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THE PLACE OF GOD IN MODERN COSMOLOGY

Father Alexander Shimbalev

Some recent Christian thinkers have made attempts to harmonize Christianity and science by trying to show a positive correlation between current cosmology and a literal reading of the account of creation in Genesis. This essay argues that this approach is mistaken since it misunderstands the practices of science and hermeneutics. Instead it is argued that Scripture and tradition make only very broad claims about the nature of creation which must be respected when thinking about the universe. Those broad claims are described here.

There appeared, in the first half of the twentieth century, a desire to realize a 'major aim' in science, to separate science from other forms of cognition — myth, religion, and philosophy. It was supposed that each of the previously mentioned forms of cognition would explain all phenomena and natural processes only by means of cognition specific for each of them. So, for example, science should not attempt to explain natural phenomena using the witness of religion or philosophy.

How far this aim can be achieved in practice is a debated and very complex issue. A scientist is still a human, and he/she is influenced by his/her worldview, meaning that he/she has certain knowledge of philosophy, religion and mythology. It is never possible to define what exactly made a cognizing explorer find a right answer: was it the study of scientific evidence or an allegory from the symbolic text?

However that may be, modern science tries to solve the problem of the origin and evolution of the Universe by its own methods. A scientist attempts to comprehend the world using empirical evidence and the theoretically interpreted descriptions of the observed regularities.

A Christian also can half-open a curtain of the mystery of Creation and the origin of the Universe. Holy Scripture contains this information. The biblical text does not look like a scientific text; it is often allegorical; it has the many-level structure and does not yield its message to every inquirer. Holy Scripture is the most important source of truth for a Christian. The basic facts of creation are written in the first chapters of the book of *Genesis*, although there are other hints and statements concerning the origin of the Universe in other books of Bible.

How could Moses, the author of the book of *Genesis*, find out the details of the Universal Creation? God himself witnessed to Aaron and Miriam: "Listen to my words: if there be a prophet of the Lord among you, I will



make myself known unto him in a vision, and will speak unto him in a dream. Not so with my servant Moses, who is faithful in all mine house. With him will I speak face to face, and not in dark speeches; and the similitude of the Lord shall he behold." (Numbers 12:6-8)

Moses, who got knowledge about the beginning of our world from the Lord, set it forth in the language of his epoch — instructively and even allegorically. In order to penetrate into divine mysteries and to correctly comprehend Holy Scripture, a human needs to be honored with a special grace from God. The apostle Paul says about Christian cognition the following: "My speech and my preaching was not with enticing words of man's wisdom, but in demonstration of the Spirit and of power: that your faith should not stand in the wisdom of men, but in the power of God." (1 Corinthians 2: 4-5)

If we try to confirm the modern scientific paradigm with the Holy Scripture and consider this as imperishable truth we would fall into an error of our ancestors, who made the Ptolemy-Aristotle model of the world sacral. We should realize that science develops, and one paradigm replaces another. Holy Scripture is invariable. Possibly, scientific discoveries will make theologians understand the sense of the biblical texts better and deeper, and the Bible will open new ways in science. But, there is a trap even in this idea. In what measure does our current experimental knowledge correspond to the Superior Truth, which is concealed in the Bible?

The Bible cannot serve to illustrate scientific theories, because changes in the latter will lead to new interpretations of the scriptural texts every time. We should remember the words of Galileo's contemporary, Cardinal Barony, that the Bible teaches us how to go to heaven and not how the heavens go.

The many apologetic and critical works by the modern scientists, unfortunately, are getting out of date faster than they find readers.

We may highlight the basic ideas, which rest in the biblical understanding of Creation and compare them with the current experimental knowledge. We should notice, however, that cosmology has a whole set of hypotheses purporting to explain the origin of the Universe and its evolution. These theories are often contradictory, and, very often, are not supported by any evidence.

