

THE UNIVERSE, TIME, ETERNITY AND INFINITY

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The conceptions of «universe», «eternity», «time» and «infinity» belong to the list of the most fundamental and complex characteristics of the matter. The concepts of "universe", "eternity", "time" and "infinity" is defined in article in fundamentally new interpretation. This was made possible thanks to the identification by the author the nature of time, and formulation and theoretically and experimentally justification of the Law of the Universe functioning.

Keywords: time, eternity, Universe, infinity, Law of the Universe functioning.

ВСЕЛЕННАЯ, ВРЕМЯ, ВЕЧНОСТЬ, И БЕСКОНЕЧНОСТЬ

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В статье Понятиям «Вселенная», «вечность», «время» и «бесконечность» дается в статье принципиально новое толкование, в корне отличающееся от традиционного. Сказанное стало возможным, прежде всего благодаря выявлению автором природы времени, а также сформулированному и теоретически и экспериментально обоснованному им Закону функционирования Вселенной как целое.

В работе доказывается, что вечность, вопреки современным представлениям о соотношении вечности и времени, не является бесконечным временем на том основании, что время всегда конечно, поскольку образуется в результате последовательной смены качественно новых состояний конкретных, конечных объектов, процессов. Рассмотрение вечности как безначального и бесконечного течения времени означает не что иное, как признание объективности некоторого единого вселенского времени, отсутствие которого доказано.

Однако, несмотря на то, что между временем и вечностью существует бесконечное различие, вечность и время представляют собой единство – единство противоположностей: сохранения и изменения, стабильности и нестабильности, и это единство данных противоречивых сторон материи выражено в ее движении.

Согласно Закону функционирования Вселенной, имеет место последовательное полное исчерпания возможностей, заложенных в ее материальной основе Вселенной. Следовательно, во Вселенной происходит постоянная последовательная смена циклов полного исчерпания возможностей, заложенных в ее материальной основе.

В этой связи понятие бесконечности, применительно к глобальной Вселенной, по мнению автора, следует рассматривать как бесконечное повторение конечного.

Ключевые слова: время, вечность, Вселенная, бесконечность, Закон функционирования Вселенной.

The conceptions of «universe», «eternity», «time» and «infinity» belong to the list of the most fundamental and complex characteristics of the matter. It is no accident that at the dawn of the human civilization those categories were the object of the keen interest and rapt attention. It is known that in the European culture a clear-cut distinction between two images of time (represented by the terms «eternity» and «time») was first introduced by Plato, though at the same time he referred to «the ancient and sacred philosophers» as his forerunners [Borkhes, 1994: p. 163]. Since those ancient times, many outstanding thinkers and philosophical schools offered their original interpretation of these concepts. In the modern philosophical literature and reference books we have the long established view that the eternity is endless time, that is the time, which has neither beginning, nor end. However, considering the problem of correlation between eternity and time in terms of the functional time conception, which adequately reflects objectively real time (the conception has been developed by me) [Lolaev, 1989; Lolaev, 1992; Lolaev, 1993a; Lolaev, 1993b; Lolaev, 1994; Lolaev, 1995; Lolaev, 1998a; Lolaev, 1999; Lolaev, 2003; Lolaev, 2012], we can see that endlessness still has its end.

Thus, according to the functional concept of time, the actual time period is formed by the sequential change of qualitatively new states of concrete, finite material objects, processes. Objectively real, functional time is formed by all processes (without exception) in the nature, starting from the elementary particles and ending by the cycles of expansion and contraction of the Universe (if the Universe pulsates and «Hot Universe» theory adequately reflects reality existing in the nature).

In our opinion, we have to prove not only theoretically, but also on the experimental basis the existence of the objectively real, functional time, as well as to formulate precise scientific definition of the concept of «time».

In contrast to the previously known conceptual, postulated times, which were invented by the human beings, the functional time concept adequately reflects the objectively real time, which arises and exists in the physical reality, in nature. The matter is that the functional concept deals with objectively real time – the time of nature itself.

Difference between those times is that the functional time arises in the human consciousness as the reflection of the objectively real time, which arises and exists in the physical reality and not in the consciousness. Thus, in nature the objectively real time corresponds to the time of the functional conception in the physical reality.

Thus, according to the functional concept of time, the actual time period is formed by the sequential change of qualitatively new states of concrete, finite material objects, processes (each object is a process). The process and time are inextricably linked. They arise, exist and finish together. As there are manifold interpretations of the concept of the process, it should be emphasized that this we are talking about the consistent qualitatively new changes of a particular object or phenomenon as a whole, which are expressed in certain objective laws. However, it should be noted that the process has substantial content and in this regard is the primary concept, and time is unsubstantial (it is neither a substance nor a field) as there is no particular time substance. So, it is derivative and secondary notion (function). In this regard, the substantial material processes cannot exist in the unsubstantial time if they do not form it themselves.

