ФІЛОСОФІЯ ПРИРОДИ, СВІТУ І КОСМОСУ

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PROBLEMS OF COGNITION OF TIME AS AN ELEMENT OF THE EXTERNAL WORLD

This scientific article examines the topical issue of the essence of the time course in space and its perception by man. The paper emphasizes that material objects, socio-political relations, norms of law, ethical and aesthetic principles cannot be unchanged, they are necessarily subject to temporal influence. Time is the all-encompassing factor that makes it possible to make an essential connection between events and phenomena occurring in space, giving them a proper perception of their place in the system of interactions of various phenomena in space. It is emphasized that space and time in nature do not occur separately, they are indivisible. The content of various scientific concepts concerning the study of the course of time and its connection with the phenomena of the material world, including the temporal dimensions of the development of legally significant phenomena for society, is analyzed. Scientific approaches are divided, according to which space and time are divided into real, perceptual and conceptual. A study of the ontological vision of temporal processes, according to which matter as a philosophical category is perceived not through its individual specific properties, but through the general, comprehensive and abstract nature of its manifestations. The historical analysis of the genesis of human cognition of time, its awareness of the fact that time, like space, is an indispensable attribute of any manifestations of existence, is carried out in the work. The scientific vision of the time course is studied, which consists first of all with external changes of a material object or other phenomenon, which is connected with the determination of its space-time parameters. The main scientific models and ideas about time are considered: Newtonian substantial concept, according to which absolute space remains motionless and the same everywhere regardless of something external, and time also exists independently in the objective universe, is a certain substance; and Einstein's relativistic conception, which proved that order in time is determined by specific material processes. Based on greater pragmatism and ease of use, the scientific concept of absolute time is widely used in systems of applied sciences, including jurisprudence. Absolute time is used quite successfully as the simplest model of real temporal application, but it should be understood as conditional.

***Key words**: cognition of time, temporal course, space-time parameters.*

Introduction. The material is in constant motion, and this movement occurs in a certain space and time. Space and time are forms of existence (being) of matter. Space determines the extensibility (geometric dimensions) of material objects and determines their interaction, while time determines the duration of existence of these objects and the sequence of their change. In other words, the content of matter is specific objects, as a form of their existence, like all matter, time and space, which are characterized by such characteristics as objectivity, irreversibility (for time) and recognizability. For many millennia, humanity has been trying to achieve the passage of time, to create a holistic system of knowledge about time, its properties, structure, to create theories of knowledge.

Purpose and objectives. In our daily lives we constantly feel the time factor in any field of activity. This applies to both economic and social relations and the sphere of knowledge of the various pages that reflect us. Material objects, socio-political relations, norms of law, ethical and aesthetic principles cannot be unchanged, they necessarily indicate a temporary meaning. Time is the all-encompassing factor that allows to make a significant connection, sharing and appearing that opens in space, giving them the necessary conclusions about their places in the system of interaction of various manifestations of specific interactions in space. For this temporary question, consider consideration in relation to space, while interaction has always been the best element of the study of the world. Undoubtedly, time and time in nature do not occur separately, they are indivisible. We do not know of any phenomenon that does not deal with parts of space and parts of time. Compared with logical convenience, it is possible to imagine a separate space and a separate time, only as our mind in general is accustomed to act in solving a problem. In fact, space and time will be shared only in our imagination. It is obvious that in nature there is only matter, which we disassemble into two main coordinates: space and time [1, p. 419].

Research methods. In science, the subject of construction is various concepts of the revision of the tile magazine and its connection with the phenomena of the material world, including the temporal dimensions of the development of legally significant phenomena for society. For the most famous with them – real, perceptual and conceptual space and time are divided. Real space-time is postulated as objective forms of existence of matter, conditions of coexistence of objects. Perceptual space and time of expression of conditions of existence and change of our representations and other mental acts of the subject. Finally, conceptual space and time are abstract mathematical structures that can model real space-time relations [2, p. 24]. Therefore, the study of the ontological vision of temporal processes, for which the material as a philosophical category is perceived not because of its specific properties, but because of the general, comprehensive and abstract nature of its manifestations, are relevant. This will allow, both at the general theoretical level and in the practical plane, the realization that time has a continuous manifestation, which is created in the feeling and transition of a particular person to real material phenomena reflected in the internal duration, creating time of the outside world. Duration – an attribute by which we understand the existence of created things, as they are in reality. Time is not a state of affairs, but only a module of thinking used to explain duration [3, p. 278–279].