Along with the hypotheses based on evidence, there are the invented hypotheses based on faith. They are interesting, as is any phenomenon of human intellect, as philosophical reflection, but cannot serve as a part of scientific explanation of the Universe. The problem of faith in science was very important in the past and still important nowadays. For example, everybody knows that the atomic theory of Democritus could not be called scientific either in the ancient world or in the modern. Democritus considered that atoms are indivisible particles of variable shapes with the hooks that couple the atoms with each other. This idea does not correspond to reality. The atomism of the Renaissance epoch was also no part of empirical science, because it was based not on the evidence but on mere reflection.

In the beginning of the 20th century the Bohr model of the atom appeared. This model was very close to the ancient understanding of atomism. But the development of quantum mechanics showed that there

are no indivisible particle-corpuscles.

Nowadays, many scientists base their ideas on faith. For example, many of them believe that life arose by natural processes, although there is no convincing scenario of how such a process would work. Some of them believe that there is intelligent life on other planets although there is no evidence of that. This faith differs fundamentally from religious faith based on Holy Scripture and spiritual experience in prayer.

Let us highlight basic ideas of the biblical understanding of creation.

1. Creation 'from nothing' is a dogma of our faith. The tradition based on the Bible, has an absolute understanding of all creation. The book of *Genesis* tells us about creation: "In the beginning God created the heaven and the earth" (Genesis 1:1). In the second book of *Macabees* we meet the same idea: "Look upon the heaven and the earth, and all that is therein, and consider that God made them of things that were not." (2 *Macabees* 7:28)

According to the ancient Jewish ideas of creation, the name of Deity is unspoken, and it may be called only 'the Infinite.' In order to let finite being to exist, the infinite God has to confine Himself. The self-restraint does not change the ineffable being but lets him manifest Himself. The initial foundation or condition of that 'other' is an empty place; at the beginning, it is only a point that is formed inside the absolute being by reason of his self-restraint or 'compression.' Because of that emptiness, the infinite light starts radiating or emanating.

The initial rays of this light are the fundamental forms and categories of being, or 32 'ways of wisdom.' They were identified with 10 numbers and 22 letters of Hebrew alphabet. Just as 10 numbers are enough to calculate everything and 22 letters are enough to write all possible books, so the unspoken Deity opens all his infinity through 32 ways. They are fundamental forms of all being. Conditioned by these forms the concrete Universe represents various degrees of recession of the divine light from its source.

In the Christian understanding of creation, matter itself is created. Matter is not eternal, as many ancient philosophical and religious systems consider; it is created 'from nothing.' The created order is a product of Divine will and, consequently, it is not coeternal with Him. That is because the nonbeing evoked into being cannot have the same eternity with the infinite God. The creator is not bound to preserve eternal matter, creating universe after universe. The Lord created the world freely and with love. In creation we see order, purposefulness, and love. The Divine being itself is reflected in all creation and calls others to participate in His Deity. This symbiosis of the Creator and the creature is the sense and justification of creation.

According to modern cosmology, the Universe came into being from a singularity, a condition when volume tends to zero and density tends to infinity. Fundamentally, a singularity is a breach of time and a special condition of space. Modern science cannot say anything about matter in the singularity state. The known forms of matter — substance and radiation — are absent there. None of the physical theories can describe this condition because of absence of any analytical and mathematical apparatus. Also, there is an epistemological problem posed by 'the limits' of conceivability.

Science, moving away from religion, states that matter exists eternally. There are several hypotheses purporting to explain what existed before the

singularity and how the Universe will develop further.

The hypothesis of John Wheeler and others states that the existence over time of the Universe consists in a cyclical process of Big Bangs and collapses. Coming back to a singularity every time, the Universe does not remember its past state and may be 'born' again with a totally new set of constants.¹

Another hypothesis considers the eternal vacuum as one of the states of matter having certain potentials allowing the production of real particles. Modern science defines a vacuum as a medium filled with virtual particles. The fluctuation of the vacuum can generate real particles. Quantum Theory permits short-duration failure of the energy conservation law, and so the system may borrow energy, if it can return the energy back quickly. So, according to the authors of this hypothesis, some fluctuations could cause the beginning of the Big Bang.²

At first glance, these hypotheses contradict the idea of creation and do not require a divine origin. However, on closer examination these hypotheses appear to be rather problematic, and they do not answer the questions unambiguously. As for the first hypothesis, there is no evidence of infinite fluctuations of the Universe, and this idea exists as a fantasy. The second one supposes the existence of the quantum field and the laws of quantum physics as eternal absolute conditions, which is also improbable.

