamp burning continuously, would naturally think that what they see is one single flame. But the grown ups know very well that it is a series of different flames appearing and disappearing moment by moment. And from the viewpoint of the mystics this must necessarily be the case with everything in the world except God.¹⁸

Later Mystics, following the lead of Hamadānī and the eminent mystic Ibn Arabī, advertised the thesis of recreation. Here I simply quote two well-known Persian mystic – poets, Shabistarī and Rumi. In Shabistarī's words (1317):

The world is this whole, and in every twinkling of an eye,
it becomes non-existent and endures not two moments.
There over again another world is produced,
every moment a new heaven and a new earth.
Things remain not in two moments,
the same moment they perish, they are born again.

In Rumi's words:

Every Instant then thou art dying and returning,
Mustafa [the prophet] declared that this world is (but) a moment.
Every moment the world is renewed, and we
are unaware of its being renewed whilst it remains [the same in appearance].
Life is arriving a new, like a stream,
Though in the body it has the same semblance of continuity.

Mullā-Sadrā

We have separated the discussion of Mullā-Sadrā's view on this problem from the rest of Muslim philosophers because he established an independent school of thought in which he took some elements from various schools of philosophy – from mystics, the Qur'ān, and the Islamic tradition – and combined them to develop his own school of philosophy, the so-called *al-Hikmat al-Muta'aliyah*.

Mullā-Sadrā's approach to the problem of creation is based on his doctrine of transsubstantial motion. Earlier Muslim philosophers had restricted motion to some categories of accidents (e.g. quantity and quality), but they had denied the possibility of motion in the category

of substance. Mullā-Sadrā argued that changes in an accident requires changes in the substance to which the accident belongs, because accidents have no independent existence of their own.

According to Mullā-Sadrā, the essence of everything is continually renewed through the process of transsubstantial motion. In other words, every existent is in constantly renewed creation at every moment.

There is absolutely no ipseity or individual – be it celestial or elemental, simple or composite, substance or accident – but that its non-existence precedes its being in time, and its being likewise precedes its non-existence in time. In general, every body and every bodily thing whose being is in any way connected with matter is constantly renewed in its ipseity and impermanent in its being and its individuality.¹⁹

All existents have this constant renewal in their nature. Thus, every existent is different now from what it was before. What it is now was non-existent before. Thus, the doctrine of *creatio ex nihilo* holds at each instant, i.e. we have a continuous effusion of existence from the ultimate source of existence.

Mullā-Sadrā confirms the doctrine of temporal createdness of the Muslim theologians, but unlike them he does not restrict temporal creation to a specific time in the past. Rather, it is a continual re-creation, without having an absolute beginning in the past. Thus, as earlier Muslim philosophers had emphasized, while nothing is eternal, there is no absolute beginning to time:

Thus, the continuation of the effusion of the absolute bountiful and the eternity of the creation of the true Creator became clear from what we said ... But the continuation of the effusion of the Creator and His creation does not require the eternity of contingents.²⁰

In short, in Mullā-Sadrā's view, nothing precedes time and motion but God.

According to Mullā-Sadrā all Divine religions believe in the createdness of the universe, and by that they mean temporal createdness. The creation did not take place in time, but occurred with time. In fact, time is the measure of the universal transsubstantial motion. The universe can be considered as an infinite series of continual creations. In Mullā-Sadrā's view the whole universe is nothing but its parts, and the [temporal] creation really refers to them, rather than to the whole. "The whole has no existence besides the existence of the parts. The parts are numerous. Thus, their [temporal] creation is numerous."²¹

The major difference between Mullā-Sadrā's view and that of Muslim Mystics, in the problem of creation, is that for Mullā-Sadrā the state of the universe at any instant becomes matter for new forms which are conferred upon it by God, while for the Muslim Mystics the universe is annihilated and recreated at every instant. The first is called "dressing after dressing" and the latter is called "dressing after undressing".

Modern Cosmological Models of Creation

Big Bang Model

Scientific Cosmology started with Einstein's 1917 celebrated paper, "Cosmological Considerations on the General Theory of Relativity".²² In this paper Einstein applied his general theory of relativity to the universe. Einstein's equations have different solutions corresponding to different distributions of fields and matter but the theory by itself cannot select a particular one. Among them, there are solutions that predict an expanding universe from extremely hot and dense conditions at $t=0$.

