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## THE PHILOSOPHY OF THE EAST AND THE PRESENT-DAY INTERPRETATION OF THE PROBLEM OF MEASUREMENT IN QUANTUM MECHANICS

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A comparative analysis of the process of measurement in classical and quantum physics is given. It necessitates the expedience of the reexamination of the role of the researcher and his consciousness in the process of the interaction of the subject with the material world around him. A survey of the philosophical aspects that pertain to the problem of measurement in quantum physics leads to the conclusion that the scholar is not an independent observer of the material world beyond him, he rather becomes a part of this world to an extent that he brings pressure to bear on the properties of the observed objects. In other words, man becomes an integral part of the universe hence the classical assumption about the existence of the objective reality that is beyond the consciousness of man ceases to be relevant. That is why the philosophical treatment of the problems of quantum theory appears to be much closer to the philosophical principles of the East than to the more common here Western philosophy.

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Quantum mechanics is a thing in itself (“res in se”), until the full interpretation of their findings derived language of mathematics. Without such an interpretation it does not exist, for the adequacy of its nature can only be confirmed by the interaction of the human mind with the appropriate material objects. This interaction requires the use of the device, which is conceived, designed and constructed by the researcher. This unit belongs to the macrocosm, its design is based on the concepts of macro that reflect the macrocosm of the mind. For the convenience of further human interaction with the aid of an object is called the dimension. Thus, quantum mechanics becomes part of knowledge in the conventional sense, when it established the link between the findings of logical constructs in the shape of mathematical symbols, including numbers and displays devices that are designed to confirm these findings. Measurement procedure includes the following three elements: the object, the human mind, where the corresponding fixed «picture» of the object, and a bridge – a device that consider both a conceptual information channel. It contains the essence of the material, which consists of media (leaders) of the information and signals (pulses – sound, electrical, optical, etc.) in which the encoded information received from the object. The output of this channel have already decoded to obtain information that our brain can perceive. Content-conceptual content of this information is an ideal component of conceptual information channel.

In classical physics, the measurement performed on the object macrocosm that is the source of concepts formed by the perception of our senses and the outside world that adequately describe this place. Then the problem of decoding is trivial. In other words, in this case we “speak” the same language with the object and therefore can easily to him, “explain”. That is if we do not know the state of a physical system or know it completely, perform measurement and supplement the information which we lacked. There are no fundamental limitations to obtain information on the physical system, i.e., the numerical value of a complete set of variables that characterize the physical conditions within the framework of classical physics. In this case, there is no doubt about how this information is related to the state of the system to measure – it just expresses this condition.

For example, if we measured the speed of the plane that flies over us, and found that it is equal to 700 km/h, it would be strange question, as this speed was at the time of measurement. After all, to determine the speed of the aircraft when it flew over us, measurement was performed – in the end we found that it was 700 km/h. This situation is easy to triviality – the point in space above us (the position of the plane), he had a speed of 700 km/h!

Simple pattern measurement in classical physics due to the fact as in classical physics to understand reality. Namely reality – everything that exists objectively, regardless of measurements. Measuring merely gives particular information about reality. Our consciousness is simply records the relevant information and the fact of her awareness of the physical condition of the aircraft (its location and its speed) does not affect the trajectory of its movement.

In microcosm, which is subject to the laws of quantum mechanics, such a simple picture is not for classical notion of reality and the classic idea of it is incompatible with quantum theory. Consider measuring the speed of microparticles (eg, electrons). Suppose that it was 107 cm/s. Decoding this information should be in accordance with the quantum-mechanical understanding of the measurement process. In this case, the question, what was the speed of the particle at the time of measurement is meaningless! In quantum mechanics say that at the time of measuring the particle does not have any defined speed. Just because measurement and understanding of its results, we argue that speed 107 cm/s – that made her such a measure. What still maintain quantum mechanics of particle velocity to measure? The answer gives one of the fundamental principles of quantum mechanics – the superposition principle [1]. According to him, the measurement of particles concentrated state (superposition was, included) states compatible with all the conditions of the experiment the values of velocities. The process of measuring, oriented to the determination of the particle in this superpositional state allocated one – a state at a rate 107 sm/s. Repeating the experiment under the same initial conditions likely to give different meaning speed. Multiple (at least hundreds, is better – a thousand times) repeat the experiment detects the range of velocities that are superpositional original condition - we will receive their distribution by numerical values. This is the kind of distribution of the application of mathematical apparatus of quantum mechanics – it can be used merely to determine the probability. This means that the measurement we can merely hope for a particular outcome with some probability. Only repetition measurements give us values of velocity statistics framework compatible with the predictions obtained in quantum- mechanical calculations corresponding probabilities. Thus, the “decoding” the information obtained in the performance measurement of object microcosm, can only be the language of probability. This defines what is called the statistical nature of quantum theory.

