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SUBJECTIVE REALITY AND ITS DIMENSIONS: SPACE AND TIME

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Abstract. *Our theses are: First, in subjective reality, time is three-dimensional, too – same as space; and the latter can «work» in a similar way as time. Secondly, primordial time is young and not ancient. Thirdly, the locus of subjectivity is elastic and not determined by brains' boundaries. It diminishes like chagrin skin if there are no events, whereas time without events disappears at all – and vice versa. Events are the dimensions of subjective time/space continuum. Relativity of subjective time/space continuum was the starting point for discovering this relativity in objective matter, alongside with the mathematical account or ahead of it. Postmodernists' account of events important for «subjective» time is of interest.*

Keywords: *space, time, forms of subjective reality.*

Introduction

If one wanted to speak about the objective properties of space, time, and movement that connects them, s/he would start with the formulas:

S = V×T. This is an equation of non-accelerated motion from school-physics. The path travelled by a body is equal to velocity [of the mass] multiplied, or timed, by time. Distance in the equation (1) is devoid of the third dimension of space, namely, of height. It might be represented merely with a line, which image deprives it also of the second dimension of space, namely, of width. So, there is no space in this Newtonian formula. (In mechanics, however, there are other main types of motion than linear accounted for; and of these only rotary movement makes think of all three dimensions, i.e., of space). {Also, where there is mass=body, we naturally speak of space, OR volume, or three dimensions, or six main directions in which a body can move from the starting point}.

T = S÷V. Time is equal to the distance – i.e., the path accomplished by a mass (body), – divided by the speed of the mass (body). Time is yet differentiated from speed here. And the mass of the body merely indicates what power, or energy, is needed in order to move this body from its place or change the direction of its movement.

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$m = E \div c^2$. This equation from Einstein's theory expresses the fact that mass and energy are the same physical entity and can be changed into each other. Mass is equal to energy divided by the square of the speed of light. And since the speed of light is very high, it is possible to create a situation in which a body of a small mass turns into a very large energy.

$E = m \times c^2$. In this equation, the most popular one, the [increased relativistic] mass of a body times the speed of light squared is equal to the kinetic energy of that body, or, energy is equal to mass multiplied by the square of the speed of light. Time, evidently, is not differentiated from speed here; so there is no time in Einstein's formula – except that in expression «mass of a body times the speed», which doesn't hint that there is only one direction of movement – from past to present and then to future [5].

However, our main concern here is the subjective properties, i.e. perception of space, time, motion and events that connect them.

It is known that there is both similarity and difference of physical time and space; similarity lies in their objectiveness and universality, whereas difference remains at least in one-way traffic (axis) of time and three symmetrical directions (axes) to move in space. It is also well-known that perception of those is different from physical time/space continuum itself. It is not just occasion or coincidence that Augustine and Heidegger both argued that time exists only in soul, i.e. in subjective reality – as memory, intuition, and expectation, – and not in the least in physical reality.

Forms of subjective reality do construct our inner world no less but even more significantly than their physical referents form the realm of matter.

Subjective reality versus objective one

The first question that easily comes to mind is: how can we expect to find – or construct – a general image of subjective reality and its dimensions, if there is no hope to even shape a general picture of objective reality, except Parmenides' Being – i.e., the sphere of light?

The question is no harder – though not of course easier – than that of discovery or inventing anything general.

Indeed, if one observer is set in the airplane, and the other one remains on the surface of the earth, and both decide to measure the speed of the light signal flying from the tail of the plane to its nose, then the distance traveled by light will be different for them. And since speed is the distance divided by time, they will also disagree on the question of how much time has passed between sending and receiving a signal. Time, even if it is taken to be a form of existence of matter as materialists take it, is not absolute. You cannot signify the time of the event so that everyone agrees. On the contrary, each observer should have his own measure of time, and two observers being in different inertial systems will receive different time data.

We know about an experiment with a very accurate clock which was sent to a world flight to test this theory. When it registered a gap of 0.000002 seconds compared to the clock on earth's surface, many philosophers – we now speak of the idealists – believed again that space and time are subjective.

In the list of Aristotle's categories, there is only one denotation for time (χρόνος), whereas space, or rather place, regards three (τόπος, πλάτος, – plane, and χώρος – something extending).