From 1917 until the presentation of E. Hubble's results in the 1930's, the dominant view was that our universe is a static one. There

were two static models available: Einstein's closed universe and de Sitter's open, infinite, and empty universe.

In 1922 Alexander Friedman, and in 1927 George Lemaitre, presented solutions of Einstein's equations which indicated the expansion of the universe. Einstein first rejected Friedman's solution because of its prediction of singularity but in 1923 he accepted Friedman's solution.

In 1929 Hubble noticed a red shift in the spectra of galaxies, which was proportional to their distance from our galaxy. This was interpreted as a "Doppler effect", which meant that galaxies are receding from our galaxy with a speed proportional to their distances, i.e. the universe is expanding.

In the late 1940s some people including Fred Hoyle, Herman Bondi, and Thomas Gold presented different versions of the so-called "steady state theory", which assumed that the universe is both spatially and temporally homogeneous, i.e. it is eternal. Hoyle explicitly mentioned that the creation could not be causally explained and that the assignment of a beginning to the universe is against the spirit of scientific enquiry. "It is against the spirit of scientific enquiry to regard observable effects as arising from 'causes unknown to science' and this in principle is what creation-in-the-past implies."²³

During 1950s both the Big Bang theory and the steady state theory were popular. The discovery of the microwave background radiation in 1965 gave solid support to the Big Bang theory and weakened the steady state theory.

In the late 1960s several people, notably Hawking and Penrose, proved that under some very reasonable assumptions cosmological models governed by general relativity exhibit a singularity at $t=0$, which means that the universe must have started in a space-time singularity. The Big Bang could be combined with infinite time, leading to an oscillating universe, i.e. an infinite series of expansions followed by contractions. The oscillating universe was popular with some physicists and cosmologists, but it has become less popular on physical grounds.²⁴

Reactions to Standard Big Bang Model of Universe

There have been six major reactions to the Big Bang model of the universe.

Creation ex nihilo The theistic interpretation of the standard Big Bang cosmology is, to paraphrase W.L. Craig, the classical doctrine of creatio ex nihilo: that a finite time ago God brought the universe into being with a material cause and fashioned the cosmos according to His design. The argument for the existence of God can be expressed in the forms of the following syllogism: a) whatever begins to exist has a cause; b) the universe began to exist; c) therefore, the universe has a cause.²⁵ This interpretation of Big Bang was welcome by Pope Pius XII in 1951, and some scientists, philosophers, and theologians throughout the Muslim and Christian world have embraced it with enthusiasm. For example, Ted Peters sees the doctrine of creatio ex nihilo in Christian theology as in “consonance” with the problem of $t=0$ in Big Bang cosmology. He states, “If we identify the concept of creation out of nothing with the point of temporal beginning or perhaps the source of the singularity, we have sufficient consonance with which to proceed further in the discussion”.²⁶

Singularity with cause The other prominent reaction to Big Bang has been by those who saw Big Bang as a support for theism. As Paul Davies put it, “a singularity is the nearest thing that science has found to a supernatural agent”.²⁷ These people have tried to eliminate the singularity at $t=0$ by various physical and mathematical tricks including an appeal to various theories of quantum gravity. Here, there are models with a background space-time in which the universe emerges as a quantum fluctuation of vacuum, and models in which space-time arises out of pure chance from a space with no boundary.

Singularity with no cause Some scholars have accepted the singularity and the existence of temporal beginning to the universe, but they deny

that the creation of the universe needs a cause. Q. Smith, e.g. believes that the universe, including the initial singularity sprang into being out of nothing without a cause:

There is no good reason to believe that there is a sound a posteriori or a priori argument for a cause of the big bang. Thus we reach a general conclusion: there is no philosophy of big bang cosmology that makes it reasonable to reject the fundamental thesis of big bang cosmology: that the universe began to exist without a cause.²⁸

Ontological Dependence on God Some scholars believe that the doctrine of creatio ex nihilo does not imply temporal createdness; rather, it implies ontological dependence on God. Thus, the singularity at $t=0$ should not be identified with the doctrine of creatio ex nihilo. In Arthur Peacocke's words:

