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Does Time Really Exist as a Fourth Dimension of Space?

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Abstract: Regarding experience of time, a scientist should trust more his eyes than his mind. With eyes one can perceive time only as a stream of change. So one has to doubt about existence of physical time in which change runs. On the basis of the elementary perception (sight) one can conclude that physical time exists only as a stream of change in space. The image of four-dimensional space-time has developed into the image of four-dimensional space in which irreversible change runs. This understanding is essential for further development of science which will include conscious experience as its consistent part. Rational experience is based on analysis, it deals with the elements of the universe (stars, planets, living beings, atoms and so on) in separated way. Conscious experience instead reconnects the scientist (the observer) and the universe into a whole. It reaches beyond the duality subject-object.
Keywords: time, space, space-time, physical time, physiological time, rational experience, conscious experience.

Introduction

In the universe, the passing of physical time cannot be clearly perceived as matter and space; one can perceive only irreversible physical, chemical, and biological changes (hereinafter referred to as "change") in cosmic space. On the basis of elementary perception (sight) one can conclude that *physical time exists only as a stream of change* that runs through cosmic space [1]. The terms "physical time" and "change" describe the same phenomenon. Physical time is irreversible. Change A transforms into change B, B transforms into C and so on. When B is in existence A does not exist anymore, when C is in existence B does not exist anymore.

The question arises: Why is it that irreversible physical time is experienced as past, present and future? The answer is obtained by analysing the scientific way of experiencing. The eyes perceive a stream of irreversible change. Once elaborated by the mind, the stream of change is experienced chronologically through psychological time that is a part of the human mind. By observing the continuous stream of irreversible physical change humans have developed psychological time through which we

experience the universe. Psychological time is reversible. One can go back into past. This creates an idea that physical time also has a past, but this is not so.

General Relativity allows for speculation about time travel. Someone could travel through a black hole with a spaceship, go back into the past and kill his grandmother. The consequence is that he could never have been born [2]. Travelling into the past through black holes is not possible because physical time is irreversible; the past exists only as psychological time through which it is not possible to travel with a spaceship.

Experiment

Let's look at the relationship between physical and psychological time by carrying out an experiment. Take a pen and move it from the left side of the table to the right. You can perceive only the movement of the pen in space, but you experience that the pen has also moved through time. How come? Perception passes first through psychological time and then the experience occurs. That's why you experience the movement of the pen in time. But on the basis of elementary perception (sight) one can only state that the pen has changed position in space.

Discussion

It is not that change happens in physical time, change itself is physical time. We can measure with clocks the duration and speed of change. Experiments with high precision clocks confirm that change runs slower in the parts of universal space where the gravitational field is stronger. The speed of clocks near the sea in Venice is slower than on the mountain Monte Rosa, because gravity is stronger near sea level [3].

Regarding General Relativity this means that with increasing of the roundness of the space the speed of change is getting slower. Regarding Special Relativity this means that in inertial system that moves fast the speed of change is slower than in inertial system that moves with less speed. The twin in a fast spaceship is growing old slower than his twin brother in a spaceship that travels with less speed.

The understanding of physical time has changed over the ages. For ancient Greeks, Indians, and Mayans, time was considered a cyclic phenomenon; time moving in circles, with no beginning and no end. When Judaeo-Christian civilization arose in Europe, another understanding of time became prominent - time going forward in a straight line. According to this civilization, time has its beginning with God's creation of the universe and will have its end with the Last Judgement. In Newtonian physics, physical time is an independent quantity (absolute time), running uniformly throughout the entire cosmic space (absolute space). In the General Theory of Relativity, time is no more an independent physical quantity - it is linked with space in four-dimensional space-time. According to this understanding time as a physical reality exists only as a stream of change in space.

The speed of psychological time does not always follow physical time, it depends on one's well-being. The more relaxed you are the slower the speed of psychological time is. In modern society time passes quickly, in so called primitive societies time passed slowly. In an altered state of consciousness, such as meditation, ecstatic dance, deep prayer, psychological time almost seems to stop.