From the above mentioned it also follows that the objective and real functional time is formed by the movement as a qualitative change, the movement as a cause of formation. This refers to the formation as the substantial change associated with the introduction of a qualitatively new, with the appearance and disappearance of objects and their conditions and their transformation into another objects, states and condi-

tions, in which something (previously non-existent) starts to exist. When the material content of one object is embodied in other subsequent objects, they begin to form their own times. Unsubstantial time cannot move from one object to another. Each object forms its own time. The characteristics (features) of the latter depend on the nature of the development of the object, which forms the time.

Objectively real, functional time is formed by all processes (without exception) in the nature, starting from the elementary particles and ending by the cycles of expansion and contraction of the Universe. If the latter pulsates, both cycles (expansion and contraction) of the Universe also would have to emerge and finish, as in any objects' processes. Thus, each object process, as already mentioned, forms its own time, in which it exists [Lolaev, 1998b].

At each object, as a result of realization of the potential possibilities in it and its interaction with the environment, there are a lot of micro- and macro-changes. However, the time of the object is not the sum of the times formed in it at different structural levels of matter. Time of the object as a whole is formed by the successive qualitatively new conditions, which are the result of complex qualitatively new changes taking place in the object. External manifestation of such changes (as an example related to a person) is the childhood, youth, adolescence, etc.

Objectively real time we call as «functional» due to the fact that, as the existence of time itself and all of its properties depend on the changes that occur in the specific material objects as a result of realization potential possibilities in it and its interaction with the environment.

Because of its insubstantiality, time should arise with specific material objects and processes, because functional time is formed by real physical objects, since their emergence and disappearance as such (in connection with the embodiment of their material content in other subsequent objects). New one, exactly sequences, material objects, processes, because of insubstantiality of time, form their own times, in which both exist. Successive state of material objects and the objects themselves, and cycle through the duration of time formed by them. Moreover, the material content of the sequence of successive objects, as it is substantially embodied in the following objects, whereas they form unsubstantial time durations, cannot move from object to object. Another thing that every other object (as long as there is any) forms its own, objectively existing functional time.

Here it is necessary to refer to the following fact: the attempt of P. Dirac, V. A. Fock and B. Podolsky to offer multi-time theory (particles were compared according to their times) failed. The attempt was doomed to failure, since the P. Dirac and V. A. Fock and B. Podolsky, each particle can match only postulated, invented by human time, not objectively real functional time formed by the particles themselves as a result of their consistent change of qualitatively new states. However, this failed attempt of well-known scientists to create multi-time theory for elementary particles other specialists mistakenly interpreted as «proof» of meaningless to claim that each object forms its own time.

Existence of the objective, real, functional time, independent of the human's consciousness can be illustrated by a simple experiment. Thus, when a man is watching a drop of ink drops in a glass of clean water and the process of its dissolution over the entire volume of water in its consciousness arising time relationships. However, the person is not aware of the fact that the process of distribution of ink droplets throughout the water forms its own, objectively real functional time, in which it ex-

ists. In the first case there is a subjective time, which exists only in the consciousness of a person, and the second one is the objectively real, functional time, which exists in the physical reality. Therefore, the proper functional time is formed by setting the real experiment and exist independently from human beings and their consciousness until the process takes place. In this connection, the time duration is formed irrespectively to the observer's presence or absence.

Thus, the concrete material process is provided with the time relations by nature itself. The mechanical movement is provided by subjects.

For example, in the formulation of this experiment (even if we o watch the process of the ink droplets dissemination throughout the water) the time duration is generated until the process proceeds as such.

The fact that each object forms its own objective and functional time, in my opinion, is reflected by the following example. It is known that all medications have the exact shelf life (2, 3, 4 ... years), so it confirms the fact that each object forms its own time, otherwise it would not be necessary to determine the expiry date. When the shelf life of a medication expires, it is no longer the remedy to treat an ill person. In other words, a medication exists during the period until its expiry date. If we still keep the pills after the expiry date they cease to be a medicine and begin to form their own time, as some other tangible objects, which have no relation to medications. Moreover, even if we do not make any external influence on a pill, the latter will scatter some day and its every particle will form its own present time.

Similar transformations occur with all, without exception, specific objects in nature. When they cease to function as such, the following objects, which are embodied in their material content, are also beginning to form their own real times.

The above mentioned confirms the fact that all the material objects, which constitute the world, the Universe as a whole, exist their own real times. As there is no single universal or absolute time, which would exist independently to the material objects, we can state that every material object exists only in its own time.