The principal stress in the Judeo-Christian doctrine of creation is on the dependence and contingency of all entities and events, other than God himself: it is about a perennial relationship between God and the world and not about the beginning of the Earth or the whole universe at a point of time.²⁹

Ian Barbour has the same view. He writes, "the doctrine of creation is not really about temporal beginning but about the basic relationship between the world and God".³⁰ J. Polkinghorne also shares this view; he writes, "theology could have lived with either physical theory, for the assertion that God is Creator is not a statement that at a particular time he did something but rather that at all times he keeps the world in being".³¹

Creatio Continua In the last 40 years, the old idea of continuing creation (*creatio continua*) has been revived in different senses. *Creatio continua* refers to the idea of change within an already existing matter. In the words of Ian G. Barbour, "continuing creation expresses

the theme of God's immanence and participation in the ongoing word. God builds on what is already there; each successive level of reality requires the structure of lower levels".³²

Creatio continua also means the continuation of the original creation out of nothing. As Wolfhart Pannenberg put it:

The creatio continua formula presupposes the strict conception of creatio ex nihilo in as much as it characterizes God's preserving activity as the continuation of the creation out of nothing. For this reason alone the idea of a continuing creation cannot be set in opposition to the creatio ex nihilo formula.³³

For Philip Hefner, creation refers not only to the original creation, but it also includes God's continuing sustenance of the world:

Creation for Christian theology is by no means limited to protology. It is not limited to what happened at the beginning when time was first created. Creation also refers to God's ongoing sustaining of the world. Every moment of the world's existence depends upon the ongoing grace of God.³⁴

The last sentence reminds one of the Muslim mystics and Mullā-Sadrā.

Creatio Continua also means that at every moment the universe depends on God, irrespective of whether there was an absolute beginning. In the words of Keith Ward:

The Big Bang has not the slightest theological significance. It does not matter whether the world began with a bang or whether it began at all. It might always have been there. Theologians have always agreed that this does not make any difference. When you say that God 'creates' the Universe, you just mean that everything – however long it has been there – always depends, at every moment of time, upon God. That is all you mean. It's a pity that some physicists use the word 'creation' when they actually mean 'origin' of the Universe. Creation isn't at the beginning, it is now and always.³⁵

He also states, "but a more satisfactory notion of creation is that God at every moment sustains the universe, so that every moment is a moment of creation".³⁶

Creatio continua refers to the continuous creatio ex nihilo. This is exemplified, e.g., by the steady state theory of Hoyle et al., in which there is continual creation of matter out of nothing. As Bondi put it, "there is going on everywhere and at all times a continual creation of matter, the appearance of atoms of hydrogen out of nothing".³⁷

Finally, some people admit the temporality of the universe but they believe in the eternity of the laws of physics and think that these laws are enough to put the universe into existence. Paul Davies elaborates on this position:

The possibility that given the laws of physics, a universe can appear spontaneously, rests on the 'prior' existence of these laws of physics. Given, the laws, the universe can take care of itself. But where do the laws come from?

... the laws are logically prior to the universe. If this were not so, we should have to suppose that the whole package, the universe plus laws, just popped into existence for no reason. So, I contend that the laws enjoy some sort of timeless transcendent, Platonic existence.³⁸

Quantum Cosmological Speculations

As we mentioned, the singularity theorems indicate that all of the models of an expanding universe that satisfy certain reasonable assumptions start with a singularity, at which the density and temperature become infinite and Einstein's equations cease to be valid. Einstein, himself, had the following insight about the initial singularity:

For large densities of field and matter, the field equations and even the field variables which enter into them have no real significance. One may not therefore assume the validity of the equations for very high density of field and matter, and one may not conclude that the 'beginning of the expansion'

must mean a singularity in the mathematical sense. All we have to realize is that the equations may not be continued over such regions.³⁹

To overcome this obstacle, some people have argued that as we go backward toward the singularity, when we go beyond Planck's time, the first 10^{-43} seconds of the early universe, the universe becomes ultra-microscopic and the quantum mechanical effects become important. Thus, we have to use a proper quantum theory of gravity. There is a hope that this theory will not involve singularities.

During the last three decades, the standard Big Bang model has been replaced by models in which the universe arises by pure chance from a quantum mechanical vacuum or from a space-time with no boundary. Here we say a few words about some of these models.