Kant, as it is well-known, removes space and time from this list, ascribing them a special status of sensuous intuitions presenting objects, corresponding to outer and inner senses, respectively.

In his «Critique of Pure Reason», in the «Transcendental Aesthetic» Kant argues that space and time are pure forms of intuition inherent in our faculty of sense. Here we find what can be called Transcendental interpretation of the concept of space – and at the same time its most inner, subjective description: Space is nothing but the form of all the phenomena of external senses, i.e. the subjective condition of sensuality, in which external is possible for us. The ability to be exposed to objects must necessarily precede any contemplation of these objects, so it is clear how the form of all phenomena can be given in the soul before all real perceptions, therefore, a priori; it is also clear how, as pure contemplation in which all objects must be defined can, to all experience, contain the principles of their relationship to each other [4].

Augustine the Blessed before Kant, and Martin Heidegger after Kant, both believed that time exists only in the consciousness of a human being: the past is memory, the present is intuition, and the future is expectation. In nature, there is only the ever-lasing present.

In the same way, we can speak of space, of extension, etc. only from the point of view of man. If we ignore the subjective condition, – the only way, in which we can receive ex-ternal in-pressions, because we are able to be exposed to objects, – the idea of space means absolutely nothing. This predicate can be attributed to things only if they appear to us, i.e. if they are objects of sensuality. The constant form of this susceptibility, which we call sensuality, is a necessary condition for all relationships in which objects are contemplated as being outside of us; this form, apart from these objects, events, and appearances, is pure contemplation called space.

In postmodernism, the problem is posed as follows: what will be the primary concept, or where to start in order to reach the absolutely pure subjective authenticity? Are subjectively implicit presuppositions better than objectively explicit ones? Is it necessary at all to «begin» with something objective, and if necessary, is it necessary from the point of view of subjective reliability?

There is no direct answer, and it is in vain to ask oneself whether Augustine the Blessed or Descartes or Kant or Heidegger was right or wrong. According to

Deleuze and Guattari (1, p. 47), Descartes has created his cogito eliminating time as a form of pastness, and making it a simple form of succession. Kant is supposed to have introduced time into the Cartesian cogito – because only in time my indefinite existence turns out to be determined. However, this is a completely different (concept of) time than mere precedence: time becomes a form of insidedness, in which there are three components: succession, simultaneity, and consistency.

From this a new concept of space follows, which can no longer be determined by simple simultaneity, but becomes a form of appearance. «Space», «time», and «I think» are the three original concepts in Kant. It is a well-structured subjective reality to which all postmodernity owes its Universe in the XX century.

In fact, one has to say «Raum», «Zeit», and «[Ich]fühle».

«Outer sense is the only way in which we can become aware of external objects. For this reason, it is the only stage of our coming to know objects at which we can ourselves give spatial relations to all external objects. Therefore, the spatial relations postulated in geometry must be due to the structure of our outer sense» [2, p. 1] – as Jaakko Hintikka arguers (1969).

An unknown «ghost» author in Wikipedia tries to demonstrate, under the rubric «Russian historical library», that Kant's list of categories can be deduced from one source, namely, time. S/he writes: analyzing, in his transcendental analytics, the question of how the a priori (pre-experimental) emergence of 12 main categories is possible, Immanuel Kant comes to the conclusion that they are not given to the mind as «pure ideas» at once, but are borrowed from the concept of time in the form of «visual images», from which, by simple intuition, it is easy to move on to ideas. These visual images that create ideas, Kant calls schemes. His doctrine of schematism bridges the world of sensory perceptions and the sphere of rational thinking.

A priori «intuition» of time serves as a «mediator" between the contemplation of the senses and the concepts of the mind. Although time, like space, belongs to the sphere of sensible things, it is less material than space and more suited to the completely abstract nature of categories. By its similarity with categories, the concept of time serves as an image or symbol for expressing a priori concepts in sensual forms and becomes, as it were, a translator between contemplative ability and reason, which could not work on the formation of judgments without it.