Results. People have long tried to understand the passage of time. Time, like space, is an essential attribute of any manifestation of being. After all, every knowledge of a process, material object or other phenomenon is associated with the definition of its spatio-temporal parameters. At the beginning of human history, the importance of spatio-temporal organization of society was, above all, to ensure the survival of the individual. It should be noted that at this stage of awareness of the natural essence of the universe, the emphasis was on the knowledge of space, and only then – time. In the mind of the observer at first there was a clear spatial representation of the phenomenon, while its temporal features to some extent remained uncertain. Therefore, since ancient times in the history of mankind, temporal issues were considered in relation to space, this interaction was an important element in the study of the world. Already in the compilation of ancient myths, the concept of time (along with the concept of space) was not just a coordinate of a phenomenon, but was depicted by powerful forces that control everything. Thus, in the ancient Indian Vedas (about VIII century BC) time (kala) was defined as the personified root cause of existence and a destructive phenomenon. In Hinduism and other dharmic religions, the cyclical nature of time is metaphorically depicted as a kalachakra ("wheel of time"). In the religious and philosophical current of Zoroastrianism – Zervanism, time (in the person of God Zervan) was defined as the basis of the foundations that give rise to all other things [4]. Proponents of Orphic teachings in ancient Greece believed that Chronos (the personification of time) created the egg of peace from Chaos and the Aether, gave birth to fire, air and water, and from these elements arose several generations of gods. A serious role in the development of knowledge of time belongs to medieval researchers. They proceeded from the fact that all the temporal stages of existence are due to a higher power (god), so any phenomenon evenly passes through the stages of creation, development and termination. Thus, the time and events that exist in it are irreversible and

directed to the future. Cognition can occur taking into account the sequence and unfolding of events, and temporal changes are conditioned and predictable [5, p. 14–15].

Throughout the historical progress of mankind, much research has been devoted to temporal issues and the influence of time on the motion of matter. The question of the temporal arrangement of matter at all times to pay attention to philosophers, or those who considered themselves so, from Confucius [6, p. 33] to Kim Chen Ir [7, p. 6–7] Problems of space-time organization of matter were studied not only within the framework of philosophical science, but also special: mathematics, physics, other exact sciences, because they are general in nature. In particular, the development of the concept of time and its awareness by man is an integral part of the methodology of historical sciences. Taking into account these scientific developments, special terms appeared that characterized the essence of the temporal properties of the object of observation: biological time, social time, psychological time, etc. In fact, the development of our ideas about the space-time motion of matter are successive stages in the development of human cognition. The cognitive approach is used in the study of the properties of time within physical science. The special science of relationships in time is called chronometry, the interaction of conceptual time with space is studied within chronogeometry.

Scientific research of temporal properties has historically taken place within the notions of time as an absolute, homogeneous phenomenon that has the same parameters at all points in space. Such provisions in science formed the basis of the so-called substantial concept of time, formulated in general by I. Newton in his work "Mathematical principles of natural philosophy". According to its paradigms, absolute space remains motionless and the same everywhere regardless of something external, and time also exists independently in the objective universe, it is a certain substance, pure length, the course and properties of which are determined by itself. The scientist believed that time, like space, can exist independently of objects and phenomena [8, p. 53]. Strictly speaking, if we evaluate the category of time in terms of its absoluteness, taking into account the uniformity and homogeneity of its flow regardless of the movement of system objects, we will inevitably come to the conclusion of unidirectionality and actual immobility of absolute space, which is not true.

In absolute time, science adopts a certain homogeneous quantity, the same for all points in space, which changes continuously from the past through the present to the future. This time is homogeneous, the same at all points in space and does not depend on the motion of matter. According to Newton, absolute time in itself and in its essence, without any relation to something external, flows evenly and is called duration. Absolute time is constant during its motion. The same state, the same duration correspond to the existence of all objects, regardless of the speed of their movement or rest. This theory rejects any connection between the passage of time and the human person, absolute time in its motion cannot be changed, regardless of external circumstances, time floats evenly despite differences in the state, position or motion of objects. These properties, inherent in absolute time, do not follow from anywhere, they are introduced by humans themselves and are axiomatic. This approach to the application of absolute time in science is quite common, first of all, given its rationality, some real processes are eventually studied in science with the help of these tools. However, we must note that it is still conditional and does not fully reproduce the very essence of such a phenomenon as time, as it considers it as a separate category that does not depend on the material world.