As it has already been mentioned, the unsubstantial functional time should occur together with the material objects in order to exist. The world as a whole does not arise and disappear as such because of its non-creatable and non-destructible nature. So, the concept of «time» cannot be applied to it. No single world time exists. And it is caused not by a finite and limited velocity of the material interactions, since the feature of the unsubstantial time does not depend on the speed of the material process, which forms the time.

From our point of view, the concept of sequence cannot be applied to the matter as a whole, that is to the global Universe. Even if the Universe as a whole pulsates, – only periods of expansion and contraction form their own time and exist in it, but not the indestructible and uncreatable Universe. Only the Universe cycles of oscillating can form times, which have the stating points since the "Big Bang" and the beginning of the compression, and not the Universe itself.

Since time is formed by the specific, finite material objects it is always finite. Therefore, eternity is not the infinite time, despite the fact that in the philosophical literature and reference books the eternity is an infinite lifetime of the material world or the passage of time, without the beginning and end [*Lolaev, 2002*].

Eternity of the world is the eternity of the matter (the unchangeable feature of the matter as the substantial reality). The matter is tenure and unchangeable with diversity and turnover of its manifestations. The eternity is associated with the substance, while the time is associated with the substantial sphere that is the changeable aspect of the matter. Movement and changes constitute the cause of the time forma-

tion. On the other hand, movement and changes cause immutability, persistence and stability of the matter as the only substantial reality.

Therefore, the conception of «eternity» is applicable to the matter as such, which is the phenomenon, which remains constant and unchanging. And the conception of «time» is applicable only to the phenomenon, which appears and vanishes away, and has the transitory nature. Although there is an infinite difference between time and eternity, the time and eternity still make a unity, which is the unity of contrasts: constancy and changeability, stability and instability. And the unity of these contradictory aspects of matter is displayed in its motion. Taking into consideration the above mentioned, we cannot agree with J. Askin who considered eternity as endless: «Concerning the eternity as the time duration, which has neither beginning nor end, thereby we define past and future as eternity. Towards the past eternity appears as the absence of the start point of the existence of the world. Towards the future it acts as the lack of the end of the world, its doomsday. But the conception of the eternity is impossible to settle by these two aspects. There is one more kind of time, which is the central one moreover. It is present. And eternity mainly appears in the fact, that there is always a real being of the material world and actual existence» [Askin, 1966: p. 185–186]. However, if we mean that, first, the Universe as a whole does not form a single time, it would be incorrect to talk about types of time as applied to the non-existing time. Second, consideration of eternity as the absence of the beginning and end, that is endless flow of time, means nothing else than the recognition of the objectivity of some single universal time, the lack of which has been already proved. Third, as it was mentioned, there is not and cannot be any time both beginningless and endless in real actuality since the functional, objectively real time is formed by specific, finite, material things, phenomena and processes, therefore only they can exist in time. Fourth, all without exception concrete material objects and their successively changing states form only intervals, periods of present time, which have a physical meaning, physical value. Past and future do not have the status of reality, they cannot really have it. Fifth, due to the above reasons, the global Universe has always been, is now and will always be the Universe, as it is uncreatable and indestructible, but not because it exists in time having neither beginning nor end. So, attempts to identify the eternity and infinity on one hand, and time on the other hand, are wrongful.

Consequently, the functional time, flows from the present, which is formed by the states of the object and the object itself as such, to the present, which is formed by the successive states of the same object and those objects, into which the material object's content is embodied. So, it does not flow from the past through the present to the future, as it is commonly believed in science [Lolaev, 1996].

As it is known, after the launch of the Large Hadron Collider scientists hope that there would appear the "wormhole" that is a hole into some other time. The result would be supposedly the ability to travel in time. However, since the physical reality of each object forms its own present time, in which it exists, the possibility to travel through different times is excluded. For this reason, it is not possible to create the time machine [Lolaev, 2010].

The conception of infinity and time is inapplicable to the matter as such, as well as to the global Universe, whether the finiteness of the world is a necessary consequence of the cosmological solution of the relativity equations or not.