1. In 1973 Edward Tryon suggested that our universe originated as a quantum fluctuation of the vacuum – the vacuum of some larger space in which our universe is embedded.⁴⁰
2. In the early 1980s, Alexander Vilenkin of Tufts university introduced a model in which the universe was created through a quantum tunneling effect – a tunneling from a state with no classical space-time to a de-Sitter space.⁴¹
3. In 1983, Hartle and Hawking suggested a model in which the initial singularity is avoided by making time less well-defined in the early universe.⁴² Starting from the Wheeler-Dewitt equation, they tried to construct the wave function of the universe which represents the amplitude for the creation of the universe from finite quantum fuzz. In their model, the space-time diagram of the universe does not start from a single point, but from a curved surface with no boundary, i.e. their universe has a finite past but no initial singularity. In this no boundary proposal there is no beginning for the universe, and therefore Hawking sees nothing left for the Creator to do. In Hawking's words, "there would be no singularities at which the laws of science broke down, and no edge of space-time at which one has to appeal to God or some new law to set the

boundary conditions for space-time".⁴³ In another place he states, "but if the universe is really completely self-contained, having no boundary or edge, it would have neither beginning nor end. What place, then, for a Creator?".⁴⁴ But, as Don Page pointed out,⁴⁵ Hawking's objection does not apply when one holds that God created the universe and sustains it, as it is believed in the monotheistic religions, rather than just interfering at the beginning. Hawking admits that the existence of an edge for space-time implies the existence of God, which is what the early Muslim theologians believed. But he departs from their position, by denying the existence of this edge. Nevertheless, as John Polkinghorne pointed out, the 'no boundary' condition of Hawking is itself a boundary condition.⁴⁶ Other cosmologists (e.g. Linde and Penrose) have imposed other boundary conditions.

Islamic Cosmological Doctrine vs. Modern Cosmological Models

The Islamic schools of thought about the creation could be summarized in the following categories:

1. Theologians' beliefs in temporal createdness of the universe.
2. Philosophers' beliefs in the eternity of the world and its ontological dependence on God.
3. Mystics' and Mullā-Sadrā's views about perpetual creation (continual recreation) of the world.

All of these views are present in the current schools of cosmological thought – among cosmologists, theologians, and philosophers. For example, the temporal createdness of the universe was hailed by E. Whittaker, the eminent British physicist in 1951; today, it is seriously defended by physicist H. Ross and philosopher W.L. Craig. It is amusing that even those, like Hawking, who deny temporal createdness of the universe, share Muslim theologians'

understandings of a created universe. Similarly, the view of the Muslim philosophers about the ontological dependence of the world on God is shared by some contemporary scientists, theologians, and philosophers (e.g. P. Hodgson and A. Peacocke). Likewise, the doctrine of continual reaction of the Muslim mystics and Mullā-Sadrā is echoed in the thesis of continuous creation of some contemporary Christian theologians, though in different senses. The closest view to Mullā-Sadrā's is that of K. Ward.

Finally, the idea of the existence of multiple worlds suggested by some Qur'ānic verses and Islamic traditions is seen in the work of some modern cosmologists, who are not necessarily theists but believe in this idea either on physical grounds or to remove the need for God. The idea of many worlds has been brought up in modern cosmology in several contexts (the reduction of the wave function of the universe, oscillating model of the universe, anthropic principle, etc.). One of the most recent ones is the chaotic inflationary scenario. In this scenario, the universe started in a chaotic state. Then, some regions underwent inflation and the amount of inflation was different from region to region. Each inflated region resembled a bubble with smooth conditions.⁴⁷ The universe we live in is one bubble among other bubbles, with a particular set of fundamental constants. In Andrei Linde's version of chaotic inflation, inflation is a potentially self-reproducing process.⁴⁸ The fluctuations produced by inflation induce further inflations in small subregions of the inflating bubbles. The whole network of inflating bubble universes need not have any beginning. Of course, the eternal inflationary scenario is not testable by observations, and in this scenario the universe is different beyond our horizon of possible observations. Thus, it is not possible to answer questions about the origin of the whole universe.

Conclusion

In my opinion, there is a lot of confusion and there are a lot of fallacies concerning the problem of creation, especially among modern cosmologists. This, in my humble view, is the result of their lack of philosophical understanding. The problem of creation is not a matter of physics alone. It needs theological and philosophical reflection as well. Here, I would like to summarize some of the misunderstandings prevalent among the practitioners of modern cosmology.