Already in a normal state of health there are, every now and then, aberrations of subjective time such as acceleration or deceleration of lapse of time. Under several

mental disturbances (like those characterising serious mental psychoses, drug-induced states, trances, meditations, as well as other deep "altered" states of consciousness), these anomalies / peculiarities become more pronounced. The flux of time may even cease completely (the sensations usually described as "time standing still", "suspended", or "arrested" time, or expanded without limit such as the feelings of "everlasting now", or "eternity") [4].

In altered states of consciousness one has the capacity to observe (to watch) his/her mind. Observing (watching) the mind is a function of consciousness. Watching is an individual research method [5]. Everybody can observe his thoughts and emotions. By observing them the speed of thought, the intensity of emotion calms down. Once the mind stops, psychological time stops too. One experiences physical time as he/she perceives it: as a stream of change in space.

The scientist (the observer, the watcher) is a consistent part of the scientific experiment. He/she observes the experiment and measures it with instruments. Without an observer, scientific experiment can not exist. When observing the experiment, the observer can also simultaneously observe the way mind elaborates the experiment. He/she becomes aware of how mind's elaboration influences experience of the experiment. With this awareness, rational experience of the experiment is enriched with conscious experience. Having conscious experience, one experiences exactly what one perceives. Conscious experience is direct, the mind does not interfere between perception and experience.

conscious experience

universe - perception (senses) - conscious experience

Rational experience is indirect. Perception and experience are separated through the rational activity of the mind. Information enters the senses and goes into the rational part of the mind where it is elaborated through logic and mathematics, and thereby becomes an experience.

rational experience

universe - perception (senses) - elaboration (mind) - rational experience

Through rational experience one experiences stream of change as linear time. Conscious experience reveals stream of change as an irreversible process that occurs in timeless space. Regarding experience of time a scientist should trust more his eyes than his mind. With eyes one can perceive time only as a stream of change. So one has to doubt about the existence of physical time in which change run. On the basis of the elementary perception (sight), one can conclude that physical time exists only as a stream of change in space. The image of space-time has developed into the image of timeless space in which irreversible change runs. This understanding is essential for further development of science which will include conscious experience as a consistent part. Rational experience is based on analysis, it deals with the elements of the universe (stars, planets, living beings, atoms an so on) in a separated way. Conscious experience instead reconnects the scientist (the observer) and the universe into a whole. It reaches beyond the duality subject-object.

In cosmology, space is mostly described with Euclidian and Riemann geometries. Euclidian geometry is based on the theory of numbers. Regarding the theory of numbers natural and real numbers are both infinite and at the same time there are more real numbers than natural ones. Real numbers are composed of algebraic and transcendental numbers, with natural numbers we can numerate only algebraic numbers. Logicians confirm that there is no contradiction if we say that the infinity of natural numbers is smaller than the infinity of real numbers and also if we say that they are equal [6].

By numerating each mile of a straight line with natural numbers we will get an infinite distance and by numbering a parallel line with real numbers we will also get an infinite distance. If we say that the infinite distance made out of natural numbers is shorter than one made out of real numbers there is no contradiction; if we say that they are equal, there is also no contradiction. So an infinite distance does not mean a real existing and measurable distance; infinite distance + 100 miles = infinite distance. That's why the application of an infinite distance in cosmology creates difficulties. In the universe we can observe and measure only finite distances between objects. When we imagine that universal space might be infinite as is Euclidean space, we do not know exactly what this means. With the application of Riemann's geometry in cosmology, the experience of infinite three-dimensional cosmic space changes into the experience of finite spherical four-dimensional space. Rational experience of the cosmic space is indirect, limited by geometrical models through which one experiences it. By having a conscious experience of cosmic space one experiences it directly.

Conclusion

In General Relativity Theory time is already half "absorbed" by space, here it exists only as a "by-product" of the matter that continuously changes in the cosmic space. In the cosmic space itself time does not run. Conscious experience allows us to experience time and space as one perceives them.

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