Within the so-called substantial approach to the study of time, the space in which these properties are studied is postulated as three-dimensional, while time is accepted in the classical absolute form as a one-dimensional, homogeneous, objective and continuous property of matter. Relativistic theory assesses the dimension of physical diversity (continuum) somewhat differently. According to her ideas, there is a formal relationship between the order of entry into the laws of nature of spatial coordinates, on the one hand, and the time coordinate, on the other [9, p. 280]. In the process of developing scientific thought, studies of space have been conducted within both the generally accepted three-dimensional system (some researchers believe that it is more correct to talk about a six-dimensional system due to the presence of negative coordinates) and multidimensional systems. As a result, it was concluded that from a cognitive point of view, the coordinate system should correspond to the physical state of the object. In particular, in some cases, the study should be conducted in general in one-

dimensional space, taking into account the linearity of the process, which is observed, for example, in the study of individual substances of the microworld, although, of course, should take into account the conditionality of such construction. Thus, the idea was developed that time as a temporal characteristic of the existence of the same matter in space should correspond in its characteristics to the dimensionality of the latter. Each coordinate has its own dependence on time, so in three-dimensional space and time is three-dimensional, in one-dimensional – one-dimensional. In linear consideration, time brings the gaze into the plane, in the plane gaze makes it four-dimensional, in the three-dimensional gaze – six-dimensional.

The subsequent development of scientific thought has radically changed the general idea of the laws of motion of matter and the form of such motion. In particular, it was found that the dimensions of objects and the duration of processes do not constitute objective principles, they are determined by various internal and external forces (eg, gravity and repulsion) and interactions. Time began to be seen as an ordered sequence of changing events, without change there are no processes, and therefore no time. The question of moving away from the classical notion of time, taking into account the growth of inertia at a speed approaching the speed of light, was first posed by A. Poincare in 1904 [10, p. 575]. Subsequently, a radical revision of the physical essence of the concept of time was made by Albert Einstein, who substantiated the scientific concept according to which the order of time is determined by specific material processes. Newtonian absolute time was replaced by the system's own time [11, p. 96–97], which is not an independent entity, but a derivative. The revision of the substantial theory of time, the change of concepts about the essence of space and time led to the creation of a special theory of relativity, which considers time in inseparable connection with the motion of material objects and their interaction [12]. This approach is one of the main principles of the so-called relativistic concept. Thus, based on the fact that all terrestrial phenomena depend on the position of stars and planets, science has introduced the concept of astronomical time, the meaning of which is reduced to the thesis that at each point in space there is a clearly defined time that differs from time at other points [13, c. 43].

Today, most of the exact sciences operate with the concept of "real" time, which is conceptually based on the thesis that time is uneven, multidirectional, multidimensional and depends on the properties of the system of accounting and motion of matter. Moreover, this approach is used not only by supporters of Einstein's theory of relativity (this is understandable, since the theory itself postulates time as a variable that depends on a number of factors), but also by researchers in classical mechanics. When changing distances, masses, displacements, the nature of motion, in other words, when changing the properties of the system, the time scale also changes. In classical mechanics, time depends on the nature and velocity of bodies much more than defined by A. Einstein's postulate, if we consider time as an unknown quantity, because it mainly depends on specific distances and velocities in the inertial systems themselves, and not on speed of light and speed of relative motion of systems. In other words, time in an inertial system depends on velocity much more complexly than in special relativity.

As we can see, the fundamental difference in the assessment of the temporal manifestation of matter in classical mechanics and the general theory of relativity lies in the different initial idea of time. Within the substantial concept, the properties of time are in no way related to the motion of matter and are not conditioned by such motion. The concept of time is primary, absolute, such that it does not depend on the nature and form of relations of specific bodies inside the system and outside. Instead, recognizing the existence of at least minor or even instantaneous interactions leads to the need to use relativistic time theory, which, in turn, requires establishing the nature of such interactions between different points in space to give physical meaning to the concept of time.

The theory of relativity inextricably linked space and time with matter, reducing them to the form of being the last in its motion [14, p. 1–2]. Spatial-temporal relationships are determined by material interactions between physical bodies, which, in turn, constitute the causal relationship between phenomena and, ultimately, establish their sequence in time. If, say, there are several objects at different points in space, the internal order of the processes within each of them is determined by the course of its own time and does not correlate with the course of relations in another system. Instead, tem-

poral relationships between several phenomena can exist only when the latter are related to specific physical processes. It follows that the localization of the event in space and time, ie the presence of coordinates x, y, z, t, is determined by the existence of such an interaction; the event, which is not affected by anything, would remain a specific localization [15, p. 233].