The use of Big Bang cosmology for the affirmation or the denial of temporal createdness is a clear misunderstanding of both cosmology and creation (as understood in theology and philosophy).

We still do not have a successful unification of quantum theory and general relativity, i.e. a coherent quantum theory of gravity. All of the current works on quantum cosmology are based on assumptions that are thought to be valid when we get that theory. But, as Isham pointed out, it is not obvious that:

Relativity can be quantized in the way it has been done so far.

A unification of general relativity and quantum theory can be achieved without invoking radical conceptual changes in either.

The prevalent concepts of space, time and matter remain intact in the region of the Planck length.

The concept of probability can be extended to quantum cosmology without getting into conceptual problems.⁴⁹

The beginning implied by the Big Bang models is not necessarily an absolute beginning, because: a) the initial singularity is predicted by present theories, which are not valid at the Big Bang anyhow; and b) even if there were an absolute beginning to the world, science could never reveal it. In Saint Thomas Aquinas' words, "we hold by faith, and it cannot be proved by demonstration that the world did not always exist ... the reason being that the newness of the world cannot be demonstrated by the word itself".⁵⁰ And, in the words of J.M.

Zycinski, "there are no physical or philosophical means that would make it possible to prove that at this very moment our universe emerged from ontologically understood nothingness".⁵¹ The reason is that we cannot say what happened before the Planck time (about 10^{-4} seconds after the Big Bang), and we cannot ever get to $t=0$. So, the identification of the initial singularity with *creatio ex nihilo* is doubtful. As Hawking and Ellis put it, "the results we have obtained support the idea that the universe began a finite time ago. However, the actual point of creation, the singularity, is outside the scope of presently known laws of physics".⁵²

All models of Big Bang assume infinitely dense and hot matter plus certain physical laws. Thus, as Isham pointed out, these models describe "the creation of the universe from an initial point", rather than a "creation from nothing".⁵³ Thus, the Big Bang is really a change, rather than a creation.

The vacuum that quantum cosmologists talk about is a particular state of quantum fields, subject to many constraints, including the principles of quantum mechanics and the principles of logic. Thus it should not be confused with metaphysical nothingness which is implied in the *creatio ex nihilo*.

The Big Bang inferred from the present expansion of the universe could indicate only the beginning of one world – our own world. There could have been other worlds before the present one, or there could be others alongside the present one, as some of the inflationary models claim. M. Mutahhari, the eminent Persian philosopher expressed the matter elegantly. He writes, "physicists could be right that 10 billion years ago the world did not exist with the present laws. But, how do we know that there were not other worlds before, with different laws".⁵⁴ And, in the words of Peter Hodgson, the British nuclear physicist, "the cosmic singularity seems to be the ultimate limit of science. This singularity is not necessarily the beginning of the universe; there may have been a previous contraction".⁵⁵

Some contemporary cosmologists have been very arrogant in making big claims. For example, some cosmologists claim that they can explain the universe completely through science alone, and that it is self-created. Had we a successful and complete quantum theory of gravity, these claims could, in some sense, be justified. But we do not have such a theory; rather, we have highly speculative sketches of the alleged general features of this theory – features that are based on our present fragmentary knowledge. Chris Isham has put the matter elegantly:

Major conceptual problems arise when trying to apply quantum theory to the universe as a whole. This problem is so severe that many highly respectable theoretical physicists think that the whole subject of quantum cosmology is misconceived.

It follows that theories of the quantum origination of the universe are highly speculative and do not have anything like the scientific status of, say, even the more exotic branches of modern elementary particle physics.⁵⁶

When our major theories, such as quantum theory, have conceptual problems and we do not have a successful marriage of quantum theory and general relativity, it is unwise to make conclusive inferences from them. The American astrophysicist J. Bahcall has articulated this point:

I personally feel it is presumptuous to believe that man can determine the whole temporal structure of the universe, its evolution, development and ultimate fate from the first nanosecond of creation to the last 10^{10} years on the basis of three or four which are not very accurately known and are disputed among the experts. That I find, I would say, almost immodest.⁵⁷