Even the idea of many Universes is not foreign to the Christian tradition. The theory most widely acknowledged in modern cosmology, that developed by Andrei Linde and others, suggests that the Universe consists of many isolated worlds — domains. These regions arose like a bunch of grapes from the Big Bang. Every mini-universe may have its unique conditions, which would be unknown and incomprehensible to neighbouring universes.³ St. Theophan the Recluse (1815-1894) wrote about the creation of the Universe: "The world is sketched out by the Word of God in time and space. The Word became being; the Word became being. Every word from the mouth of God gave a birth to worlds, whose number we are not even able to calculate."⁴ As we may see, the Russian saint, who became a recluse in 1872, grasped great spiritual truths.

2. The creation constituted the beginning of time. The apostle Paul speaks of God the Father who 'also made the worlds' through Jesus Christ (Hebrews 1: 2). St. Basil the Great writes: "The world is created by the divine will not in time; it is said: He *created it at the beginning*. The ancient interpreters explained this more clearly: in short, God simply created, i.e., suddenly and instantly."⁵ What was before the moment of creation — is absolutely unknown. In the Hebrew text of The Bible the first letter is b-'bet'—having the shape of a cramp, which, symbolically, isolates the moment of Creation from outside, and forbids any attempts to contemplate this topic. It is impossible to imagine what was 'before' the creation: God exists out of time; in God 'beginning' has no sense. The beginning arises with created being. The act of creation establishes time whose categories are 'before' and 'after.'

3. The created world is perfect and harmonious. Moses, wishing to show that the world is a work of art, contemplation of which allows us to recognize the wisdom of its Creator, uses the word 'created' purposely. Basil the Great writes that "God was not for the world merely the cause of its exis-

tence, but being good he created it a useful world, being wise he created it as a very beautiful world, and being powerful he created it as a very great world."⁶ The biblical days of creation witness that the Lord acts like an artist who proceeds to the essence of the universe and puts its parts into agreement its parts into agreement with each other so as to make the whole coherent and harmonious.

The diversity and complexity of the physical systems which constitute the observable Universe are so striking that the purpose of discovering the simple laws, which would explain all these systems, seems hopeless. Nevertheless, study of the Universe has shown that if the fundamental constants were different, the world would be also different. Such important building blocks as the stars, for example the Sun, have characteristics that are caused by improbable coincidences of numbers which are based on the fundamental constants corresponding to the different areas of physics.

The initial parameters of the early Universe were adjusted with the remarkable accuracy. If they varied just a little, the Universe would not be the one we observe now. Matter would be structured in a totally different way. In 1930, A. Eddington and P. Dirac were astonished by the curious and unexpected coincidence of certain very big numbers arising from calculations of atomic physics and cosmology. They formed the impression that the Universe was balanced out in certain ways.

St. Theophan the Recluse writes about the divine arrangement of the world: "But as to how from the all possible forms of the world being did He vouchsafe to choose the one we see now: believe and hold that this is the best form of being that a finite created thing which has its being in the time, can have."⁷

4. The aim of the creation of the world and man is revealed to us in the fellowship of the mystery, "which from the beginning of the world hath been hid in God, who created all things by Jesus Christ: with the intent that now unto the principalities and powers in heavenly places might be known by the church the manifold wisdom of God, according to the eternal purpose which he purposed in Jesus Christ our Lord." (Ephesians 3:9-11) Reflecting on the creation of man in the image and likeness of God, the Fall, and the incarnation of Jesus Christ the Son of God, we touch on a great mystery and penetrate God's plan, manifested in the interweaving of times.