The existence of the Universe in infinite time is not resulted from causality (neither causality itself, nor together with conservation laws), despite the fact, that it really is a connecting link, which unites the various successive states of the development of matter, and genetic relations between one phenomenon resulting in the other, which has a significant temporal character. The point is that these are not the states of matter as such that get successively alternated, but specific, finite material objects and the objects themselves, which can only form their own time, but for the whole universal time. It should also be noticed, that the impossibility of a closed circling of time supposed in the cosmological model of «oscillating Universe», is being wrongfully grounded with the fact that «all circulations in the world are relative and include only partial repetition of the previous states: their endless sequence under the constant evolution of matter displays the eternity of its existence in time» [FES, 1983: p. 80]. The fact is that, firstly, under the reasons mentioned above, the global Universe does not form its own time, about closed circulation of which we could talk. Secondly, in view of the unsubstantial nature of time, its closed circulation is impossible, no matter whether all circulations in the world are relative or absolute. So, time duration, formed by the sequence of alternating cycles of the Universe expansion and compression, cannot be closed, because the cycles each form its own time, which, cannot pass to the next cycle or get back to itself resulting from its insubstantiality. And this is despite the fact that these cycles must be repeated absolutely since each period of the Universe expansion and compression starts probably after its getting definitely, maximum of possible dense or sparse.

And more, the Universe as a whole can pulse only being subjected to the absolute repetition of the sequence of the periods of its expansion and compression, since only then the states of the highest possible density and sparseness of the Universe, which are the start of the cycles of its expansion and compression, would be equal. Otherwise, one of the mentioned states of the Universe should have taken place first, but as we know, the birth of the Universe as a whole is excluded by all the data of science and practice.

The fact is that the information available in the modern science and practice, in my view, allows speaking about the causes of self-organization of matter.

Here we have in mind the Law of the Universe functioning, which was stated and substantiated by me, i.e. the law of consecutive complete exhaustion of possibilities contained in the material basis of the Universe (meaning the Universe that includes the whole objectively existing world).

According to this law, when all possible changes contained in the material basis of the Universe come to an end, because the Universe is uncreated and indestructible, there necessarily starts a new, subsequent cycle. This means that absolutely complete, successive repetition of periods of qualitative changes occurs in the Universe, resulting in the emergence and disappearance of concrete forms of matter. In other words, in the Universe, regardless of whether it is pulsating or not, there is an eternal and endless repetition of the finite.

Thus, if the Universe as a whole is pulsating, then the Big Bang should happen every time when the Universe reaches the maximum possible strictly defined degree of density. Both the next cycle of expansion of the pulsing Universe and its subsequent cycle of compression must repeat identically, since the total energy in the Universe is always the same. The Universe as a whole can also pulsate only on condition of absolutely repeated consistently successive cycles of expansion and contraction, since only under this condition all the states of the Universe would be equal. Otherwise, the Universe would have to be created. However, as we know, uncreatability and indestructibility of matter is proved by all the scientific data and practice.

It should be emphasized that there are theoretical and experimental data available, which provide strong evidence that the number of potentially possible changes and transformations of material objects making up the whole world is finite.

As is known, as early as in 1890, long before E. S. Fedorov determined the structure of crystals, all possible combinations of symmetry elements in space were derived on strictly mathematical basis. E. S. Fedorov and A. Schoenflies proved that there can only be 230 such spatial symmetry groups [Bokiy, 1971: p. 64].

We also know that this conclusion later became a firm foundation of modern crystal chemistry – the theory of the atomic structure of crystals. At present, over two dozen of thousands of crystal structures were identified, and there is no single structure among them that would contradict Fedorov's theory.

It follows from the abovesaid that matter does not have an infinite number of degrees of freedom of changes, and therefore cannot acquire an infinite variety of forms. In this regard, in the uncreated and indestructible Universe there must occur infinite repetitions of a finite number of changes and transformations of matter.

I would like to draw one more example as another confirmation of the fact that matter does not have an infinite number of degrees of freedom of changes, and therefore cannot obtain an infinite number of different kinds of shapes.

Each thing that makes up the Universe disappears, dissolves, ceases to exist due to its interaction with the environment before it exhausts all the potentially possible changes contained in its material content (in this connection we can rightfully speak not about sporadic, but about deliberate nature of the outcomes of material things interaction).

Thus, the material content of things making up the world, the Universe, and, therefore, the material basis of the Universe, as a whole, even with the account of the dark matter present in it, there is limited potential for change.

Let me also mention such evidence of truth that the matter cannot have an infinite number of free changes and transformations. We will speak about the fact that quantitative increase of elementary particles in atoms cannot last indefinitely, and it has a certain ceiling. And, although there may be much more atoms in molecules than elementary particles in atoms, the number of atoms cannot increase indefinitely in molecules either.

According to the Law of the Universe functioning, in the nature there may only be the order, the chaos, and the transition from the chaos to the order, or vice versa. In my view, the nature follows not only the path of order of its forms and processes, not only the path of development. It follows the path of consistent realization of any changes and transformations, resulting in the existence of both the processes of development and the processes of regression. In this regard, progress cannot be the single highest necessity.

I would like to emphasize that all the processes of self-organization of matter in nature, without any exception, are the result of the Law of the Universe functioning.



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