Considered as a series of moments or as a number, time gives consciousness an image (scheme) of the concept of quantity (magnitude). The image of the concept of the universal appears to our mind as a whole of all moments of time. The quotient is contained as a scheme in a certain, arbitrary number of them. We grasp the concept of the unit (unique) from the contemplation upon one moment in time. To signify the notion of quality, the content of time serves a symbol (reality is time filled with events; negation is a time in which nothing happens). Time also serves

as a symbol for categories of relationship: as duration, it creates a scheme from which the concept of substance emerges in us; as a sequence of moments – a scheme of the concept of cause and effect; as simultaneity – the concept of interaction and combination. Finally, time gives us a symbol for understanding the category of modality: something that meets the conditions of time is possible; the real or the present is that which exists at a certain time; something that stands forever is necessary. Therefore, the concept of time serves as a framework for a priori concepts of understanding; it is like a stage of an ideal building for which feelings deliver stones, and the mind is cement. This is the use that the mind makes from the notion of time as an intermediary between itself and sensuality. It is called, in the language of Kant, the schematism of pure reason.

Having no purpose to indulge in Kantian theory of knowledge here, we just want to emphasize great possibilities lying within the concepts of time and space. Of course it is an occupation of mind, and thus subjective reality; however we cannot seriously consider space/time to be merely forms of human sensitivity; though, presumably, they can play this role perfectly – where and when are the first coordinates of any event existing at a location in space and at a specific time – but, just plain enough, if we remove the «I thinker» (Cartesian cogito, the knower, the agent of cognition), simply if we regard the Earth before any human appeared, – we are forced to accept objectivity of space and time.

The flow or course of time was not always symbolized by an arrow or a river; more often than not it was a circle, and many languages attest to it. For example, in the famous «Heimskringla» – Icelandic sagas, we meet words denoting both natural events and ‘sections’ of time: är – both ‘year’ and ‘crops grown’, tīd – both ‘time’ and ‘tide’, hrīš – is ‘storm’ and a certain period or season. The ‘arrow’ of one-directed time appeared only with Christianity and its soteriological claims.

At least we can agree that space is symmetrical. In many languages, one can speak of height as the depth: it is the same vertical, just going «up» or «down» in relation to the observer’s position. Greek great word «bathos» means both. In Russian we often say «глубина небес» instead of «высота».

With all this in mind, we can argue that even objective space and time are not absolute, let alone subjective space and time which prove to be completely relative and unique; and every and any person can affirm the same: the world of my soul is my world, with all its peculiarities, – and even more so, the world is my world, and the «outer» object is a complex of my own sensations.

The last phrase is an emblem of subjective idealism; empiriocriticism, for one, to which a materialist cannot agree.

However, we should not be too hasty in dismissing «the whims of the individual psyche». This is not merely «buzzing in someone’s left ear». Phylogenesis and ontogenesis are one and the same «genesis». It would probably not be wrong to say that consciousness of any human being is the culmination of subjective reality.

Human being is the crown of the development of life, and s/he is evolving towards the elimination of coarse animal forms of existence towards more elevated, ideal ones. Basically, the steps of spiritual growth are understood as ethical perfection, «human behavior». They, however, are not identified in science; it's the realm of philosophical interest – and literature. For example, M. Meterlink wrote in «The life of the bees» (1901): «No one other than us was assigned to produce that strange substance that we call thought, intelligence, reason, soul, spirit, brain power, virtue, kindness, justice, knowledge; although it has a thousand names, but its essence is the same... man has the ability to disobey the laws of nature, and the question of whether he is right or not, using this ability, is one of the most serious and least clarified points of his moral being...» One of the famous Russian evolutionists, V.A. Krassilov, thought that a possible reason for the emergence of the Great Russian literature of the XIX century was a moral protest against the penetration of the ideas of «natural selection» into Russian society as an apologetics of «total evil». And surely all great writers were also sensitive about space and time as forms of subjective reality constructing our inner world: remember for instance Marcel Proust's «À la recherche du temps perdu».

Subjective reality is not just sensuality and intellect. We believe that consciousness and especially thinking in man are necessarily related with morality [10, P. 33]. Every more or less complete philosophical system begins with physical observations, continues as logic or gnoseology (or both), and ends with ethics and anthropology. Epicurus and Kant go the same path in this constructive work. Hegel also made such remarks: the most concrete and the most subjective are richer than general, and subjectivity = freedom, or goal, or conscious striving. Already Aristotle in the «Nicomachean Ethics» indicated that happiness of a person is the activity of the soul in the implementation of virtue (aretē).

It is at that stage of spirituality which is called morality, or ethics, that relations between people concerning good and evil become and remain dominant.