According to St. Maximus the Confessor, God descends into the universe, becomes man, and man ascends to the fullness of God and becomes God, because this union of the two natures, divine and human, was predetermined in the Eternal Divine Council. The world was created for the sake of this ultimate goal.

The entire world was getting ready for the incarnation of the Son of God — Jesus Christ. For this reason the world is Christ-centric and anthropocentric, because Jesus Christ became incarnate in a human body. This incarnation allowed Jesus Christ to unite in Himself the different spheres of the cosmos in Jesus Christ in order to lead them into union with God by administering a sacrament of deification. This goal presented to the first man, Adam, was not accomplished by him, but was accomplished by Jesus Christ.

The whole world was getting ready for this great event. Here we may make a parallel between the development of the universe and the action of

the Holy Spirit in humankind in order to prepare for the divine incarnation. Thus, the reason of creation is found not in the past but in the future. God indeed is not subservient to time.

John the Evangelist witnesses to the eternity of Jesus Christ: "All things were made by him; and without him was not any thing made that was made. In him was life; and the life was the light of men." (John 1:3-4) The Christmas *kontakion* of the Orthodox Church reminds us that "the Virgin gives birth to the one who is above everything created." Man participates in Christ and communicates with the great unity of God, the Universe, and the Church through reception of the Body and Blood of the Savior. Thereby the secret of the cosmological anthropic principle is revealed.

5. Christians believe in the continuous participation of God in the life of the world. The Lord constantly interferes in the life of Universe, a fact reflected in the conception of continuous creation. The dreams of Laplace about prediction of the future, based on knowledge of all the coordinates of all particles in the present, cannot come true not only because of perturbations of the natural forces but also because of God's interference in the affairs of the universe. The psalmist, David, is witness to us about the continuous presence of God in the world: "These wait all upon thee, that thou mayest give them meat in due season. When thou givest it them they gather it, and when thou openest thine hand they are filled with good. When thou hidest thy face they are troubled; when thou takest away their breath they die, and are turned to dust. When thou lettest thy breath go forth they shall be made, and thou shalt renew the face of the earth." (Psalm 104, 27-30)

Therefore the present hides much that is unexpected for us, and we are not able to know anything of the end of the world: "But of that day and hour knoweth no man, no, not the angels of heaven, but my Father only." (Mathew 24:36)

As we see from the history of cosmological thought, the scientific scenarios of the origin and evolution of the Universe constantly change, sometimes flowing smoothly from one into another, sometimes fundamentally overturning the previous scenario. There is neither sense or need constantly to coordinate them to the Hexaemeron (the Six Days of Creation). However, the truths discovered by scientists who attempt to understand the structure of the Universe are close to the biblical worldview. As I. Barbour notes: "Under thorough analysis of modern cosmology it is impossible to find in it any grounds for a model of conflict."⁸

In spite of our attempts to separate religion from science, all the same they reach out for each other, constantly finding something in common. This tendency produces a longing for completeness and the ancient vision of synthesis.

The presence of divine design together with continuous creation were noticed by modern scientists in the astonishing co-ordination of the structure of the Universe and its balanced development. These facts, in particular, bear witness to us of God.

NOTES

1. Wheeler, John A. "The Universe as Home for Man," *American Scientist*, 62 (1974): 683-691.
2. Atkins, Peter. *Creation Revisited*. Oxford and New York: W.H. Freeman, 1992.
3. Linde, Andre. *Particle Physics and Inflation Cosmology*. London: Taylor & Francis, 1990.
4. St. Theophan the Recluse. *Answers by St. Theophan the Recluse to questions on the spiritual life*. Saint Herman of Alaska Press, 2000, page 54.
5. Basil the Great. Remarks on the Six days of Creation. *Part 1* [http://www.ccel.org/fathers2/NPNF2-08/Npnf2-08-09.htm#P1986_546370]
6. *Ibid.*
7. St. Theophan the Recluse. *Answers by St. Theophan the Recluse to questions on the spiritual life*. Saint Herman of Alaska Press, 2000, page 114.
8. Barbour, I. *Religion and Science: History and the Present*. Moscow: BBI, 2001, page 256.