What is the situation regarding the location particle (its coordinates)? As is the case with speed, quantum mechanics can give merely possible statistic values of coordinates, i.e. the

probability of any particle locations that are compatible with the conditions of the experiment, however, are fundamentally different. If your experiment focused (cooked) to measure the speed, it is fundamentally not applicable for measuring coordinates, and vice versa. If the particle is in a state of the exact value of momentum  $p$  (the product of mass and velocity), the quantum mechanics of Heisenberg uncertainty principle [2] argues that it is with equal probability can be anywhere in the universe. If this condition is superpositional with the spectrum of the pulse within certain limits  $\Delta p$ , then the probability of the provisions of  $x$  are nonzero within  $\Delta x$ , and product  $\Delta p \Delta x \approx \hbar$ , i.e. cannot be zero – if increasing  $\Delta p$ , a growing amount of possible positions  $\Delta x$ , and vice versa. This is the reason it is impossible to determine in a single experiment and velocity (momentum), and its coordinates (position), because these two features are incompatible with each other. This situation is the absolute opposite of the situation in classical physics, where the state of the system (i.e., reality) first identified a pair of values: the coordinate – momentum precise simultaneous measurements of limited accuracy unless the means, that is a purely technical problem. For increased precision instruments classical physics does not impose any restrictions, i.e. within it simultaneously  $\Delta x \rightarrow 0$  and  $\Delta p \rightarrow 0$  is in principle possible. In quantum mechanics, as already mentioned, the situation is quite different. Definition of Terms and pulses require the use of a fundamentally different devices. In one case, a measurement of superpositional prepare a state with a definite value coordinates – any one reality to another – a state with a definite value of momentum – a different reality!

Niels Bohr and Werner Heisenberg in the late 20-ies of XX century proposed the so-called Copenhagen interpretation of the process of measurement in quantum mechanics, which has gained general acceptance, although almost 20 years it is not perceived, including Einstein. The above analysis of measurement in quantum mechanics is based on its Copenhagen interpretation. In addition to the above principles, the interpretation covers the so-called principle supplementarity Bohr [2], which states that measures such as position and momentum require setting different experiments, of which we can say that they complement each other. Add that among physical characteristics, which make to describe the state of a physical system, there are other pairs of variables (energy, time, angle, angular momentum), subject to the Heisenberg uncertainty principle and, therefore, the principle supplementarity Bohr.

So do two things.

First, quantum theory to interpret the results of measurements have to use the language of probability. That is, we can never exactly say where the microparticles in my point that it has momentum and thus predict how will a particular atomic or subatomic process. All that can be foreseen is relevant probabilities. Summarizing the results of the measurements, we argue that not only is the particle at a particular time in a particular place, as can be without having momentum, and that it may have atomic phenomena not only occur in a certain way, but can occur in some way. It is a payment for the probability that the measurement procedure in the triad: object – information and conceptual channel – man, the last two elements belong to the classical world, and the first – object – to the microcosm where not applicable engraved in our minds communion with Nature classical concepts. And not exist and never will exist to avoid this paradoxical situation, because to describe the experimental results, we do not have anything else available. In particular, this paradox of Einstein put it: “I cannot believe that God plays dice!” The second conclusion concerns the fact that the measurement process creates a state of particles, which did not exist prior to its interaction with the device. However, it is with a person

who deliberately sets corresponding experiment! That is the process of measuring a person creates a particular reality – it works. Therefore, it becomes part of the reality from which it cannot be separated. This situation gives rise to the need to rethink the philosophical view of the nature of the universe, the place and role of man and his consciousness in the universe. The need to use to describe the micro concepts imposed by our macro has the consequence that the selection of individual parts of the triad object – conceptual information channel – the person is no longer in question. A person becomes an integral part of the outside world, and therefore the classical idea of objective existence independent of human consciousness becomes matter content.