Subjective reality, a synonym for ideal reality in Russian philosophical literature since the end of the XXth century, is a good explicand for consciousness, provided that it does not exclude the pre-, un-conscious and sub-conscious.

However, we as scientists accept the old principle of materialism: subjective reality reflects objective one. Good and evil as moral concepts reflect life and death. Both «realities», objective and subjective, are real, which means they do exist: but one is independent of our feelings, thoughts, and will – although human practice can be aggressive enough to put an end to nature with all its seeming independence – and the other reality is our feelings, thinking, and will. Seemingly dependent of us only, they in fact are dependent on our physical nature and spiritual essence (which often come into a dramatic split) – and on objective reality, which is matter exposed or appearing to us, producing sensations.

Einstein discovered that mass and energy bend space/time continuum, creating a force of gravitation. When it comes to velocities as high as the speed of light, distances shorten, space shrinks along the lines of the force field, that is, perpendicular to the (star's) surface in orthogonal trajectories; therefore, space itself is curvilinear. The verification of Einstein's theory of curvature of space came on September, 14, 2015, when the vibration of the L-shaped antennas of the Laser Interferometer Gravitational-Wave Observatory was recorded.

From the subjective perspective, human attraction also is power (energy) that essentially changes, if not bends, the space/time subjective continuum, making time accelerate or stop, and taking space to work as time not on the basis of Einstein's theory, but entirely on experience of living in everyday Lebenswelt. For example, time shortens – or even collapses! – when you enjoy it; the happy moment turns to ever-lasting one. And, when in grief, we can use the opposite opportunity; traveling far has the same effect on the soul as if great many years passed from the moment of catastrophe that brought grief. Time, «a great healer», lasts and continues congruently with the distance covered, to make you live a longer period of life and leave the day of the catastrophe behind; whereas it treacherously slows down and turns to infinity when you sit at your son's grave.

Regardless of the impossibility of constructing a time machine in objective reality, we have a wonderful compensation for that in the realm of subjective reality. Besides, instead of only one dimension of objective time, consciousness provides for many, most important of them being the same three «spatial» dimensions. In our memory and imagination, in our instant flash of insight, things existing in past or imaginary events of the future are presented to the mind as having volume. Images do have length, width, and height; they are shaped, they have size, they are magnitudes no less valuable than physical objects. In addition, they are painted – in past time more colourful than in the future, but still imaginary future flows in pictures, too.

Another problem of human subjectivity in dealing with time is our strange and inconsistent manner of considering past time both ancient – and young.

When Merry Christmas comes, the unavoidable guest and even host of the feast is Santa Klaus, – Old Year, in fact. And in many countries he is accompanied by a boy – new-born year (sometimes even by a young girl, «Father Frost's» granddaughter Snow-maiden). Russians even have two New Year feasts: according to Gregorian and Julian calendar; and one is called New Year's Eve, and the second one – Old New Year's Eve. But Father Frost – in fact, Granddad Frost – is OLD at first place. His time is gone, or passing away quickly, and we call this past time even ancient, picturing the regular image of old age: weakening, senility, decrepitude, … tombstone. Epitaph.

Inconsistency comes along when we say: «at the dawn of civilization», «in the beginning of time…».

In the beginning one is newly born and not elderly, unless s/he is Benjamin Button, right? People, peoples and civilizations are young in the beginning.

So, the primordial time is young, and not ancient. For example, the first steps of philosophy (and science) is its youth, not old age. Ancient Greeks are young; WE are old, with our postmodern entangled, eclectic erudition, our vast and chaotic knowledge, with our burden of irony replacing easy childish laugh, with accumulated cargo of hereditary diseases, with our disbeliefs and inability to sincerely wonder and rejoice. As Joseph Brodsky wrote once in his famous «Letters to the Roman Friend»: «…an old slave told me once before the tavern: 'when we turn back, what we see is only ruins...' The view is certainly very barbaric, but true».

This perception of past as ruined, and thus «old», we could presume, is an effect of onto/phylogenetic projection: each embryo's developmental stage represents an adult form of an evolutionary ancestor. Haeckel's law, or motto, Ontogeny recapitulates phylogeny, established that living organisms in the stages of individual ontogenesis, before birth, do pass through all the stages of development that their evolutionary ancestors went through. Genera come before species.