When the ratios within the system change (distances, masses, directions of movement of bodies, etc.), the time scale also changes. Moreover, as proved by Albert Einstein, such patterns are general in nature, including the mathematical regulation of actual interactions by the methods of classical mechanics. Thus at application of the specified regulatory toolkit time depends on character and speed of movement of bodies much more difficult, than by rules of the special theory of relativity at identical set values of unknown search quantity of time. It certainly depends on the specific distances and velocities within each inertial system, and depending on the order and principle of measurement, real time can differ significantly from the absolute. However, despite the perception of this fact by scientists around the world, the error at speeds of inertial motion, far from the speed of light, is quite small. Thus, based on the greater simplicity of absolute time and ease of use, the associated mechanism is widely used in systems of not very precise sciences and everyday life. In this case, absolute time is used quite successfully as the simplest model of real temporal application.

However, by and large, the conceptual questions of the essence of time are problems of philosophy. This is due to the fact that time has a special place in the lives of societies and each individual. This is one of the fundamental categories of the world around us, which concerns general concepts that express sensitive perception and its connection with reality. Awareness of events that occur in time means knowing being as such. The discontinuity of time and space has the reproduction in reality that material objects have a relative discreteness of their existence. In other words, there is a temporal and spatial differentiation of bodies. But the motion of objects is still continuous, it cannot be reduced to the sum of discrete moments. That is, time movement has a certain connection, there are no gaps in it. From the study we can draw some **conclusions**. Through the definition of the essence of such categories as space and time, a person learns about the world. Space is a form within which the interaction of specific material phenomena. Whereas time is the content of such relationships of these objects. We should note the scientific differences on the fundamental question of the mutual comparison of such defining categories as time and being. To overcome the obvious difficulties that arise in understanding the above provisions, it is necessary to move away from standard material estimates of such a phenomenon as time. In most sciences, the subject of the study of temporal characteristics is mainly the main property of time – duration. It is along with postulated qualitative factors such as homogeneity, continuity, focus on the future is the basis of all ideas about time. Based on greater pragmatism and ease of use, the scientific concept of absolute time and the associated mechanism is widely used in systems of applied sciences, including jurisprudence. Absolute time is used quite successfully as the simplest model of real temporal application, but it is necessary to understand the conditionality of the accepted application.

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ПРОБЛЕМИ ПІЗНАННЯ ЧАСУ ЯК ЕЛЕМЕНТУ ЗОВНІШНЬОГО СВІТУ

У статті досліджене актуальне питання про сутність часового перебігу у просторі та його сприйняття людиною. В роботі наголошується, що матеріальні об'єкти, суспільно-політичні взаємини, норми права, етико-естетичні принципи не можуть бути незмінними, вони обов'язково зазнають темпорального впливу. Час є тим всеохоплюючим чинником, який дозволяє здійснити сутнісний зв'язок подій і явищ, що відбуваються у просторі, надавши їм належної перцепції щодо їхнього місця у системі взаємодій різних явищ у просторі. Підкреслюється, що простір і час в природі окремо не зустрічаються, вони неподільні. Проаналізовано зміст різних наукових концепцій стосовно вивчення самого перебігу часового плину та його зв'язку з явищами матеріального світу, у тому числі щодо темпоральних вимірів розвитку юридично значимих для суспільства явищ. Оцінено наукові підходи, за якими простір і час розділяються на реальний, перцептуальний та концептуальний. Проведене дослідження онтологічного бачення темпоральних процесів, за яким матерія як філософська категорія сприймається не через окремі конкретні її властивості, а через загальний, всебічний та абстрактний характер своїх проявів. У роботі здійснений історичний аналіз генезису пізнання часу людиною, її усвідомлення факту, що час, як і простір, є неодмінним атрибутом будь-яких проявів буття. Вивчено наукове бачення часового перебігу, яке полягає передусім у зовнішніх змінах матеріального об'єкта чи іншого явища, що пов'язані з визначенням його просторово-часових параметрів. Розглянуті основні наукові моделі та уявлення про час: Ньютонівська субстанційна концепція, за якою абсолютний простір залишається всюди нерухомим і однаковим незалежно від чогось зовнішнього, а час також існує самостійно в об'єктивному Всесвіті, це певна субстанція; та релятивістська концепція Ейнштейна, котрий довів, що порядок у часі зумовлюється конкретними матеріальними процесами. З огляду на більший прагматизм та зручності користування, наукова концепція абсолютного часу широко застосовується в системах прикладних наук, в тому числі юриспруденції. Абсолютний час доволі успішно використовується як найпростіша модель реального темпорального застосування, але при цьому слід розуміти її умовність.

***Ключові слова**: пізнання часу, темпоральний перебіг, просторово-часові параметри.*