Before turning to a brief overview of the concepts of Eastern philosophy (overview of concepts in different areas of Eastern philosophy are, in particular, in [3]), which is much closer to quantum concepts of the universe than is formed in the western world philosophical paradigm of separation of nature into two separate areas – realm of matter and the scope of consciousness. Recall that the language of quantum mechanics, like any other physical theory is mathematics. Mathematical toward quantum theory countless times experimentally tested and today it is an accepted description of the phenomena of the microcosm – a consistent and devoid of contradictions. However, as soon as it comes to attempts based on quantum ideas about the nature of the microworld a vision of the universe, there is solid ground on which there are “quantum” physics – pragmatists who do not care about philosophical construct, begins to escape from under his feet. Such attempts may be based on other philosophical paradigms, in particular, the inherent philosophy of the East.

First we recall the views of the ancient world and later period in Europe the universe.

Early Greeks (Miletus School) promoted monistic view of the world – there is no difference between living and nonliving matter (matter and spirit), all things are full of gods (Thales), the entire universe – the only body that has the “breathing space” (Anaksimandr). These views are very close to the views of the ancient Indian and Chinese philosophers. This similarity is most clearly manifested in the opinion of Heraclitus – all changes are the result of cyclic interactions of different pairs of opposites, each pair of opposites is a unit. What unites opposites, appears in Heraclitus as “logos”, which is above these opposites.

Separation of unity began in VI–V century BC. A school of philosophers Eleyi where by intelligent and personalized Godhead is above the world and governs it. Parmenides of this school believed that dealing with indivisible substance that has properties that can vary. This idea gave rise Levkip and Democritus conclude that this matter is indivisible totality very small further indivisible units of matter – atoms, connecting and dividing, give rise to any changes in the outside world. It was founded on the separation of spirit and matter. Matter is made up of entirely passive and lifeless atoms moving in a void. The reason their movement was associated with external forces that had perfect spiritual character and had nothing to do with the matter.

Once the idea of the separation of spirit and matter rooted, ancient philosophers became interested in spirituality, the human soul and problems of ethics. Their achievements systematized Aristotle, whose views are not questioned until the Renaissance. Once in the XV century an interest in nature, and began to expose experimental hypothesis testing. Finally, Galileo initiated modern science, when combined math and research. Later in Europe and took a look on the complete separation of nature into two independent components – field of consciousness and region matter what happened through the works of René Descartes. The result of this was the establishment section Cartesian mechanistic worldview, which allowed Newton to build his mechanics, which became the foundation of classical physics. The philosophy of Descartes was

not only important for the development of classical physics, but also created the entire Western way of thinking that prevails today. In this philosophy, man identifies himself with his mind, not with the whole body, sees himself as some “ego” that is “inside” the body “think, therefore I exist”. Cartesian mechanistic philosophy and the division contributed to the development of classical mechanics, electromagnetism theory and technology. The new physics of XX century overcomes the limitations of Cartesian division and returns us to the idea of unity expressed by the ancient Greek philosophers and what is the main core of the philosophy of the East. Here are the main points of philosophy of the East, which are most in tune with the philosophical aspects of modern quantum physics.

Unlike Western Cartesian mechanistic views, oriental philosophers look at all the objects and phenomena that sensually perceived as linked to different patterns – a single aspect of ultimate reality to which it belongs and is an integral part of every individual. Although religious philosophical movements, such as Hinduism, Buddhism or Daoism, have their differences, each of which respectively consist of a large number of closely related spiritual teachings and directions of the main features are similar. Often these doctrines are called “Eastern mysticism”. In the philosophy of the Western world can find many mystical, but this part has always been separated, while the mystical school of the East were the basis of most of his religious philosophical systems.

First, we note that the Eastern philosophy inherent in religion. They set a goal to directly perceive the mystical world that is part of religious practice. The strongest link between religion and philosophy inherent in Hinduism. Hinduism is neither philosophy nor religion in the ordinary sense of each. The source of the ideas of Hinduism are the Vedas – collections of works by anonymous authors. There are four collections of the Vedas, which are dated between 1500 and 500 B.C. For practical use Vedas embodied in various epics, popular remakes and legends that have absorbed a vast and colorful Indian mythology. The most common is epic Mahabharata, which in the form of conversations god Krishna and the warrior Arjuna second is guidance on the nature of the world. The main idea is such that a variety of things and phenomena that surround us, embody in themselves the same supreme reality called Brahman. This concept essentially monistic must be understood as “spirit”, the divine principle that is the inner essence of all things. Brahman – infinite and surpasses all possible representations. It cannot be taken wisely and adequately describe with words. On it is written in the Upanishads: “Elusive, higher soul unlimited, unborn, non-negotiable, does not allow thoughts”. Therefore, Hindus speak of this divine principle, using the language of mythology. Various aspects of the Divine are the names of various gods. However, there is no doubt that all of them – only one single realization of ultimate reality. Hinduism has its teachings form of myths, using metaphors, symbols, poetic images, comparison and allegory. Logic and common sense do not impose any special restrictions on the language of mythology. Himself Brahman – the great magician who transforms himself in all things, and vice versa, using the magical creative power. Therefore, all existing forms around us are relative, fluid, constantly changing. The driving force behind these changes is the karma that binds a principle of action, beginning and end. That karma does not allow us to act freely and independently entangles like chains, and gives us rid of a changing world that hides from us higher deity – Brahman. To understand it, to feel that everything around it is that it is only truth that exists, must be freed from all that flows and changes, and most importantly – to break the chains of karma. This condition is called «release» it is the main content of Hinduism. At the top of this content – the perception of Brahman as non-personified metaphysical concept, devoid of