The grand masters of physics were very humble and cautious when the problem of the origin of the universe was concerned. For example, in 1930, the eminent physicist J.J. Thomson gave the following warning:

I think this is a warning against taking too seriously speculations about either the remote past or the remote future of the universe, founded as they must on the physics of the moment.⁵⁸

This warning was given at a time that both major theories of physics, general relativity and quantum mechanics, were taken to be beyond any doubt and the end of science seemed to be in sight, and Gödel's incompleteness theorem had not arrived on the scene. According to this theorem, in any axiomatic system which includes arithmetic, there are statements whose truth or falsity cannot be decided within the system. Scientific cosmology is such a mathematical system. Thus, we cannot expect it to answer all of our cosmological questions. Serious conceptual problems of quantum mechanics plus the inability of physicists, so far, to give a coherent formulation of quantum gravity plus the existence of Gödel's theorem make it necessary to avoid any conclusive claims about the origin of universe. Some physicists (among them both theists and atheists) believe that science will finally settle this problem by itself. In the words of Ian G. Barbour:

It is equally impossible to imagine a beginning of time or an infinite span of time. Both are unlike anything we have experienced. Both start with an unexplained universe. I will agree that the choice of theories could be made on scientific grounds alone, and that the difference between them is only of secondary importance religiously.⁵⁹

However, I do not believe that science alone can ever settle the problem of the absolute beginning of the universe, though I agree with Barbour that either way (temporality or atemporality of the universe) is of secondary importance religiously.

I, personally, recommend the following strategy: we should explore our universe through science as much as we can, but we must avoid making claims about the absolute origination of the universe on physical grounds. Philosophy and theology can save us from making unsound exaggerated scientific claims, and can give us a proper

metaphysical framework for our science and a ground for our being. In this framework, the description of the physical aspects of the universe is left for scientific investigation, but the ultimate explanation of the universe is provided by God. Robert J. Russell puts the matter elegantly:

Whether the origin of the universe as we know it involves a previous quantum superspace, or whether the universe had an absolute beginning 15 billion years ago, the universe is contingent: it does not seem to include the grounds for its own existence, it does not offer an ultimate explanation of why anything at all exists in the first place, and therefore it points to that on which all beings necessarily exist – God.⁶⁰

Notes

¹ al-Saduq, *al-Tawhid* (Qum: Manshourat Jamiah al-Mudarresin fi al Hawzah al-Ilmyyah, 1398 H.) 277.

² al-Rāzi, Fakhr al-Din, *al-Tafsir al-Kabir*, vol. 1 (Beirut: Dar Ihy al-Turath al-Arabi, no date specified), 6-7.

³ al-Ghazālī, Abu Hamid Muhammad, *The Incoherence of the Philosophers*, trans. M.E. Marmura (Provo, Utah: Brigham Young University Press, 1977), 230.

⁴ al-Rāzi, F., *al-Matalib al-Aliyah min al-Ilm al-Ilahi*, vol. 4 (Beirut: Dar al-Kitab al-Arabi, 1987), 29.

⁵ *Ibid.*, 33.

⁶ Fayyaz Lahijī and Abd al-Razzaq, *Gowhar-e Murad* (Tehran: Irshad-e Islami, 1372 H.), 229-230.

⁷ Abu Ali Ibn Sinā, *al-Ishārāt wa al-Tanbihāt*, vol. 3 (Tehran: Heidari, 1379 H.), 82.

⁸ Shahab al-Din Suhrawardī, *Hikmat al-Ishraq in Majmouah Mosannefat Sheikh Ishraq*, vol. 2 (Tehran: Moassesah Motaliat we Tahqiqat-e Farhangi, 1372 H.), 181.

⁹ Nasir al-Din Tūsī, *Tajrid al-Iteqad* (Qum: Maktab al-Aalam al-Islami, 1407 H.), 185.

¹⁰ al-Ghazālī, *op. cit.*, 32-36.

¹¹ M. Mutahhari, *Harakat wa Zaman dar Falsafeh-e Islami*, vol. 3 (Tehran: Intesharat-e Hikmat, 1375 H.), 234-235.

¹² W.L. Craig and Q. Smith, *Theism, Atheism, and Big Bang Cosmology* (Oxford: Clarendon Press, 1993), 294.

¹³ S.H. Nasr and Leaman, *History of Islamic Philosophy*, vol. 1 (London: Routledge, 1996), 110.