«The stages an animal embryo undergoes during development are a chronological replay of that species' past evolutionary forms; moreover, the stages of development for an animal embryo are the same as other animals' adult stages or forms» [9].

Besides, the embryos of all classes are really similar to each other.

Didier Raoult, a prominent French physician and microbiologist, suggested that it was giant DNA-containing viruses that best suited the role of the common ancestor of all living things – LUCA (last universal common ancestor). It is believed that the virus lived on Earth about 3.8 billion years ago. Its fossilized remains have not been preserved, but it can be studied by comparing the genomes of all existing and all already extinct living organisms.

Subsequently, it turned out that the law is incorrect – and for several reasons. Many biologists opposed it in the early twentieth century; for example, it was discovered that in the case of neoteny, the adult stage of the [underdeveloped] descendant species resembles the larval stage of the ancestor species, and not vice versa, as would be expected with full recapitulation. Probably we could call it «secondary savageness», with respect to human beings… However, the law served science well; moreover, it served ordinary, «pedestrian» mind well: all of us repeat the history of all living forms; if we are heirs and «they» are ancestors (embryos represent adult forms of evolutionary ancestors), then we are young and they are old, judging «from the present».

As materialists, we admit the principle of reflection: Phylogenesis is a sequence of ontogenesis; therefore, changes in adult forms during phylogenesis can be based only on changes in ontogenesis reflecting the latter as its model. But that doesn't quit the

fact of our curious perception of, so to say, «contramotion» of time in subjective reality: pacing forward, always forward, this great magus makes us live through the ancestor's «future-in-the-past». Like planets abandon their orbits and fly moving, visibly, backwards due to the gravity of an invisible mass, like stars change slightly their linear movement attracted by invisible planets and draw backwards, so we humans, in our memories or searching in history, find ourselves in «good old days» attracted by some view or event, three days before today or thousands aeons before our era and from that starting point we return, drawing a recursive, backward loop, to our life-orbits following the river of time, forward, again.

And here we come to our third thesis.

Subjectivity is not determined or bordered by brains' boundaries.

There exists the «event horizon» in objective reality, within which the universe is what we know of her. To put it accurately, in other sense the «horizon» is the border of the black hole. The more matter and light is drawn into the black hole, the larger it becomes, and the horizon moves apart. This border is like the edge of a waterfall: if you stand over it and paddle very quickly, you have a chance to escape, but if you fell over the edge you are doomed. Postmodernists often speak about additional dimensions of subjective reality: «Concepts are events, and the plan is the event horizon». (Deleuze, Guattari). It is not a relative horizon functioning as a limit; it is a force capable of structuring chaos.

The well-known transition to postmodern culture was marked by philosophical distraction from the linear «reading» (interpreting) of historical process, and thus of time. The latter was estimated as meta-narrative and as such is subjected to desacralization (Baudrillard). Causation cannot be invoked to interpret history; eventuality is about the relation of effects between each other. Deleuze sees the meaning-generating potential in the process of «communication of events». The initial premise of constructing a non-linear model of historical temporality is a radical rejection of the classical differentiation of the past, present and future as three single-order temporal modalities. According to Deleuze, they form two [and not three] «readings» of time, each of which is complete and excludes the other, or rather they meet as depth and surface: one is made up only of the interlaced present [moments], and the other is constantly decomposed into protruding past and future. These are «Chronos» – «physical and cyclical Chronos of the ever-changing present» – in its entirety, in the absence of unambiguous orderliness and openness for the formation of various and numerous event chains – «Aeons», stretching from the past through the present to the future. Time event in Aeon never gains the status of universality, whereas Chronos never becomes linear.

Here we can recall fragment 910 of Euripides: αθάνατου καθορων φύσεως κόσμον αγηρω [He is] contemplating on the immortal natural perennial [never-becoming-of-age] Kosmos…

Instead, Aeon of Deleuze is eventfully filled and therefore represents specifically-defined fate [8]. (Mozheiko, 2012). As a condition necessary for the constitution of Aeon, Deleuze considers that it is inscribed in the bosom of Chronos, i.e. the philosopher posits the external event context.

Subjective reality reflects objective one in this respect: there is an «event horizon» within which the «I thinker» (the knower, the agent) develops the inner personal world. It diminishes like chagrin skin if there are no events, whereas time without events disappears at all – and vice versa. Events bring additional dimensions to the subjective time/space picture.