any mythological content. "Liberation" reach mandatory daily practice aimed at merging with Brahman – the so-called meditation. One way this meditation known as yoga – conjugation, which means the connection of the individual soul with Brahman. There are several schools of yoga, which use a variety of exercise and, significantly, different psychopractice. For Hindus merging with the Divine is achieved, often through worship any of the gods, who is the embodiment and personification of certain properties of Brahman. Among them – the three most popular: Shiva – Cosmic Dancer, dance to the rhythm of breathing which pulsates infinite universe, Vishnu, whose function – to protect this universe, and Pits – Divine Mother, which displays his versatility embodies the feminine and the feminine energy of the universe.

We greatly to realize that all the diversity of Indian mythology gods with all their incarnations and reincarnations are manifestations of the same divine reality, various aspects of infinite, omnipresent and highly unattainable by reason of the Godhead-Brahman.

If Hinduism priority given to mythology and rituals, in Buddhism – Psychology. The emergence of Buddhism owes to man – Siddharta Gautama, who later received the name of Buddha. He lived in the middle of the VI century B.C. in India. Note that in this century also lived and worked Confucius and Lao Tzu in China, Zoroaster in Iran, Pythagoras and Heraclitus in Greece. Buddha was interested in, mainly, human life with its sufferings and disappointments. He described the causes of suffering and how to overcome them. Using the already traditional concepts of Hinduism, such as karma or nirvana, he gave them not only a new psychological interpretation. One of the main areas of highly intellectual and Mahayana Buddhism – "Great Vehicle" – rejects abstract reasoning and intellect considers only one of the ways to help clear the way for direct mystical insight, which was called "awakening". Main content of awakening is to leave the world of intellectual distinctions and dichotomies and be in the world after mental, indivisible and undifferentiated "this". Being in a state of deep meditation, he felt a perfect state of absolute awakening when all the previous considerations, the search and doubts have lost their meaning and value. That is why this man is given the name Buddha, meaning "awakened".

His enlightenment the Buddha described as four noble truths. The first argues that human existence is characterized by frustration and suffering. Frustration has roots our unwillingness to acknowledge the obvious fact that everything around us is transient. "All things appear and disappear", – said the Buddha. Suffering occurs when a person begins to lean flow of life and wants to keep something steady, unchanging – is this things, events, people, or thoughts when she does not want to realize that "it", "I", or anyone else, or something else – fixed and unchangeable – there is.

The second explains why the truth of suffering, which is our attachment to life and all its manifestations, which generated confusion. A misunderstanding is that we are trying to divide the world who perceive by the senses, the separate and independent parts, and in this way to implement mutable reality in the form of fixed categories of thought. When we think so, we are waiting for the disappointment created a vicious circle, which turns as births and deaths are the driving force – karma – a continuous chain of cause and effect.

According to the third truth can stop the flow of pain and frustration, to escape from the shackles of karma and achieve complete liberation, which is called nirvana, a state that cannot be described as something more, because this state is beyond intellectual concepts. Attain Nirvana – then wake up, enlightenment become Buddha.

The fourth noble truth identifies how to eliminate suffering. To do this, follow the path of Eight steps. The first two lead to a proper understanding of human life, the following four – these



are rules that define this way – it must be equidistant from opposite extremes – the middle way. The last two steps lead to a correct understanding, correct meditation and direct mystical perception of reality – the final and ultimate goal of the Path.