- ¹⁴ Ibid., 688.
- ¹⁵ M.M. Sharif, *A History of Muslim Philosophy*, vol. 1 (Wiesbaden: Otto Harrassowitz, 1963), 441.
- ¹⁶ Ibn Sīnā, op. cit., vol. 3, 138.
- ¹⁷ T. Izutsu, *Creation and the Timeless Order of Things* (Ashland, Oregon: White Cloud, 1994), 151-158.
- ¹⁸ Ibid., 167.
- ¹⁹ J.W. Morris, *The Wisdom of the Throne* (Princeton: Princeton University Press, 1981), 119-120.
- ²⁰ Mullā-Sadrā, *al-Hikmat al-Muta‘āliyah fī al-Asfar al-Aqliyyah al-Arbaah*, vol. 7 (Beirut: Dar Ihya al-Turath al-Arabi, 1981), 305-306.
- ²¹ Ibid., 297.
- ²² A. Einstein, "Cosmological Considerations on the General Theory of Relativity," in *The Principle of Relativity*, eds. W. Perrett and G.B. Jeffery (New York: Dover, 1952).
- ²³ F. Hoyle, "A New Model for the Expanding Universe", *Monthly Notices of the Royal Astronomical Society*, 108 (1948): 372-382.
- ²⁴ W.L. Craig and Q. Smith, op. cit., 47-56.
- ²⁵ Ibid., 284.
- ²⁶ Ted Peters, "On Creating the Cosmos" in *Physics, Philosophy and Theology*, Bob Russell, William R. Stoeger, and George Coyne (eds), (Vatican City State: Vatican Observatory, 1988), 291.
- ²⁷ Paul Davies, *God and the New Physics* (London: Penguin Books, 1988), 55-56.
- ²⁸ Q. Smith, "Did Big Bang Have a Cause", *British Journal for the Philosophy of Science*, 45 (1994): 666.
- ²⁹ A.R. Peacocke, *Creation and the World of Science: The Bampton Lectures, 1978* (Oxford: Clarendon, 1979), 78.
- ³⁰ Ian G. Barbour, *Issues in Science and Religion* (New York: Harper and Row, 1966), 368.
- ³¹ John Polkinghorne, *Science and Creation* (Boston: Shambhala, 1998), 54.
- ³² Ian G. Barbour, *Religion and Science: Historical and Contemporary Issues* (San Francisco: HarperSanFrancisco, 1997), 214.
- ³³ Quoted in Mark Worthing's *God, Creation and Contemporary Physics* (Minneapolis: Fortress Press, 1996), 113.
- ³⁴ P. Hefner, "The Evolution of the Created Co-Creator", in *Cosmos as Creation*, ed. Ted Peters (Nashville: Abingdon Press, 1989), 227.
- ³⁵ Quoted in R. Stannard, *Science and Wonders* (London: Faber and Faber, 1996), 16.
- ³⁶ K. Ward, *God, Chance and Necessity* (Oxford: One World, 1996), 79.
- ³⁷ Quoted in Mark Worthing, *God, Creation and Contemporary Physics*, 116.
- ³⁸ Paul Davies, "The Birth of the Cosmos", in *God, Cosmos, Nature and Creativity*, ed. Jill Gready (Edinburgh: Scottish Academic, 1995), 19-20.