In Deleuze and Guattari, there is a relative horizon functioning as a limit, changing depending on the observer's position and covering the observable state of things, AND an absolute horizon that is independent of any observer and in which the event, that is, the concept, becomes independent of the visible state of things, or the scene in which events can play*.

Conclusion

A journey through the universe is a journey not only in space, but also in time. In objective world, using the speed of light, astronomers measure the distance. The longer the observer gazes, the farther he looks into the past – which, as we know, was the youngest period of Universe's existence.

In subjective reality, people who have «much memory» (T. Hobbes' s expression) also gaze into the past. Learned people follow the history of nature and culture; all the rest reconstruct their own life-stories. Meanwhile, unlike astronomic observations carrying us to the beginning of time, in subjective reality people can also travel to the future times – in their (our) expectations. And both, the past and the future, as of course the present, are voluminous – time plays as space in our memories and imagination.

Isn't it amazing, however: in objective world, near the massive star, time slows down, and the distance decreases along the lines of force; whereas in subjective reality, it is vice versa: s/he who travels much, grows mature faster, i.e. gets (as if) older and feels as if much time has passed swiftly; distance grows, time shortens or collapses.

Time and space are not events in themselves – but they are measured with events.

Mathematicians often speak about additional dimensions of the objective reality, beside physical time/space. Philosophers talk about the additional dimensions of

*In a Footnote, there is a reference to: Jean-Pierre Luminet, "Le trou noir et l'infini", in Les dimensions de l'infini, Institut culturel italien de Paris. This author distinguishes relative horizons – such as, for example, the earth horizon, having an observer at its center and moving along with it, and an absolute horizon, an "event horizon" independent of any observer and dividing all events into two categories – visible and invisible events, reported and unreported.

subjective reality. Such are, for example, «Aeons», i.e., series of events in Deleuze and Guattari, which are organized on the basis of definite relations of singularities to each other. And grave χρόνος, Chronos, Heideggerian Zeit identical with Sein, in its turn, is eternal and immeasurable.

The postmodern authors, however, call concepts «infinite velocities of finite motions», and these «infinite velocities» are the main problem of philosophical thinking. Philosophy creating concepts is always a mighty Oneness, Einheit – unfragmented, though open; this is boundless All-integrity, Omnitudo.

And – this is subjective reality as a realm.

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СУБЪЕКТИВНАЯ РЕАЛЬНОСТЬ И ЕЕ ИЗМЕРЕНИЯ: ПРОСТРАНСТВО И ВРЕМЯ

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Аннотация. *Известно, что существует сходство и различие физических времени и пространства; сходство заключается в их объективности и универсальности, а различие – по крайней мере в однонаправленности (оси) времени и трех симметричных направлениях (осях) пространства. Хорошо известно также, что их восприятие отличается от самого физического пространственно-временного континуума. Наши тезисы таковы: во-первых, в субъективной реальности время тоже трехмерно – как и пространство; а пространство может «действовать» аналогично времени. В состоянии глубокого горя мы можем использовать эту возможность; дальние путешествия оказывают успокоительное воздействие, как если бы с момента катастрофы прошло много лет. Во-вторых, изначальное время молодо, а не древне. Например, первые шаги науки – это ее молодость, а не старость. Древние греки молоды; МЫ стары. Такое восприятие прошлого как разрушенного и, следовательно, «старого» является следствием онтогенетической проекции (закон Геккеля). В-третьих, локус субъективности эластичен и не определяется границами мозга. Он уменьшается, как шагреневая кожа, если нет событий, а время без событий исчезает вовсе – и наоборот. События – это измерения субъективного пространственно-временного континуума. Относительность субъективного пространственно-временного континуума была отправной точкой для открытия этой относительности в объективной материи, наряду с математическим объяснением или раньше такового. И Августин, и Хайдеггер утверждали, что время существует только в душе, то есть в субъективной реальности, как память, интуиция и ожидание, – а ни в коей мере не в физической реальности; и это не просто случай или совпадение. Пространство и время как формы субъективной реальности конструируют наш внутренний мир не менее, а более существенно, нежели их физические референты формируют существование материи.*

Ключевые слова: *космос, время, формы субъективной реальности.*

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