The followers of the Buddha advocated opinion, in which concepts are used by people to describe the perception and reality have limited capacity, so the real world cannot comprehend the concepts and reasoning. Therefore, we must recognize that conceptual thinking is useless, and the concepts of human thought empty and devoid of absolute meaning, then reality itself becomes void, which is not as non-fill as the sole source of all life and the only meaning of all observable.

Condition that it reaches the displacement from the minds of conceptual thinking – this is the state of Buddha or the state of absolute truth – Nirvana – Knowledge of the true Void. Reach Nirvana meditation or contemplation. Condition nirvana occurs when movement through the mind's consciousness feels his own presence in the Void. Once this state is called Dharma – a true condition, the feeling of unlimited space enlightened consciousness. Dharma means the teachings of the Buddha. Dharma is guided to understand the four noble truths. Dharmakaya – one of the three bodies of the Buddha – his mind, two others – his language and his body. Dharma – the body without form. Sign in to Buddhahood means to master his mind – enlighten.

Buddhism penetrated into China in the first century B.C. and collided with a culture which numbered about two thousand years. Since the early Chinese philosophy developed in two directions. One of the areas of remarkable interest in social life, moral values and management. Other – born mystic side of the Chinese character, according to which the supreme goal of philosophy should be above the elevation of human society and everyday life and achieving a higher level of consciousness. This level of sage, so the Chinese call their ideal enlightened person who has attained mystical union with the universe. In the VI century B.C. these two directions of Chinese philosophy developed in two distinct schools of philosophy – Confucianism and Daoism. Confucianism – the philosophy of social organization and practical knowledge. In Daoism, above all, valued contemplation of nature and her ways of understanding or Dao. According to the Daoism, one becomes happy when observed natural order, acting spontaneously and trusting intuition. These two opposing schools have always treated the Chinese as components that complement each other. From these two lines is the philosophy of Daoism mystical orientation, and therefore interesting to compare with modern physics. Like Hinduism and Buddhism, Daoism prefers intuitive wisdom rather than rational knowledge. Recognizing the limitations of rational thinking and the relativity, Daoism offers to get rid of rationalism, and so it can be compared with Vedyzm in Hinduism or with through eight steps in Buddhism. The Chinese, like the Indians thought that there is a higher reality, which is based on a variety of things and phenomena observed by us, and combines them into a single. This reality is called the Dao, which primarily means the Way. This is the way the whole world, the order of its structure. Dao also means the way that you can understand the knowledge about the world, about our spiritual journey and about ourselves. Sometimes the word is used in the sense of the source of all things, the source of life, or some fundamental force that permeates the entire matter of the universe. Dao is akin to the concepts of Brahman Hindu or Buddhist Dharma. However, Dao differs from them vibrant core, which, according to Chinese characteristic throughout the universe. Dao – the cosmic process which involves all things and because the world is constantly changing. Chinese believing that fluidity and variability inherent throughout the universe, nevertheless were convinced of the existence of some stable patterns or images, cohesiveness with which these changes occur. What are the

persistent and repetitive patterns of cosmic Way? First of all it is – infinite cyclic movement and change. “Movement Dao is returned. Go away – then back”, – said Lao Tzu, author of the famous Daoism treatise “*Dao de Ching*”. The concept of cyclical patterns that are in motion Dao found expression in the famous image of two polar opposites – Yin and Yang – Chinese Tai Chi symbol – a symbol of limits. Yang, reaching their peak of development, retreats to the yin, and vice versa. Symbolism couples Yin Yang is a fundamental concept of the whole Chinese philosophy. Ian – a strong man, creativity, associated with the sky, yin - the dark, feminine, receptive and maternal beginning – with the Earth. In Tai Chi Yang symbol – part of light, yin – symmetric it is dark. Two points in the symbol indicates that when one of the principles of peaks, it is ready to retreat and contains the germ of opposites.

Taoists consider all natural changes as the dynamic alternation of Yin and Yang and realize that any pair of opposites is a dynamic unity. For us, the people of Western philosophy may look paradoxical is the fact that feelings and qualities that we believe the opposite, and therefore incompatible, are actually aspects of the same phenomenon. In China, an idea of the unity of opposites and the relationship is based on Daoism philosophy. The fact that the movement of the Dao is the interaction of opposites which successive one another, served as the formation of two Taoist rules of conduct: if you want to achieve something, start with its opposite, for example, to reduce something, you must first enlarge, to take, one must first give; to weaken, you must first provide the power. The second rule states that to save something must make it its opposite, for example, be blank and stay full, any curved, elongated and stay. These rules guided by the sage who has attained a high level of insight. So he does not seek good and tries to maintain a balance between good and evil, otherwise it will go against the flow of Dao.