- ³⁹ A. Einstein, "On the 'Cosmological Problem'", Appendix in *The Meaning of Relativity* (London: Methuen, 1950), 123.
- ⁴⁰ E.P. Tryon, "Is the Universe a Vacuum Fluctuation", *Nature*, 246 (1973): 396-397.
- ⁴¹ A. Vilenkin, "Creation of Universe from Nothing", *Physical Letters B*, 117:25; *Physical Review D*, 27:12 (1983): 2848.
- ⁴² J. Hartle and S. Hawking, "Wave Function of the Universe", *Physical Review D*, 28 (1983): 2960-2975.
- ⁴³ S. Hawking, *A Brief History of Time* (London: Bantam, 1988), 136.
- ⁴⁴ Ibid., 141.
- ⁴⁵ D.N. Page, "Hawking's Timely Story", *Nature*, 332 (1988): 742-743.
- ⁴⁶ J. Polkinghorne, "The Mind of God", *The Cambridge Review*, vol. 113, no. 2316 (1992): 4.
- ⁴⁷ J.D. Barrow and R. Matzner, "The Homogeneity and Isotropy of the Universe", *Monthly Notices of the Royal Astronomical Society*, 181 (1977): 719-28.
- ⁴⁸ A. Linde, "The Inflationary Universe", *Physics Today*, vol. 40, no. 9 (1987): 61.
- ⁴⁹ C. Isham, "Quantum Theories of the Creation of the Universe", *Quantum Cosmology and the Laws of Nature*, R.J. Russell et al. (eds), (Vatican City State: Vatican Observatory, 1993), 77-78.
- ⁵⁰ Quoted in Max Jammer, *Einstein and Religion* (Princeton: Princeton University Press, 1999), 251.
- ⁵¹ J.M. Zycinski, "Metaphysics and Epistemology in Stephen Hawking's Theory of the Creation of the Universe", *Zygon*, vol. 31, no. 2 (1996): 271.
- ⁵² S. Hawking and G. Ellis, *The Large Scale Structure of Space-Time* (Cambridge: Cambridge University Press, 1973), 364.
- ⁵³ C. Isham, "Creation of the Universe as a Quantum Process", *Physics, Philosophy and Theology*, 398.
- ⁵⁴ M. Mutahhari, *Sharh-e Mabsout-e Manzoumah*, vol. 4 (Tehran: Intesharat-e Hekmat, 1369 H.), 109.
- ⁵⁵ P. Hodgson, *Science and Creation* (Oxford: The Farmington Institute for Christian Studies, 1995), 1-3.
- ⁵⁶ C. Isham, *Quantum Cosmology and the Laws of Nature*, 54-55.
- ⁵⁷ E. Regis, *Who Got Einstein's Office?* (London: Simon and Schuster, 1988), 210-211.
- ⁵⁸ Quoted in S. Jaki, *The Relevance of Physics* (Edinburg: Scottish Academic, 1970), 449-450.
- ⁵⁹ Ian G. Barbour, "Creation and Cosmology", *Cosmos and Creation*, ed. Ted Peters, 122.
- ⁶⁰ R.J. Russell, "Cosmology from Alpha to Omega", *Zygon*, vol. 29, no. 4 (1994): 563.

God, Life, and the Cosmos

Christian and Islamic Perspectives

Edited, by

TED PETERS

MUZAFFAR IQBAL

SYED NOMANUL HAQ



Routledge

Taylor & Francis Group

LONDON AND NEW YORK

First published 2002 by Ashgate Publishing

Published 2016 by Routledge

2 Park Square, Milton Park, Abingdon, Oxon OX14 4RN

711 Third Avenue, New York, NY 10017, USA

Routledge is an imprint of the Taylor & Francis Group, an informa business

Copyright © Center for Theology and the Natural Sciences 2002

The editors have asserted their moral right under the Copyright, Designs and Patents Act, 1988, to be identified as the authors of this work.

All rights reserved. No part of this book may be reprinted or reproduced or utilised in any form or by any electronic, mechanical, or other means, now known or hereafter invented, including photocopying and recording, or in any information storage or retrieval system, without permission in writing from the publishers.

Notice:

Product or corporate names may be trademarks or registered trademarks, and are used only for identification and explanation without intent to infringe.

British Library Cataloguing in Publication Data

God, life, and the cosmos.

1. Islam and science. 2. Religion and science. 3. Life - Origin
- Religious aspects - Islam. 4. Life - Origin - Religious
aspects - Christianity.

I. Peters, Ted, 1941- . II. Iqbal, Muzaffar. III. Haq, Syed
Nomanul.

291.1'75

Library of Congress Cataloging-in-Publication Data

God, life, and the cosmos: Christian and Islamic perspectives / [edited by] Ted Peters,
Muzaffar Iqbal, Syed Nomanul Haq.

p. cm.

Includes index.

ISBN 978-0-7546-0883-7

1. Religion and science. 2. Islam and science. I. Peters, Ted, 1941- .
II. Iqbal, Muzaffar. III. Haq, Syed Nomanul.

BL240.3.G63 2002

291.1'75-dc21

2002022547

ISBN 13: 978-0-7546-0883-7 (hbk)