Recall that this doctrine of opposites, Heraclitus taught in Greece at the same time as the attitudes of Daoism in China. Greek “*Daoist*” – Heraclitus of Ephesus – not only maintained a continuity of change, but they outlook repeatability. According to him, the world order – is eternally living fire that inflames it, it goes out, which is close to the concept of Dao. Heraclitus recognized polarity of opposites, and thus their unity: “Way down the road and up – is the same”, – he argued. The similarity of views of Heraclitus and Lao Tzu and that those – mystic by nature.

When some in the first century B.C. Indian Buddhism penetrated into China, it has led to extremely effective ideological exchange that led to the emergence of a new trend of Buddhism, which reached the sophistication and completeness later on the field of Japanese traditions and worldview. This area is called Zen or Zen. Zen followers are aiming, similar to that which the Buddha sought – to achieve enlightenment, feeling that the philosophy of Zen is called “*satori*”. The experience of “*liberation*”, “*clean*”, “*enlightenment*” – highlights in all schools of Eastern philosophy, but to achieve the Zen *satori* is the essence of Zen and does not require any interpretation or explanation. Stronger than any school of Zen mysticism of the East proves that no words can express the highest truth. Every thought in the usual sense as a sustainable concept for Zen Buddhist wrong.

Thought is a sequence of words, but no words Zen: if you have reached *satori*, you just achieved. *Satori* may be defined as an intuitive penetration into the nature of things opposed to analytical or logical understanding of nature. *Satori* mean that the entire world is in a completely unexpected angle – all contradictions and opposites harmoniously combined into one single organic whole. Achieving *satori* – a restructuring of life itself, the whole spiritual revolution that creates a new person. In the Christian religion something similar called «conversion». But here we are dealing with emotions quickly, whereas in the case of *satori* – wisely.



Teachers zen found ways to help their students understand the truth of Zen. These methods are designed to have the students create a state of mind, which could lead to enlightenment, or, in other words, a kind of its collapse, when all the achievements gained mind instantly destroyed.

One way is called the method of “koan”. During Koan understand the paradoxical question, statements or actions of the teacher. In a paradoxical whole point koan. They serve as a subject for meditation, they are so diverse, ambiguous, irrational, that no one can predict what will be its solution. Also rejected any rational connection Koan of experience, and that the «correct» answer in any case cannot be proved logically, the koan method does not impose even the slightest restriction on the freedom of spiritual discovery, is based solely on individual inner attitude of the student and does not contain any intelligent component.

The essence of satori that opposes the unconscious nature of the student or teacher koan answer found as a result of the destruction of the rational intellect. Unconscious – a combination of concealed psychophysical factors and of itself is not able to identify. It is something that carries a potential of consciousness which occasionally draws fragments. If consciousness as far as possible devoid of any meaning, then it goes into unconsciousness. In this case, the energy of consciousness is not directed at restoring its contents, and transferred to the concept of emptiness or koan. In this case, energy is released which becomes unconscious and enhances its capacity to a level where unconscious content ready to break into consciousness. The subconscious then brings to the surface all that is necessary to complete the structure of conscious. If in this case the unconscious harmoniously embedded in the structure of consciousness, the result is this transformation of mind in which disappears conflict between the conscious and the unconscious.

To deliberate is characterized by decoupling into separate parts, one-sidedness, fragments. The response from the unconscious has the character of completeness, the existing nature that has not work out consciousness. The effect of such a breakthrough in consciousness is sudden, total, universal perceived as liberation, as startling discovery after consciousness itself stuck in gridlock.

The result of satori is to achieve completeness, becoming whole, and that is what matters most to the East. Satori – a single learning object context and unity with the pervasive reality that lies behind it. One of the teachers in this context zen said: “When you reach satori, you will be able to see the palace of gems on one blade of grass, but if you have not experienced satori, the palace itself is hidden from you by a simple blade of grass”. This is the most important thing in Zen Buddhism.

Despite the differences of various philosophical and religious areas of the East, it is advisable to pay attention to what they have in common that unites them.

The most prominent, the most important feature of the outlook in the philosophy of the East its essence – an awareness of unity and interconnectedness of all things and phenomena as manifestations of perception alone. All things, including man, viewed as interrelated and inextricably linked parts of this cosmic whole, as different manifestations of the same ultimate reality. In Hinduism it is called Brahman, in Buddhism – Dharma in Daoism – Dao. This ultimate reality is beyond any concepts and categories.

In ordinary life, we are not aware of this unity, dividing the world into separate objects and events. This separation helps us navigate in our daily environment, but it is not a fundamental property of reality itself. The separation generated by our intellect, which is inherent feature to divide and create categories, notions and concepts. As the reality of our concepts of individual things and events, the mysticism of the East evaluates them no more than an illusion.

Returning to the concepts of quantum microworld, we recall that there some material objects of classical physics are converted to probabilistic schemes that reflect all possible states and all possible channels of their interactions and interconversions. Quantum theory makes to look at the world not as a set of physical objects as well as the net of relationships of different parts of a whole – so experience the world oriental mysticism and individual expression are almost identical with the words of physicists in Europe.

In particular, to quote philosopher Aurobindo Injun:

“... Material object is transformed into something different from what we see before us at any given moment, as an independent object against a background or surrounded by the rest of nature as an integral part of a complex and revealing the unity of all that we see” [1].

But Heisenberg expression:

“... The world appears to us as a hard tissue in different events, in which connections of different types of alternating overlap one another or combined, defining in this way a structure...” [3].

Interlaced image space mesh is widely used in Eastern philosophy to describe the mystical perception of nature. Hindu Brahman – the main thread, space net of Indra, the foundation of all things. Tibetan Buddhism outlined in the so-called Tantra, which means “to weave” – the name suggests interconnection and interdependence of all phenomena and things. In eastern mysticism universal interconnection always covered man with his mind, as it is in quantum theory. In atomic physics we cannot talk about the properties of the object as such. They acquire meaning only in the context of object interaction with an observer. It is worth quoting Heisenberg: “... Natural science does not simply describe and explain natural phenomena, is part of our interaction with nature”. And: “... something with which we are dealing, it is not nature itself, it is nature that is available to our method of asking questions” [3]. In the process of quantum measurement scientist decides which way it will build an experiment, and depending on what he decides will be received not only one or the other characteristic properties of the observed object will also be formed such properties, which are caused by the specifics of a particular experiment, planned researcher. As in nuclear physics scientist is not a bystander, he observed it becomes part of the world so much that he affects the properties of the observed objects. The idea of “participation instead of observation” in quantum physics emerged relatively recently, but it has long been characteristic of the eastern mysticism. The term “member” is a key in the mysticism of the East. There observer and observed, subject and object are not only separated, but merge into a single, when they can no longer discern.

Of course, physicists working in other circumstances and avoid going deep into the experience of unity of all things and phenomena. However, the theory of the atom is already a big step toward mysticism. Quantum mechanics rejected the idea of objects as independent of one another, made an observer member of the microcosm of events, and at this stage already needs to include a description and the human mind. Buddhist Govinda as suggested, in tune with the philosophy of atomic physics: “... Buddhists do not believe in the existence of independent or self-world dynamic forces which act on humans. For him, the outer and the inner world of his soul – a whole two sides of the same matter in which the threads of all forces and all phenomena, all forms of consciousness and their objects caught in the net undivided endless, mutually conditioned restored” [5]. Another aspect of the unity of the world in the outlook of the East associated with the concept of the unity of opposites, most clearly expressed in the Daoist Tai Chi symbol – the alternation of yin and yang. One of the highest goals of human spiritual traditions of the East – to realize that all of polar

opposites, i.e., single and inseparable. No good without evil, no darkness – light, no life – death. Since all opposites are interconnected, their struggle cannot be completed victory of one of them is merely a manifestation of their interaction. This interaction means between opposites cannot fixed static balance, but a dynamic alternation of two extremes.

In atomic physics we find a similar situation when we talk about the so-called kurpuskulyarno-wave particle duality, which applies to all microscopic – and those of classical physics with the status of the field, and those that are designated as particles. Duality of particles and radiation, when the first cases in the relevant act like waves, and some – like particles, created a kind of “quantum koan”, because classical physics does not admit the existence of the same object in mutually exclusive ways. Quantum theory describes the natural association of waves and particles in an object, thanks to the description of its language of probability. With the emergence of probability solved the paradox of wave – particle, but moves the problem in a new context in which there is a new pair of opposite concepts – the existence and non-existence. Such opposition is far more global. We cannot say that atomic particle exists in a particular point in space, and we cannot say that there is none. That is, we cannot describe the particle in terms of one of opposites, because the particle is not in the specified point and are not available there. It does not move and is not at rest. Merely changing the scheme of probability! Thus, the world is beyond the narrow limits of opposites in perception as atomic physics and Eastern mysticism.

To describe the world microparticles is very important theory of relativity, which first united the separate space and time into a single four-dimensional space – time, in this case led opposition beyond concepts such as after – closer – on, above, below, right-left. Physicists accept four-dimensional space – time using the language of mathematics, but their ability to sense perception confined to the three-dimensional space and time separately. It is therefore quite easy to accept the reality of four- relativistic physics.

Create mechanics of particles moving at high speeds, has led to an important discovery – the equivalence of energy and mass. The formula combining their simple and concise:

$$E = mc^2.$$

In classical physics, each of these realities exist by itself and each is subject to its conservation law.

Energy has many different incarnations – the energy of motion, thermal, electromagnetic, chemical, gravity. Whatever form it means the ability to do work. Energy can change form, but cannot terminate its existence.

Weight in classical physics is a measure of its weight, i.e. gravitational interaction. There is a measure of resistance to acceleration that determination outside. It is associated with the notion of some material substance from which all bodies are composed. It cannot disappear and appear out of nothing.

The theory of relativity states that mass is nothing more than a formula of energy. That energy is not only can take different forms, but “preserve” in the body weight, the amount of which is determined by the Einstein formula. As a form of energy, it loses its property non-annihilate and can be converted into other forms of energy, including a lot that happens when subatomic particles. In these collisions, also called reactions, some particles may cease to exist, and the energy that was contained in their mass is converted into kinetic energy and redistributed between other particles that have emerged in response. That is, when a collision is very fast particles their kinetic energy can lead to the emergence of new particles and go to their mass. The appearance and

disappearance of material particles – one of the most striking manifestations of the equivalence of energy and mass. Weight losing the property to be “material”, it describes the presence of an object of a certain amount of energy. Energy is inextricably linked with the work processes, i.e. micro particles have a higher degree of dynamic nature. This nature makes sense when seen in the context of particle four-dimensional world of relativistic mechanics. Subatomic particles – a dynamic structure, each with characteristic spatial and temporal aspects. The spatial dimension gives them properties of objects that have mass, and time – the characteristics of the processes in which the available energy is equivalent to their weight. We cannot separate the particles from the process, this unity is generated, and hence related to the four-dimensional space-time continuum, which leads to a description in terms of particle energy, work and processes. We do not have anything that resembles a body of classical physics, and are dynamic patterns which are constantly transformed and modified – are performing a dance of energy that has no end. These findings are deeply in tune with the views of mystics of the East, who see the world is not the way objects and processes – an endless stream of changes and modifications.

Experience that physics was in the union of one-dimensional three-dimensional space and time into a single four-dimensional continuum indicates the way in which physics today is moving towards a unified field theory. First, we note that the construction of relativistic quantum mechanics, quantum mechanics is based on the theory of relativity led to the discovery of antimatter, which respectively led to the need for a new way to understand time itself. When particles of matter moving in time, the corresponding antimatter particle moves “against time”. The same mathematical expressions, such as describing the motion of the positron time forward motion of the electron in time back. Space and time are equivalent in the sense that the interaction of subatomic particles can be deployed in either direction of time. Processes in the subatomic world get rid of the feeling as if the direction of time, and therefore lose the contents of causation.

If you return to the mysticism of the East, we find there the statement that meditation allows you to overcome the web of time and find oneself in a world where there are no reasons or consequences. Because eastern mysticism called “liberation from time”. This definition is in some sense may apply and relativistic physics.

It is clear that in reality the observer cannot perceive events differently than in the form of a sequence of different episodes in time. That is, from the mathematical description of phenomena in an abstract four-dimensional space-time we have to go to their projections in the usual space and time of classical physics, and therefore analyze the world within a limited narrowed perception that losing the integrity of the phenomena that exist in spaces of higher dimension.

Today theoretical physics in trying to unite all the phenomena of nature as a whole, applying their mathematical description of the so-called hyperspace. Very encouraging attempts such a description using *odynadtsyatyvymirnyy* space. However, we probably will never get rid of the shackles of the classical one-dimensional three-dimensional space and time, and therefore will have to build bridges to move from the mathematical description of *odynadtsyatyvymirnomu* space to three-dimensional measurements in our macrocosm, which themselves belong. Understand the world at hyperspace we might be able to if the procedure to eliminate measurement device as conceptual information channel and surrender to the grace of meditation!

*Author's translation of the article*

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